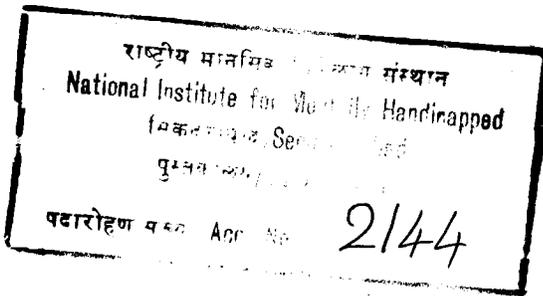

TEACHING RETARDED
LEARNERS
Curriculum and Methods
for Improving Instruction

John Langone
University of Georgia

ALLYN AND BACON, INC.

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*This book is dedicated to the mentally retarded learners I have worked with.
You are a constant reminder of what special education is really about.*



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A NOTE ABOUT THIS BOOK

■ Special education teachers are “special” to the extent that they are flexible and pragmatic—so states the theme of this book. The subject is the design of innovative curricula and delivery of effective instruction for learners with mild to severe retardation.

The heart and “specialness” of this book lie in Chapters 3 through 7:

- Assessing students to find skills and deficits.
- Monitoring students’ behavior in relationship to the IEP.
- Modifying curriculum as needed.
- Utilizing behavioral principles and strategies of instruction.

Chapter 7 involves the aspect of curriculum development beyond the IEP. Objectives identified in the IEP are translated into the lesson plans of teachers’ everyday lives. Also, and most importantly, the chapter serves as a “hinge” for the book as it sets the stage for the application of curriculum development and effective instruction to the separate curriculum areas of the book’s second half, such as:

- Reading and written expression.
- Arithmetic.
- Independent living skills.
- Communication.
- Leisure and recreation programs.
- Career and vocational programs.

Finally, please note key pedagogy designed to provide emphasis and understanding: *Key Concepts, The Idea File, and Case Studies.*

Jeff Johnston
Series Editor

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■ I began to conceptualize this textbook when a regular educator attending a workshop I was presenting asked me, "What makes special education teachers so special?" After a good deal of throat clearing I began to recite a list of prepackaged competencies commonly known to all teacher educators.

My answer did not satisfy this teacher and he continued by stating, "I never did see what teachers of retarded kids did that was any different from what any good elementary school teacher does!" On the drive home I wrestled with this teacher's statement because it had awakened memories of old arguments; arguments questioning the efficacy of special education.

Those arguments suddenly began to become real. In my daily visits to classes for retarded learners, I found many inconsistencies between existing and preferred teaching practices. On the one hand, professionals seemed to want retarded students to become as independent as possible by acquiring skills that allowed them to live on their own, be good consumers, work productively, and spend their leisure time fruitfully. The philosophical base of special education appeared to center around the community and the role that a retarded learner can assume as an integrated member.

On the other hand, in many classes I found mildly retarded students spending their entire day in small rooms attempting to memorize facts that their regular education peers learned last year. Along similar lines, moderately and severely retarded students were being asked to learn pre-academic skills because, based on their developmental level, someone decided that those skills were appropriate.

Fortunately, since my encounter with that sagacious teacher, special educators across the country have and are continuing to develop programs for retarded learners that are "special" in the sense that they are more pragmatic. Increasingly, the community is being seen as an extension of the classroom because that is where retarded learners will live, work, and play. Curriculum is changing to reflect a "common sense" approach that includes teaching skills that are valid in sites where people are required to purchase items, eat, make products, converse with others, and perform countless other independent living skills.

This approach to teaching retarded learners is having a profound influence on the skills special educators must have to be effective. If the same question concerning the "specialness" of teachers confronted me today, I would dispense with the professional jargon, discussing instead how special educators are good assessors of students, using a variety of techniques not resulting solely in scores, but in a detailed list of students' skills and deficits. Special educators are also good at monitoring students' progress frequently (often daily), changing curriculum, methods, and materials, if the students are not learning.

Most importantly, special educators are courageous and flexible. The classroom is a relatively safe and secure environment and it requires courage to leave that safety and teach in locations not traditionally considered "schools." The teacher who takes small groups of mildly retarded students to grocery stores to learn consumer skills and one who teaches bus-riding skills to severely retarded learners on a city bus, are under the watchful eye of a skeptical public.

Special educators are increasingly being asked to be more flexible, teaching skills and assuming roles that may be temporarily foreign to them. I am often surprised to note the expressions on the faces of my students when I tell them they may have to teach retarded learners the reading and measurement skills needed to work in an agribusiness or to teach skills necessary to be good custodians. They look at me with incredulity when I talk to them about being better managers, effectively scheduling volunteers and peer tutors while also seeking community resources and environments where instruction can occur. Once the initial shock has worn off, however, the energy and effort they put into being good at their changing roles, a true test of their flexibility, have never failed to amaze me.

Audience and Purpose

This book is intended for use by both preservice and inservice teachers at either the undergraduate or graduate level. It emphasizes preferred practices for both curriculum and methods of instruction for all retarded learners, mildly to severely handicapped.

To some, the scope of this book may seem broad. A close inspection of teaching strategies, however, reveals that the techniques found to be successful are generic and equally applicable to all content areas. The instructional techniques used to teach a mildly retarded learner reading skills are the same as those used to teach a severely retarded learner to assemble a complex industrial product or to brush his teeth (e.g., verbal instructions, modeling, guidance).

Likewise, curriculum is generic across the severity levels of retarded students. Mildly to severely retarded learners must be taught to read and compute and they must learn vocational, communication, and leisure/recreation skills. Although capacity and sophistication of learning differs from learner to learner, all students can find some success in each area of the curriculum.

This book is unique in the sense that examples of methods and curriculum are presented in relation to all severity levels of retarded learners. The strategies and curricular examples are based on various research efforts and I have tried to translate these efforts for the practical world of teachers. With this goal in mind, each chapter contains sections labeled *Key Concepts*, *Idea File*, and *Case Studies*. These sections highlight some of the preferred practices and most important considerations found in each chapter. In addition, the chapters on the specific curricular areas present information on how microcomputers can be used effectively in teaching retarded learners.

As the field moves into the last half of the 1980s, special educators will be

learners they teach. The emphasis is on *transistion* from school to work and daily living so teachers will no longer be able to say goodbye to students when they leave our programs. Our concern for them will continue throughout their lives and everything we do as teachers should contribute to making their transistion a positive one.

Acknowledgments

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EDUCATING THE MENTALLY RETARDED: AN OVERVIEW

■ An interesting and informative exercise for students in the field of mental retardation is to conduct an informal survey of attitudes toward intellectually handicapped people. For example, they might ask community members to speak the first word that comes to mind when they hear the term "mentally retarded." A majority of the responses would probably fall into two distinct categories: (1) words representing attitudes based on fear (e.g., "crazy," "weird," "different") or lack of knowledge and (2) words representing paternalistic feelings (e.g., "help," "shelter," "care," "protect"). Words such as "independent," "productive," and "neighbor" will probably be used the least, if they are used at all.

These results, although speculative, are indicative of a paradox existing in society today. On one hand, some parents, advocates, and professionals are striving to create more community based options for mentally retarded citizens and to develop an air of enlightenment toward these individuals. Conversely, there have been instances in the United States where group homes for the retarded have been victimized by arson or where citizens have attempted to change zoning laws in order to prevent the opening of these residences in their neighborhoods.

On the whole, society has made great strides in the care and treatment of the mentally retarded. Generally, most people would no longer wish to allow beatings, starvation, and wholesale warehousing of retarded people, while at the same time, they may not be convinced that the retarded should be integrated into the community. In contrast to these prevailing attitudes, there have been many instances when the capabilities of retarded people have been demonstrated. The goal, then, is to help current practices catch up to existing knowledge, a task that should be directed toward some professionals and the community at large.

HISTORICAL DEVELOPMENT OF ISSUES IN MENTAL RETARDATION

Early Practices

Early history provides an excellent example of how retarded or other handicapped persons were exploited or became victims of cruel practices. For example, the Spartans of Greece believed that only the strong should survive; therefore, they abandoned anyone who was handicapped (Kanner, 1964). The Romans, on the other hand, found the retarded to be amusing, and many families of the ruling class kept such people in their homes as court jesters, a practice that continued into the early history of both France and Germany (Kanner, 1964).

During early times, Christianity began to play an important role by providing more humane approaches to the care and treatment of the mentally retarded. Unfortunately, these practices were not widespread, and during medieval times treatment ranged from tolerance to persecution (Doll, 1962; MacMillan, 1983).

The pattern of change in the treatment of the mentally retarded continued over the years like a swinging pendulum (Burton, 1976). In some instances retarded individuals were treated like innocent children and were cared for paternalistically; in other instances they were treated as disciples of the devil and were persecuted, often to the point of death (Kanner, 1964).

During the late eighteenth century and into the nineteenth century, some of



Many of today's curricular programs reflect the five training objectives developed by Itard. (Courtesy of DLM Teaching Resources, Allen, Texas)

the first attempts to educate handicapped persons were made. Jean Marie Itard (1774–1838), a medieval doctor, greatly influenced the field of special education through his work with a feral (wild) boy, who was found in the woods near Aveyron, France. Victor, known as the Wild Boy of Aveyron, exhibited little or no social behavior when found, and was unable to communicate. Itard believed that through systematic training Victor's mental deficiencies could be eliminated (Kanner, 1964). The program that Itard developed was based on five objectives addressing the following areas: social skills, sensory stimulation, knowledge of his environment, communication skills, and general academic skills.

Interestingly, all five of these areas can be found firmly embedded in many of today's curricular efforts for the retarded. Itard, however, after working for five years with Victor, gave up in disgust, feeling that his efforts to "civilize" the boy were unsuccessful. Unfortunately, Itard failed to realize the great strides that he had made with Victor. He set a precedent in educating severely handicapped individuals by creating interest in the area and developing one of the first systematic sets of instructional procedures for teaching skills such as self-care and communication. The program objectives and instructional strategies he designed can be found in use today.

Itard's initial optimism for the intellectually impaired was abandoned in the late 1800s and replaced by a mood of pessimism. Professionals began to feel that the retarded could not benefit from treatment. This mood of pessimism increased, and by the beginning of the twentieth century, society wished to see the retarded segregated, fearing that they were a potential menace. Thus, for the first part of the twentieth century, training the mentally retarded to return to the community was not a primary goal.

More Recent Developments

The period between 1930 and 1950 saw a decline in the alarmist spirit, but the plight of the retarded during this period remained basically the same: one of institutionalization. After 1950, however, professionals began to take more interest in mental retardation. Menolascino (1977) identified a number of events that caused this resurgence of interest.

First, diagnosis of the causes resulting in mental retardation focused on the differences between the retarded and the mentally ill. Second, research efforts in medicine, education, and psychology drew more interested people into the field who wished to study the behavior of retarded people. Finally, parent groups such as the Association for Retarded Children (known today as the National Association for Retarded Citizens, or NARC) provided the impetus for increased awareness and program development.

As more parents, professionals, and others attempted to develop additional educational programs for the retarded, the federal government began to take an active role in these endeavors. In the early 1960s, President Kennedy made a strong appeal for special education program development and appointed a panel to study the problem. This attention by the president provided a tremendous boost to the

field of special education and marked the beginning of a trend toward increased involvement at the federal level.

Landmark court decisions in the early 1970s, initiated by parents and professionals, spurred federal legislators to enact a number of laws designed to protect the rights of the handicapped and provide monies to stimulate research and new program development. Unfortunately, up to this period of time the public had, in effect, forgotten that retarded people existed. State institutions had become warehouses for the mentally retarded—places where treatment was for all purposes nonexistent and abuses to personal dignity and, in many cases, health were prevalent (Blatt & Kaplan, 1966).

Present-Day Issues

Since the 1970s great strides have been made in care, treatment, and education for the mentally retarded. However, many problems still exist that will require some resolution over the next decade. For example, the issue of whether or not parents have the right to withhold medical treatment from defective newborns has created a national controversy (Soskin & Vitello, 1979). An Indiana state court ruled that the parents of a Down syndrome infant had the right to withhold their consent to surgery that may have saved his life ("In the Matter of Treatment and Care of Infant Doe," 1982).

After the infant's death, public outcry prompted the Reagan administration to issue regulations under the Rehabilitation Act of 1973, Section 504, stating that no handicapped citizens were to be excluded from federally supported programs based on their handicaps. The regulations required that individuals aware of cases where treatment was being withheld were to call a toll-free hotline and report the violation.

The American Medical Association subsequently filed a suit against the federal government based on the belief that these regulations hindered the relationship between physicians and the families they advise (Vitello & Soskin, 1985). The court ruled against the government, and the regulations were rescinded.

Similar cases have continued to create public debate. In *Weber v. Stony Brook Hospital* (1983) the parents of an infant called Baby Jane Doe were allowed to withhold treatment that would have prolonged her life. The federal government attempted to intervene but was denied a hearing by the Supreme Court.

These and other cases create many questions. The question of what a child's life would be like if he were provided treatment that prolonged his life is important. For example, in the case *In re Phillip Becker* (1979) parents of Phillip, a 12-year-old boy with Down syndrome, refused to permit him to have heart surgery that would prolong his life. After various legal efforts, a California court awarded legal guardianship of Phillip to a surrogate family (Herr, 1984). Recent reports indicate that Phillip is progressing well in his new home (Vitello & Soskin 1985).

A major issue appears to be how best to educate the public concerning the ultimate functioning level of retarded children if they are exposed to quality educational programs. Professionals can help by developing effective teaching

programs that allow retarded learners to become highly visible in community environments.

DEFINITION AND CLASSIFICATION OF THE MENTALLY RETARDED

Society uses labels and definitions to identify people in need of specific services. This approach has some merit, if used correctly. Certain definitions can identify people who are mentally retarded (particular mildly retarded) and assist them in obtaining services.

There are many definitions of mental retardation. Each is unique in the sense that elements of it result from the philosophical viewpoint of its authors.

Historical Definitions

MacMillan (1983) has identified three categories of definitions of mental retardation: biological, social, and psychometric. The first category, biological definitions, was influenced by the medical profession and included components such as diseases affecting the central nervous system and incomplete cerebral development.

Proponents of social definitions viewed mental retardation in terms of societal issues and the effects resulting from the interaction of the mentally retarded with their environments. These approaches were directed mainly at the mildly retarded and attempted to demonstrate that retardation was primarily a function of the environment in which a person lived.

The psychometric definitions resulted directly from the development of intelligence tests. Their ease of administration and the fact that intelligence tests could compare individuals to the so-called normal population made psychometric definitions popular. IQ scores in such definitions became the sole determinant for classifying a person as mentally retarded. There are numerous critics of psychometric definitions, particularly because of the adverse effects of such definitions on minority populations, but this has not stopped the approach from becoming popular. In many areas the intelligence test score is still the prime determinant for identification and placement of children in various educational environments.

Definition

The definition adopted by the American Association on Mental Deficiency (AAMD) is the one most used by educators and, at the present time, is the most comprehensive. This definition has evolved through a number of revisions over the years, with the last three occurring in 1973, 1977, and 1983. The 1973 definition was incorporated in the Education for All Handicapped Children Act of 1975. (P.L. 94-142).

In the 1983 revision of its *Manual on Terminology and Classification in Mental Retardation*, the AAMD defined mental retardation as “. . . significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period” (Grossman, 1983, p. 11).

The manual also presented additional criteria explaining the following four components of the definition:

1. *General intellectual functioning* is operationally defined as the results obtained by assessment with one or more of the individually administered general intelligence tests developed for that purpose.
2. *Significantly subaverage* is defined as IQ of 70 or below on standardized measures of intelligence. This upper limit is intended as a guideline; it could be extended upward through IQ 75 or more, depending on the reliability of the intelligence test used. This particularly applies in schools and similar settings if behavior is impaired and clinically determined to be due to deficits in reasoning and judgment.
3. *Deficits in adaptive behavior* are defined as significant limitations in an individual's effectiveness in meeting the standards of maturation, learning, personal independence, and/or social responsibility that are expected for his or her age level and cultural group, as determined by clinical assessment and, usually, standardized scales.
4. *Developmental period* is defined as the period of time between birth and the 18th birthday. Developmental deficits may be manifested by slow, arrested, or incomplete development resulting from brain damage, degenerative processes in the central nervous system, or regression from previously normal states due to psychosocial factors.*

The concept of adaptive behavior has caused much controversy among professionals in special education (Clausen, 1972). On one hand, professionals believe that a person's ability to function in society is a better measure of competence than an isolated score on a standardized intelligence scale. Conversely, the lack of objectivity currently inherent in the measurement of adaptive behavior may weaken the argument for its use.

When analyzing the skill areas that comprise what is considered adaptive behavior, it is difficult to dispute that these skills are vital for an individual's survival in society. Grossman has classified adaptive behavior into three areas:

During infancy and early childhood in:

1. Sensory-motor skills and development
2. Communication skills (including speech and language)
3. Self-help skills

* From *Classification in Mental Retardation*, H.J. Grossman, Ed., 1984, p.11. Washington, D.C.: American Association on Mental Deficiency. Reprinted by permission.

4. Socialization (development of ability to interact with others)

During childhood and early adolescence in areas 1-4 and/or:

5. Application of basic academic skills in daily life activities

6. Application of appropriate reasoning and judgment in mastery of the environment

7. Social skills (participation in group activities and interpersonal relationships)

and

During late adolescence and adult life in areas 1-7 and/or:

8. Vocational and social responsibilities and performances (Grossman, 1983, p. 25).

Accurate measurement of adaptive behavior is important and yet very difficult. It is especially crucial for borderline cases where an appraisal of adaptive behavior may be the only criterion standing between a child and the label *mental retardation*.



KEY CONCEPTS



Society has moved from isolating retarded individuals in state institutions supporting an "out of sight, out of mind" philosophy to a better understanding of the need to bring retarded people back to the community. There are still problems that hinder a smooth transition, but community members in general are becoming more aware of handicapped individuals and their needs.

- Definitions available for classifying a person as mentally retarded are many and reflect different viewpoints.
- One of the more popular definitions of mental retardation was developed by the American Association on Mental Deficiency (AAMD) and includes psychometric, biological, and social criteria.
- When an overly representative number of minority children are classified as mildly mentally handicapped, it is possible the school systems are relying too heavily on the psychometric portion of a definition (Huberty, Koller, & Ten Brink, 1980). Some intelligence tests used to establish IQ scores have been found to be culturally biased, thus not providing a true picture of a person's abilities.
- Using measures of adaptive behavior allows professionals access to additional information concerning a person's functioning level in the community (Witt, 1980). If a person's adaptive behavior is considered normal, there should be some question as to whether the label "mentally retarded" is appropriate.
- Measures of adaptive behavior can be subjective, and ratings on the same individual can vary from rater to rater. Professionals aware of this characteristic can approach the significant others in a person's life and gather as much information as possible concerning adaptive behavior. This information may provide a more thorough profile of a learner's ability to function in the environment.

CAUSES OF MENTAL RETARDATION

Researchers attempt to isolate and identify causes of mental retardation, hopeful of finding ways to prevent certain conditions from occurring. The causes of mental retardation can be categorized into two groups. The first involves the largest number of retarded people, who manifest a mild intellectual handicap. For these individuals there is no clear cause of retardation, and, in fact, their handicap is probably a result of a complex interaction between heredity and environmental conditions (e.g., poverty, inadequate nutritional practices, poor prenatal care).

The second category involves the smaller percentage of retarded individuals whose disability can be traced to biological causal factors (e.g., Down syndrome, phenylketonuria). Medical science has made the greatest strides in this area and continues to discover new ways to prevent or ameliorate the harmful effects of certain etiological factors (Clewel, et al., 1982).

CHARACTERISTICS OF RETARDED LEARNERS

Levels of Severity

Over the years many terms have been used to describe the severity levels of mental retardation. For example, earlier in this century terms such as *feeble-minded*, *moron*, *imbecile*, and *idiot* were used to describe people with mild to severe retardation. Unfortunately, over time these terms began to take on negative connotations, and the characteristics the public visualized when hearing these terms were, at best, unfavorable.

Today, teachers generally come in contact with two different systems for describing the severity levels of mental retardation. The first system describes people who have the mildest retardation as *educable mentally retarded* (EMR); those who have middle level retardation as *trainable mentally retarded* (TMR); and the most severe cases as *custodial mentally retarded*. Some professionals feel that the use of these terms associates negative images with mentally retarded people (Koegal & Edgerton, 1982).

The argument focuses on the terms *educable* and *trainable*, specifically relating to ultimate functioning levels. Some professionals believe that people view EMR students as those who can only be educated in the most basic of academic skills. Similarly, TMR students generally cannot be "educated" in the traditional public school sense and instead must be trained in skills relating to self-care, basic communication, and other areas needed for a sheltered life. Terms connoting artificial limits for learners may become a self-fulfilling prophecy. As educational technology continues to advance, professionals are realizing that older notions of educable and trainable no longer hold true, because learners are now meeting skill levels previously thought impossible.

An alternative system for identifying severity levels that is becoming increasingly more popular in public schools is the one used by the American Association on Mental Deficiency (Grossman, 1983). This system identifies four levels of severity: (1) mild retardation (IQ 50–55 to approximately 70); (2) moderate retardation

(IQ 35–40 to 50–55); (3) severe retardation (IQ 20–25 to 35–40); and (4) profound retardation (below 20 or 25). These terms appear to be more general in nature and less related to preconceived educational outcomes. In this way, professionals are encouraged to look at the behaviors of specific students and design programs to meet individual needs.

Affective Characteristics

Personality problems associated with mental retardation and identifying specific affective characteristics that are related to the mentally retarded continue to be a source of debate among special educators. Traditionally, some professionals believed that personality deficits were inherent to mental retardation, finding a tendency among retarded people to be overly anxious, easily frustrated, aggressive, rigid in thinking and acting, and generally a potential menace to society. Although there appears to be a higher incidence of personality problems among the mentally retarded, these problems may not necessarily be a function of their retardation (Robinson & Robinson, 1976; Stuckey & Newbrough, 1981). Rather, personality problems or differences in the affective behaviors of retarded individuals may be the result of a complex interweaving of the person, the family, and social systems that provide services to both (Balla & Zigler, 1979; Hill & Bruininks, 1984; Reiss, Levitan, & McNally, 1982). For example, a mentally retarded child may not be born with inherent personality problems. Her family, however, may suffer the severe stress that parenting a retarded child can place on its members. This stress may affect the quality of parent-child and sibling interaction, causing the retarded child to develop personality problems (Crnic, Friedrich, & Greenberg, 1983).

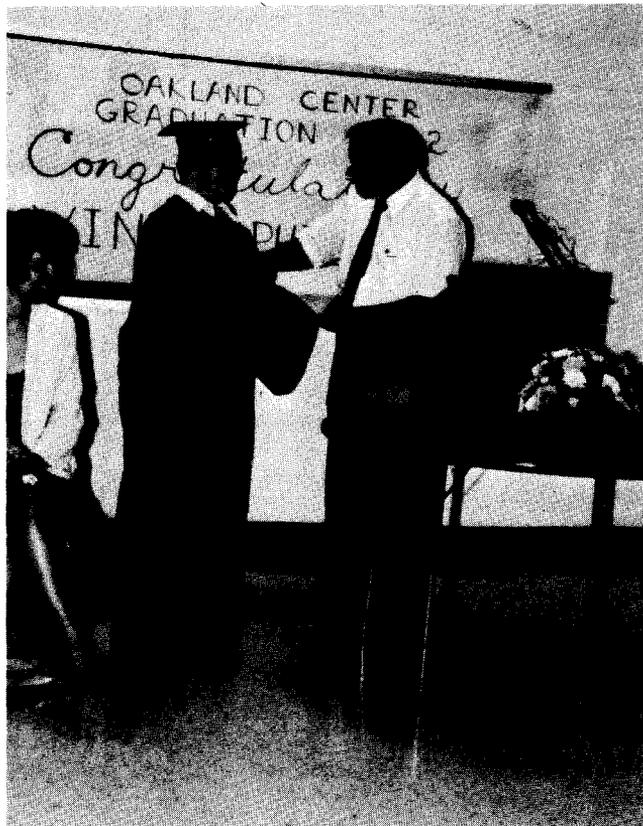
Social Learning Theory

Research efforts are generally based on some type of personality development theory. There are a number of theories; however, two of them have been the impetus for much of the available research with the retarded. Rotter's (1954, 1975) social learning theory attempts to describe an individual's personality based on that individual's perception of success or failure. Basically, perception of the degree of task difficulty may cause a retarded learner to move away from the task without engaging in the activity. On the other hand, an easier task as perceived by the learner would be approachable.

People's expectancies of success or failure are related to their experiences, whether those experiences are positive or negative. Retarded learners who experience more failures are thought to have negative expectancies.

Social Deprivation Theory

A second personality theory related to the mentally retarded that has been the basis for considerable research is the motivational approach. Zigler and his associates



According to Rotter's social learning theory, an individual's personality is influenced by his or her perceptions of success or failure. (Courtesy of Gwinnett County Public Schools, Georgia)

have attempted to refute the belief that the personality differences in the mentally retarded are a result of in-born traits (Mercer & Snell, 1977). They have attempted to demonstrate that differences in a retarded individual's personality are related to three areas: (1) varying perceptions of success and failure; (2) varying reactions to different reinforcers; and (3) varying experiences from individual to individual (Balla & Zigler, 1979). The importance of motivational factors related to these areas provides the basis for understanding certain personality problems exhibited by some mentally retarded people.

Overdependency. Researchers have attempted to identify variables that would cause a retarded person to develop abnormal affective characteristics. For example, some professionals have felt that the mentally retarded as a group appear to be overly dependent on others. When studying institutionalized mentally retarded people, Zigler and his colleagues found this to be the case (Zigler, 1961; Zigler and

Balla, 1972). However, this overdependence did not appear to be a problem caused by mental retardation; rather, the problem appeared to be related to the social deprivation these people suffered as residents of a large institution. On the other hand, results of some research studies appear to indicate that close contact with significant others lessens the tendency of retarded people to be overdependent, thus providing a strong argument for normalizing relationships between the retarded and their families or significant others.

Wariness of Adults. Social deprivation may also lead to a retarded person's lack of trust in adults. Wariness of adults, especially by institutionalized people, seems to be related to age; that is, retarded people who have been institutionalized when they are older children or teenagers tend to become more distrustful of adults.

Outerdirectedness. Another personality trait, outerdirectedness, involves the tendency for some individuals to copy or imitate the behaviors of others rather than trusting their own problem solving skills. Again, the work by Zigler and his associates sheds light on this problem. Outerdirectedness appears to be primarily a function of overreliance on external cues. Therefore, the tendency of special educators to provide continual prompts and reinforcers that are part of error-free learning may, in effect, promote this need for constant cues and feedback from others.

Anxiety. Some researchers believe that retarded people exhibit a higher level of anxiety than do other individuals. Anxiety has been found to be particularly prevalent among institutionalized mentally retarded persons (Cochran & Cleland, 1963). Enhancing a retarded person's self-concept is generally a much-discussed component of the overall special education curriculum. Unfortunately, self-concept is difficult to define and very often has different meanings among special educators. Generally, self-concept involves the ability to assess one's abilities and disabilities. Whether or not a person is able to be realistic in that assessment appears to determine the extent of his or her adjustment (MacMillan, 1983).

The problem of adequately measuring self-concept in people who generally exhibit low verbal skills has contributed to considerable confusion (Balla & Zigler, 1979). Some studies have found a low self-concept among the retarded, and some have found no difference between the self-concept of retarded people and that of the general population (Carroll, 1967; Mayer, 1966).

Locus of Control

Locus of control involves a person's ability to view the cause and effect relationship between his or her behavior and the succeeding events (Mercer & Snell, 1977). This characteristic is especially important in regard to the mentally retarded and their relationship to the law. Early authors believed that the retarded did not have the capacity to understand the differences between right and wrong.

Locus of control also has implications for the types of reinforcers an individ-

ual responds to best. For example, retarded people whose locus of control is external believe they have little control over their own behavior and thus respond primarily to external reinforcers (Bialer, 1961). The opposite is true of people whose locus of control is internal.

Bialer's research was valuable because it demonstrated that retarded people move from external to internal locus of control in much the same fashion as do many within the general population. The difference, however, involves the speed with which retarded individuals move toward internal controls. Research results appear to support instructional approaches that provide consistent consequences and feedback to learners. These approaches, as well as appropriate modeling procedures, help retarded learners to understand the effects of their actions and become more in tune to intrinsic reinforcement (Mercer & Snell, 1977).

Learning Characteristics

Professionals have always been interested in retarded individuals' potential for learning. Unfortunately, because of a lack of adequate instructional technology and the identification of inappropriate curricular options, retarded learners historically were thought to be capable of far less than teachers now know is possible. With the instructional technology that exists today, severely retarded students, for example, are learning complex vocational skills that are allowing them to become somewhat competitive in the job market (Horner & Bellamy, 1978).

Zigler's social deprivation theory and Rotter's social learning theory can contribute to teachers' understanding of the motivation that retarded individuals have to learn new skills. If social deprivation affects individuals as the results of research suggest, some retarded learners may mistrust adults who are their teachers and work within the confines of a narrow bank of tangible reinforcers. Each of these situations can adversely affect learning. Social learning theory suggests that motivation to learn may be strongly affected by the person's perceptions of the tasks as being easy or difficult. According to this theory, the types of perceptions that a person has are linked to the individual's history of failure and may cause avoidance of tasks perceived as too difficult to attempt.

This approach or avoidance behavior, theorized by Rotter and others, can have serious effects on the learning progress of some retarded learners. Deficits in motivation will need to be identified early by teachers in order to modify instructional procedures to meet these needs.

Memory Deficits

Researchers have been interested in the effects that mental retardation may have on a person's memory. New experiences providing unfamiliar circumstances require that the individual use previous knowledge and apply it to the situation at hand. A number of research efforts have identified a deficit in short-term memory among retarded individuals (e.g., Ellis, 1963; 1970). Conversely, other research efforts

have demonstrated that mentally retarded persons retain knowledge over longer periods of time (long-term memory) as well as nonretarded individuals (Belmont, 1966).

The work completed by Zeaman and House (1963) involving discrimination learning may provide some insight into possible strategies for dealing with a retarded learner's memory deficits. One explanation for deficits in short-term memory identified during these research efforts was that retarded learners generally do not attend adequately to relevant stimuli in the learning task. This problem in paying attention to the task at hand may be directly related to memory problems.

Two aspects of learning theory that have led to strategies for assisting retarded students are called *mediators* and *paired associates*. Mediators involve the use of some "memory bridge" between stimuli and responses. For example, a common mediator used by some elementary students involves memorizing the sentence, "My very educated mother just served us nine pickles." The first letter of each word in the sentence represents the planets in the solar system in the order of their positions from the sun (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto). This memory device helps the student to bridge the gap between information learned and the ability to recall it under specific circumstances (Borkowski & Varnhagen, 1984).

Paired-associate learning involves pairing two words together so that when one word is used as the stimulus the other word will result as the response (MacMillan, 1983). Research results indicate that retarded learners have more difficulty than their nonretarded peers in using paired associates for learning (O'Connor & Hermelin, 1963). However, these differences appear to be related to the types of materials used in the research. Specifically, when the material is meaningful to the student and more concrete in nature (e.g., pictures), the retarded learners can make the associations as well as their nonretarded peers (Spitz, 1966).

Skill Generalization

Paired-associate learning deals with the acquisition of a skill or series of skills; however, once the skills are learned they must be transferable to other situations before they can be useful to the individual who has acquired them. The ability of retarded persons to generalize acquired skills has become an important point of interest among educators.

In the past, many educators assumed that once retarded individuals were taught skills in the classroom, they would automatically be able to transfer those skills to other settings, where different materials are used or different people are supervising the activity. A number of research efforts have demonstrated that this assumption may not be true (Wehman, Abramson, & Norman, 1977). Since retarded learners do not generalize learned skills and knowledge across conditions as well as their peers, teachers may need to be more aware of strategies that will assist the student in transferring training.



Knowing the affective and learning characteristics of retarded individuals can give teachers a better understanding of how certain instructional techniques can increase the probability that these students will learn. Following are some ideas related to research on these characteristics that teachers can incorporate into their classes:

- By *gradually* fading cues and prompts, teachers may help retarded learners to come to rely more on their own problem solving abilities.
- Breaking a task into smaller parts (task analysis) may help to relieve some of the anxiety exhibited by some retarded learners when facing a new activity.
- Retarded learners can be encouraged to discuss their own strengths and weaknesses regarding a specific task.
- Breaking a task into component parts may also reduce the avoidance behavior of some retarded learners.
- *Gradually* fading artificial reinforcers (e.g., candy, free time) and allowing more natural reinforcers (e.g., smiles, pat on the back) to take effect may assist learners in becoming more confident in their internal abilities to control the environment around them.
- Retarded learners will often require a number of repetitions before a skill or set of skills can be learned. An important technique is to vary the activities used to teach these skills, minimizing boredom while increasing the students' attention to relevant stimuli.
- Verbal mediators can help students learn new words and concepts (MacMillan, 1972; Milgram, 1967). For example, a teacher wishing a student to learn the words *ball* and *box* may construct a sentence that includes the two words (e.g., "The *ball* is in the *box*.") The sentence acts as a mediator, assisting the student in remembering the key words.
- Spitz (1966) highlighted the need for using paired associates in teaching retarded learners. Words and experiences familiar to a student can be paired with unfamiliar content to form an association that may assist the learner in retaining the new information.
- Varying settings, times of the day, materials, and persons working with the student may facilitate the generalization of learned skills (Langone & Westling, 1979; Stokes & Baer, 1977).

BASIS FOR A FREE AND APPROPRIATE EDUCATION

Litigation Concerning Institutionalization

Society has a long history of treating the mentally retarded inhumanely. This problem existed into the 1960s and 1970s within large institutions, where residents

were found beaten, ill-fed, and sexually abused (T., 1974). During the late 1960s parents and advocates of the handicapped, frustrated at their attempts to work directly with state agencies and local education systems, began to look to the judicial system to uphold individual rights. As a result of these efforts, by the mid-1970s 35 states had affirmed the rights of the handicapped either judicially or through statutes resulting from judicial proceedings (Stick, 1976). During this same period 899 bills dealing with education for the handicapped were introduced into various state legislatures, of which 237 were enacted into law (Stick, 1976).

The litigation that provided the legal base for enacting laws to protect the rights of the handicapped involved a large number of court cases. During the early 1970s a series of court cases in Alabama known originally as *Wyatt v. Stickney* (1971; 1972) demonstrated how the courts could order state institutions (i.e., Partlow State School, Tuscaloosa, Alabama) to provide minimum care and treatment for residents of these facilities.

Basically, the court ordered steps to be taken to correct inadequate care and obvious infringements on the residents' rights to well-being. These steps are summarized as follows:

1. The state would immediately hire 300 resident care workers, including professionals, within 30 days. In addition, within 10 to 15 days of the court's decision, a team of physicians would appropriately immunize all patients (*Wyatt v. Stickney*, 1971).
2. The court established a master and an expert advisory panel to oversee the correction of abuses and insure dignity and human rights of the residents (*Wyatt v. Stickney*, 1971).
3. The court established minimum standards for evaluation when classifying residents. Also, standards were set for client-staff ratios and for individual habilitation plans (*Wyatt v. Stickney*, 1972).
4. The court dictated to the state of Alabama that unavailability of funds, staff, or facilities could not be used as an excuse to deny treatment and adequate conditions. Instead, the court served notice to the state that if the legislature would not provide the funds, the court would be forced to order the sale of state lands or place an injunction against what it deemed as unnecessary state expenditures (*Wyatt v. Stickney*, 1972).

A case similar to the *Wyatt* litigation was reviewed in New York State and involved the controversy surrounding the Willowbrook State School and inappropriate care and treatment of the institutionalized mentally retarded (*NYARC v. Rockefeller*, 1973). In this case, the court did not take the same radical stand as in the Alabama case. Specifically, the court felt that the residents of Willowbrook had no constitutional rights to treatment or due process and that the state was not required to provide the mentally retarded with a certain level of special education. However, the court ruled that residents did have the basic human rights such as clean living conditions, protection from other residents and staff members, and due process for admittance and labeling.

The two cases discussed here dealt with mentally retarded persons committed to state institutions. Although the two outcomes were different in degree

regarding what each state was forced to do, the basic principles of the rights of the handicapped were clearly established. More important, the public was made aware of the conditions under which the mentally retarded were still living. Public awareness became an important tool to be used in order to achieve enactment of legislation affirming right to treatment and education.

Litigation Involving Public School Programs

The same period (late 1960s to early 1970s) found a number of states and school systems involved in court cases attempting to establish both the right of the handicapped to a public education and the right to appropriate educational practices for those enrolled in school programs (Keim, 1976). A major court case that questioned the inappropriate placement of children into special education classes was *Hobson v. Hansen*, 1967). The court ruled that using culturally biased tests to track children in the Washington, DC school system was unconstitutional.

Diana v. The State Board of Education (1970; 1973) involved the use of culturally biased tests for placing Spanish-speaking children in classes for the mentally retarded. The court ruled against the state of California and ordered that the Spanish-speaking children be reevaluated using intelligence tests translated into Spanish.

The Pennsylvania Association for Retarded Children (PARC) v. The Commonwealth of Pennsylvania (1971) was one of the more important cases that later became the basis for the Education for all Handicapped Children Act (P. L. 94-142). This case was a class action suit affecting all mentally retarded individuals in Pennsylvania. After hearing the testimony from recognized experts, the court ruled that all retarded persons were capable of benefiting from an educational program.

Another crucial case that assisted in laying the groundwork for P. L. 94-142 was the *Mills v. The Board of Education, District of Columbia* (1972). The following principles were delineated as a result of the Mills class action suit:

1. The District of Columbia had an obligation to provide whatever special instructions will benefit the child who is determined to be mentally retarded, emotionally disturbed, or hyperactive.
2. The District of Columbia needed to apply the right of due process before expelling, suspending, or reassigning regular students as well as handicapped students.
3. Insufficient funding and administration inefficiency could not be used as an excuse to cut back programs for the handicapped. The court ruled that where limited funds were a problem, existing funds must be distributed evenly across both nonhandicapped and handicapped students. Funds from low priority programs (band, sports) were to be redistributed to programs for handicapped learners if additional funding was unavailable.

One final case that was important for ending the practice of discriminatory testing was *Larry P. v. Riles* (1972). Similar to the *Diana* case mentioned earlier, the

Larry P. litigation was concerned with the practice of labeling Black children as mentally retarded solely on the basis of intelligence test scores. The court ruled that this practice was discriminatory because of the built-in cultural biases of intelligence tests. In addition, the court affirmed the importance of adaptive behavior in the labeling process and required procedural due process to accompany any classification of a student.

There were many other cases brought to the attention of the public during this time period. Some of the cases ruled in favor of the handicapped and some against. Parents and advocates began to use the principles established in these court cases to stimulate legislatures into enacting laws that once and for all established the right of handicapped persons to a free and appropriate education and affirmed their civil rights as citizens.

Legislation Establishing the Rights of the Handicapped

Since 1973 there have been a number of federal legislative efforts enacted ensuring the rights of handicapped persons. To enforce individual state compliance with these laws, the federal government stipulated that states or corporations could lose federal funding when not in accord with the tenets described in the legislation.

The Vocational Rehabilitation Act of 1973 (P. L. 93-112) was one of the first pieces of legislation that encouraged equal opportunity for handicapped individuals. This law stated that a person could not be discriminated against (i.e., excluded from programs or denied benefits) because of a handicap in any program receiving federal funding. Further, the bill provided funds for a number of innovative program efforts including individual rehabilitation plans, comprehensive vocational evaluation, construction/improvement of rehabilitation facilities, and expansion of employment opportunities for the handicapped in both public and private sectors.

The most notable component of the Rehabilitation Act was Section 504, which as amended protects the handicapped against discrimination. Section 503 of this law obliges employers receiving a certain amount of federal funds to begin an active affirmative action program for hiring handicapped persons. These two sections together provide a powerful force for protecting the rights of retarded and all other handicapped individuals. Section 504, for example, provides one basis for enforcing the regulations of P. L. 94-142, citing that denial of an education is an infringement on civil rights. Section 504 also provides for an individual's right to equal access to public facilities and has stirred public awareness to the plight of handicapped persons in regard to physical barriers existing in the community.

Another law providing a tremendous boost to program development for handicapped individuals was the Vocational Education Amendments of 1968 (P. L. 90-576). These amendments provided that as a national priority area, 10% of a state's basic grant to implement vocational education would be "set aside" to develop programs for handicapped people.

P. L. 91-517, The Developmental Disabilities Services and Facilities Con-

struction Amendments, emphasized the existence of a wide variety of disabilities, including mental retardation, which originated before the age of 18 and were expected to continue indefinitely. The main purpose of such a bill was to coordinate services and project the needs of the disabled population after they left the public schools, or to provide services that may be needed by individuals outside of the realm of education (Lubin, Jacobson, & Keily, 1982).



IDEA FILE



There are many more topics relating to the care and treatment of the mentally handicapped than can be presented in this chapter. Following is a list of some relevant topics that interested readers may wish to pursue:

- Respite care services provided by the law (Appoloni & Triest, 1983; Cohen, 1983)
- Living environments for retarded persons (Balla & Klein, 1981)
- Special education legal hearings (Budoff & Orenstein, 1981)
- Multiple developmental disabilities (Jacobson & Janicki, 1983).

The final piece of legislation discussed in this section probably has the most implications for teachers of mentally retarded learners. The Education for All Handicapped Children Act (P. L. 94-142), passed in 1975, has done much to ensure the rights of handicapped individuals to an education. This effort is an amendment to the Elementary, Secondary and other Educational Amendments of 1969 Act (P. L. 91-230) and is not in itself a separate law. The reason for adding P.L. 94-142 to existing legislation was partly a symbolic one; that is, the attempt was made to demonstrate that education for handicapped children is not a separate entity; rather it is a part of the total educational program.

There are a number of important points mandated by P.L. 94-142. The following is a summary of the guarantees provided by the law:

1. All handicapped children between the ages of 3 and 21 are entitled to a free and appropriate public education. The exception occurs when individual state law prohibits educational programs for children under the ages of 5 or 6.
2. Handicapped children have the right to be educated in the least restrictive environment to the maximum extent possible. Basically, this point of law means that all efforts must be made to bring closer contact between handicapped and nonhandicapped learners (e.g., resource room placement or having classes in the same school). However, the key point is that least restrictiveness is based on the learner's needs. For some learners, the least restrictive environment may be a residential facility because of their acute and chronic medical needs in addition to severe mental retardation. Least restrictive in these cases may mean that they are housed in community hospitals close to their families instead of a traditional state institution. Flexibility, then, is an important concept of least restrictiveness.

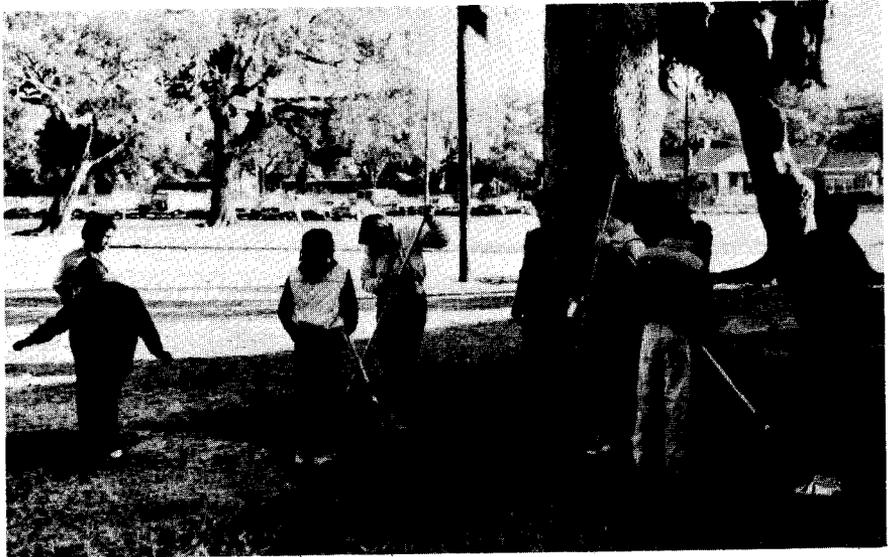
3. An appropriate education relates to the right of handicapped learners to have developed for them an individualized education program (IEP). The IEP serves as a link between the parent, school system, and in some cases, the child, so that all may work together to establish a program based on learner needs. Also, the IEP is a vehicle by which parents and the school system can resolve their differences. Finally, the IEP serves as a management tool by placing in writing a commitment of resources needed for the program and establishing a monitoring system to ensure student progress or, if needed, a program change. The following are the components of the IEP:
 - a. Current level of student performance.
 - b. Annual goals and short-term objectives.
 - c. List of related services.
 - d. Time-line for related services.
 - e. Extent of regular class placement, if possible.
 - f. Evaluation of student progress.
4. The IEP must be developed in a conference where the parents, teacher, representative of the school administration and, if possible, the child are in attendance.
5. If the parents or the student's advocates are not satisfied with the program, they



The Education for All Handicapped Children Act (P.L. 94-142) demonstrates that education for the handicapped is part of the total education program. (Courtesy of Kay Shaw)

have the right to due process. Basically, due process includes the following procedures:

- a. All records pertaining to their child are open for the parents' examination.
 - b. Parents are allowed to obtain an educational evaluation of their child independent of the school system's evaluation or evaluators.
 - c. Parents have the right to be accompanied by legal counsel, to confront and cross-examine witnesses, and to present evidence.
 - d. Students have the right to be protected against the use of discriminatory tests.
 - e. Parents must have written notice in their native language when the school system proposes any changes in their child's program, identification, or classification.
 - f. Surrogate parents must be appointed if parents or guardians cannot for some reason represent the child.
 - g. Parents have the right to have their case decided by an impartial hearing officer based solely on evidence presented, with the burden of proof on the educational agency.
 - h. Parents have the right to pursue further action through the courts if they are not satisfied with the due process hearing.
6. The handicapped student has the right to related services necessary for success in an educational program. These services include transportation, speech pathology, audiology, physical and occupational therapy, psychological counseling, medical diagnosis, and recreation.



Daily living skills are important components of the Individualized Education Program (IEP). (Courtesy of Glynn County Public Schools, Georgia)

7. Extensive child find identification procedures must be used to identify handi-capped children at birth or at a young age to ensure that proper services are provided.

The source of enforcement the federal government has used to guarantee compliance with P.L. 94-142 has been federal flowthrough funds that are allotted to the states and passed on to the local districts. In order for the states to receive this funding, a number of procedures delineated in the law needed to be met in relation to a set timetable.



KEY CONCEPTS



Litigation and legislation over the past two decades have affirmed and established the rights of retarded learners to a free and appropriate education in the least restrictive environment.

- Institutions have been found to be the least desirable alternatives for retarded individuals. In Alabama and elsewhere courts have developed strict guidelines for the care and treatment of residents in state facilities.
- The courts have directed to many states policies for fair treatment of the handi-capped and an equal opportunity to an education including protection against discriminatory testing practices, avoidance of due process procedures, and unfair classification procedures.
- Section 504 prohibits discriminatory practices against the handicapped.
- The Vocational Amendments provide funds to be set aside for inclusion of the handicapped into vocational education programs.
- P.L. 94-142 provides handicapped people many rights to a public education and programs to meet their individual needs.
- The federal government enforces these laws for the handicapped by threatening to withhold funds earmarked for the states if they do not comply with the regulations.

Current Socio-Political Climate

During the 1970s the field of special education enjoyed continued growth in financial support for program development from both federal and state governments. By the end of the decade, the role of the federal government had increased to one of tremendous influence over what constituted appropriate educational programming at the state and local levels. This increasingly complex role is not without critics who base their views primarily on the rights of the states to govern education. Unfortunately, the states have not had an exemplary record in providing appropriate programs without federal intervention.

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The trend toward shifting the responsibility for developing and monitoring education for the handicapped appears to be moving back to the states. This trend appears to be closely linked to the problems of severe inflation and a large federal budget deficit. With the election of the Reagan administration, the push from Washington was twofold. First, there was an attempt to cut budgets, precluding any significant growth in program development and resulting in cutbacks for existing programs. Second, the push for states' rights has given rise to the idea of *block grants*. Block grants would entail the federal government's sending a total amount of money for education to a given state, allowing that state to fund its own educational priorities. In theory, the idea of block grants has merit because each state has somewhat different needs. However, the reality that the funds may go to the group with the most powerful lobby, resulting in inequitable funding for the handicapped, becomes much more of a threat.

Fortunately, the support from Congress for the handicapped continues to be strong, and block grants have thus far been avoided for special education. However, there will always be a need for parents and advocates to be diligent in speaking out for the handicapped. A decision by a New Jersey court ruling that the severely and profoundly retarded are not capable of being educated and are not entitled to free public education (*The National Advocate*, 1981-82) is a good example.

There are additional instances demonstrating a swing away from providing so many services for the handicapped. For example, in the case of *St. Louis Developmental Disabilities Training Center Parents Association, et al. v. Arthur Mallory, et al.* (1984) the court basically ruled against the plaintiffs, finding that segregated settings for severely handicapped students were in some cases appropriate (Burton, unpublished manuscript).

Two recent Supreme Court decisions (*Smith v. Robinson*, 1984; *Irving Independent School District v. Tatro*, 1984) determined that attorney fees are not available to the plaintiffs as a provision of P. L. 94-142. Also, the decisions ruled that there are limitations to how far a local education agency has to go to provide related services for a handicapped child.

These cases may not have devastating effects on the rights of the handicapped; however, when taken in conjunction with the economic climate and a return to states' rights, they signal advocates of the handicapped to keep legislators informed of the need to maintain educational programs for these students as a high priority area.



KEY CONCEPTS



- By the end of the 1970s the federal government exerted a great influence over state and local programs for the handicapped.
- During the 1980s the primary responsibility for developing and monitoring programs for the handicapped has shifted back to the states.

- There has been some evidence that the courts are beginning to rule against the handicapped in cases involving requests for services. For example, the Supreme Court determined that attorney fees are not available to the plaintiffs as a provision of P. L. 94-142.

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PROGRAM ALTERNATIVES AND DEVELOPMENT

■ Some professionals may have misinterpreted the philosophy of the least restrictive environment. Basically, it means that handicapped learners should be educated in environments as close to normal as possible, determined by each individual's abilities and disabilities. The principle of least restrictive environment was developed to minimize placement of retarded learners in residential settings when their current needs do not dictate that type of environment (Leinhardt & Pally, 1982). Rather, retarded individuals in residential settings should have educational goals designed to assist them in moving to less restrictive settings as soon as possible.

This principle applies to all severity levels of retarded learners. For example, a mildly retarded student who has the skills to participate in regular classes with support from special educators should be placed there on a full-time basis. Similarly, severely retarded learners should not be placed in an institutional program if they can benefit from the experiences of self-contained public school classes. Least restrictiveness emphasizes the fluid nature that programs for retarded learners should take (McCord, 1983).

NEED FOR FLEXIBLE PROGRAM OPTIONS

Educational options for the retarded historically have been static; once a learner was placed, there generally was little movement from one placement option to another. In contrast to this, the principle of least restrictive environment suggests that a learner's needs are continually changing, and with those changes comes the need to modify program options when and where necessary. Setting program goals designed to move learners on a continuum toward less restrictive environments appears to be a desirable approach.

Rigidity in placement options may also exist within special education program options. Students who have been classified as moderately retarded may have little chance of being exposed to program options for the mildly retarded, even if the appropriateness of these options can be demonstrated. Conversely, mildly retarded learners who could benefit from skills that can be obtained in a prevocational program for the moderately retarded may be excluded from such a program. An important part of the least restrictive environment is the principle of individualization: Where each learner has unique needs, programs are developed to meet those needs. As these principles become accepted, there should be much less emphasis on categorical labeling of students. At present, however, there may still be a tendency to place learners primarily based on category (e.g., mildly, moderately, severely, or profoundly retarded).

BRIDGING THE COMMUNICATION GAP

The number and variety of duties that teachers must perform may cause some to lose sight of the existing continuum of services ranging from preschool to postsecondary. Consequently, learners entering a secondary program who did not receive instruction in career awareness and basic prevocational skills at the elementary level may be gravely disadvantaged in a program designed to instruct them in independent living and vocational skills. Therefore, there is a need for continual contact among teachers of the retarded across program grade levels as well as between general and special education.

There are some specific suggestions teachers may find helpful in bridging the communication gap between different programs. First, teachers should become thoroughly acquainted with professionals from all other grade levels that students will come from or move toward. For example, elementary teachers for severely retarded students could visit the classrooms of both preschool and secondary programs in their catchment area. In addition to visiting those classes for the purpose of observing teaching techniques and materials, the teachers may have the opportunity to coordinate program objectives in a scope and sequence fashion across different levels. Teachers along the continuum should know what skills the students are working on at the various points in their programs. An additional benefit of increased teacher contact can be the coordination of assessment methods. If two teachers have been communicating on a regular basis, a learner entering a new program should not arrive without adequate support data.

Teachers also need to have a good working knowledge of community services such as respite care centers, sheltered workshops, work stations in industry, physical therapy, recreational opportunities, and emergency funding sources. Beyond knowing of the existence of such services, teachers will need to visit these programs and establish working relationships with the professionals who staff them.

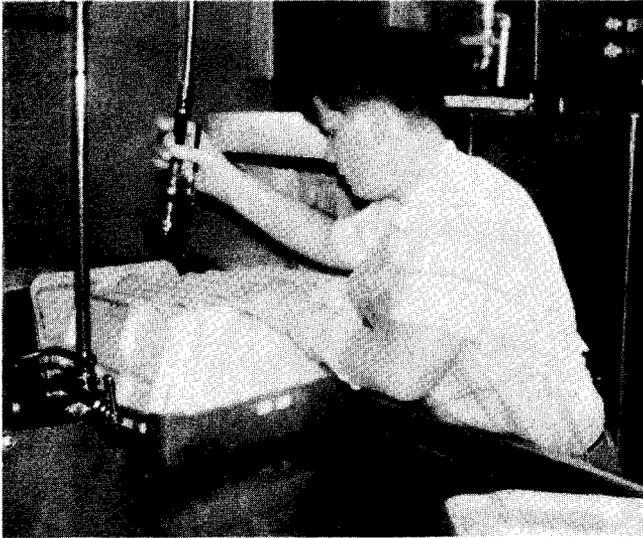
One illustration of this is the case of a 19-year-old severely retarded learner named Sam. Sam was progressing at a satisfactory rate in the areas of functional literacy (e.g., reading menus in fast food restaurants), social skills including



Continual contact between teachers of all grade levels and programs is necessary to ensure a comprehensive and beneficial learning program for the student. (Courtesy of DLM Teaching Resources, Allen, Texas)

interpersonal communication, use of the telephone, and a variety of other independent living skills. Sam was also included in an innovative program allowing him to participate in a variety of vocational education programs with general education students. The primary focus of these vocational program options was to allow Sam time to practice and generalize skills he learned in special education to settings more like community placements. This approach also allowed him to learn basic vocational skills aimed at eventual employment.

At this point, Sam demonstrated that he might be ready for increased community interaction. A teacher in continual contact with available community services (e.g., vocational rehabilitation) would be in a position to identify sites that could accommodate Sam for half the school day, allowing him an additional opportunity to generalize his skills to the natural setting. Where program options such as this do not exist, a closer working arrangement with community-based professionals, employers, and citizens could provide a resource for developing additional placements.



To function in a community setting, retarded learners must be able to generalize skills learned in the classroom.
(Courtesy of Gwinnett County Public Schools, Georgia)

MAINSTREAMING

Mentally retarded learners can be placed in many different program options ranging from less restrictive to more restrictive in nature. Less restrictive models, generally called *mainstreaming alternatives*, involve placing handicapped students in contact with their nonhandicapped peers for a majority of the school day. In practice, mainstreaming is a word with many definitions. Some policy statements refer to mainstreaming in a broad sense, allowing all handicapped persons the right to participate with their general education peers to the maximum extent possible (The Council for Exceptional Children, 1976). This definition includes both placement of mildly retarded learners in regular classes and placement of severely retarded learners in community-based programs. Other professionals view mainstreaming as a more restricted concept that deals with the delabeling of mildly retarded students who are capable of participating in general education programs (MacMillan, 1977). Mildly retarded students are the population most affected by mainstreaming (Vitello & Soskin, 1985). Since Dunn's (1968) famous article questioning the validity of special education for the mildly retarded, there have been major efforts to avoid placement in self-contained classes that some professionals felt created stigmatizing labels and barriers to socialization.

Because of these efforts to move mildly retarded learners back to regular classes, professionals have observed that the population now known as "EMR" apparently exhibits very different characteristics (Polloway & Smith, 1983). The

students remaining in self-contained EMR classes function at lower levels and would traditionally have been classified in the higher range of the TMR group.

At the heart of the debate that still rages is the question of whether or not special education can help mildly retarded students to progress faster than regular education classes. The evidence of a large number of efficiency studies appears to be split (e.g., Carlberg & Kavale, 1980; Gresham, 1982), with some studies supporting the efficiency of mainstreaming while others support the efficiency of special education as the primary service delivery model. This debate, combined with the results of legal and legislative efforts, may have created what Strain and Kerr have termed “a single solution to a complex problem” (1981, p. 32).

Gottlieb (1981) presented strong evidence supporting his opinion that wholesale mainstreaming of EMR students has not been effective. Based on his arguments, it appears that on the whole these children continue to be socially rejected and that in many cases their movement to regular classes represents little change in racial balance.

The question of whether EMR students should be mainstreamed cannot be answered only by using criteria such as percentages per school system or the fact that mainstreaming is a less expensive alternative to self-contained EMR classrooms. There are many mildly retarded students for whom self-contained classes may indeed be the “least restrictive environment” (MacMillan & Borthwick, 1980).

Since the major concern of the mainstreaming debate has been to justify *where* mildly handicapped students should be taught (Gottlieb, 1982), it may have served to cloud the most important issue of *what* to teach these students. This concern keeps many professionals from realizing that in both self-contained and mainstreamed settings the major emphasis has always been on teaching traditional academic skills. The “back to basics” movement accentuates this emphasis and may serve to further delay the development of a more appropriate curriculum for these learners (Smith & Dexter, 1980).

As the field of special education moves into the second half of the 1980s, there appears to be a renewed interest in a close inspection of the curriculum in both self-contained and mainstreamed settings. Professionals such as Polloway and Smith are calling for a move away from the “narrow focus on academic and remedial concerns” (1983, p. 157). The alternative is to develop a curriculum that is community-valid. Community-valid skills are those that allow students to learn and practice skills applicable to community life. Therefore, a mildly retarded student assigned to a United States Government class would not be asked to try and memorize the branches of government. Instead, the student might be taught to call the local office of the senator representing his district and request assistance in obtaining, for example, information about changes in his social security benefits.



IDEA FILE



Some professionals support definitions that are overconcerned with the administrative functions while giving little consideration to the daily instructional prob-

lems involved in making mainstreaming a success (Kaufman, Gottlieb, Agard, & Kukic, 1975). For example, some IEP staffings may result in heated discussions concerning how much time a student should spend in the regular class before the student is considered "mainstreamed." These arguments can misdirect staffing committees (including teachers) and take time from valuable program planning.

Teachers may be in a position to redirect staffing committees into considering mainstreaming as Kaufman and colleagues have termed it—an "instructional approach" (1975, p. 4). Teachers can point out that effective programming in the mainstream primarily involves development of appropriate services. These services include assessment of learner strengths and weaknesses, designing and implementing effective instructional interventions, and monitoring the interventions for success (revising whenever and wherever necessary). The issue is not the quantity of time spent in regular education, but the *quality* of time spent under these conditions. Teachers may look upon themselves as facilitators, directing other professionals toward the more important considerations of successful programming.

Mainstreaming allows handicapped learners to participate in classes with their general education peers whenever possible. The following sections present descriptions of placement options currently in use for educating handicapped students. The models presented range in restrictiveness from those allowing maximum integration to those allowing minimum integration, depending on individual student needs. Teachers can increase contact between retarded learners and their general education peers in all settings regardless of the existing level of integration, and techniques will be presented here that are designed to assist teachers in increasing such contact.

A Model for Consulting Teachers

The consulting teacher model allows mildly retarded learners to participate fully in the regular classroom. The special education teacher has no direct instructional time with the students included in this placement option (Anderson, Martinez, & Rich, 1980; Reynolds & Birch, 1977). This system allows the special educator to be a consultant to general education teachers, assisting them in developing appropriate assessment tools, modifying the curriculum, and identifying effective educational interventions. The general education teachers, however, provide all the direct instruction.

There are several conditions needed for this model to be an effective alternative for educating mildly retarded learners. First, the special educator must be expert in diagnosing learner deficits and then matching appropriate methods and materials to those needs. This requirement is important since the consultant must be able to provide the regular class teacher with meaningful assistance in the form of ideas, materials, and techniques (Heron & Harris, 1982).

Second, in the relationship between the two educators equal importance must be assigned to the roles of each teacher (Rauth, 1981). If the consultant's role is looked upon as being something more important or prestigious than that of the classroom teacher, the relationship may be hindered (Reynolds & Birch, 1977). This consideration is important to teachers who are or will be functioning in this type of instructional environment. An effective change agent (in this case the special educator) should not enter the classrooms of other professionals to "tell" them how to run their program. Rather, a more effective technique is to sincerely present the role of a consultant as a support service, there to aid an overburdened teacher.

The techniques teachers use to instruct learners may be useful for presenting effective teaching methods to general educators (Idol-Maestas, 1983). For example, inservice providers often try to present new ideas and methods via lectures and discussions; however, there is little evidence that teachers actually transfer this knowledge into practice (Hentschel, 1977). Instead, the consulting teacher may choose to model techniques targeted for use with specific learners (e.g., demonstrating a behavior management technique).

Consulting special education teachers can also become the source of reinforcement for general educators. For example, when general educators incorporate various direct product measurement systems into their programs, the special educator can provide some form of sincere social reinforcement. A statement such as, "I really like the method you used; I never actually considered that possibility," can go a long way with some professionals.

Quality is as important as quantity when making contact with the regular education teacher. Consulting teachers who are only infrequently available or those who are frequently available but only for cursory visits will probably not provide services that are adequate for a classroom teacher. Contacts should be frequent, preplanned, and organized so that specific objectives are covered during the time available for the meeting. A few minutes at the end of the visit spent planning what is to be accomplished during the next contact may increase the probability that the goals will be met.

A Model for Resource Teachers

Considerable variations exist in resource teacher models among public school programs (Payne & Patton, 1981). This placement option involves enrolling mildly and, in some limited cases, moderately retarded students in regular classes for at least part of the day. The remainder of the school day is spent in a resource center where the special educator provides direct instruction using either remedial or compensatory instructional techniques. These programs vary in form and the amount of time that students participate in regular education programs. For example, in some school districts mildly retarded learners may be enrolled in regular education programs such as physical education, art, and music while receiving all of their academic training in a resource center. Conversely, in some districts learners may be enrolled in regular education classes at least half of the

school day before they become eligible for a resource teacher's services. The second example is probably the one that best describes a resource program.

The objectives of a resource room are generally consistent with what many define as mainstreaming. Resource models strive to provide services for those students who because of learning problems are currently unable to participate on a full-time basis in the regular classroom. In a sense, this model may be a vehicle to prepare students for entering a consulting teacher model program as soon as possible. The goals of a resource program are to provide individual or small group instruction based on the learners' deficit areas while developing innovative instructional techniques that can be used with the students while they are in the regular classroom. Many successful resource center programs are currently in operation. Their success can usually be traced to one or two people who are able to put into practice some basic tenets of good programming. Programs that use peer tutors and volunteers are examples of how teachers can increase the efficiency of instructional interventions.

Special educators have the opportunity to develop a plan designed to increase and maintain quality contacts with regular educators. Initially, special educators can assist their colleagues in understanding the principles of curriculum modification, that is, the need to identify specific content that is appropriate for a given learner. This model is quite the contrary of one where teachers assume that mildly retarded learners must be exposed to everything in, say, a particular chapter in an earth science textbook. The resource teacher can assist the regular educator in choosing only those curricular objectives that are appropriate for the student.

From the initial contacts, the resource teacher can foster a relationship allowing each educator to provide suggestions for effective instructional procedures. The probability increases that interventions designed by both teachers and tried out in the resource center will in turn be implemented in the regular classroom.

There are retarded learners who, because of the nature of their strengths and weaknesses, require more structured placement than a consulting or resource option provides. These learners range from a small number of mildly retarded learners to most moderately retarded and all severely retarded students enrolled in public school programs.



IDEA FILE



Special educators have the opportunity to develop a plan designed to increase and maintain quality contacts with regular educators. Resource teachers in particular should spend as much time as possible interacting with and supporting the activities of their regular education colleagues. The following ideas might provide teachers with a starting point for increasing contact with other professionals.

- Resource teachers might consider identifying three or four regular educators per month as people to get to know. As an "icebreaker" they might invite them to an afternoon coffee session to share ideas and tell about each other's programs.

- Weekly reports on the students' progress toward certain objectives can be helpful to regular educators whose students are served by the resource teacher.
 - Information on weekly reports can include a sharing of ideas targeting effective instructional procedures and identifying aspects of the regular education curriculum that appear to be useful to the students.
 - Writing a newsletter to share ideas and teaching strategies and to highlight noteworthy achievements of regular educators as they work with handicapped students can be a good method for resource teachers to become a more integral part of the school.
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A Model for Teachers of Self-Contained Classes

Self-contained special education classes are designed for retarded learners who can not benefit from enrollment in a regular class. Primarily, these students are unable to keep up with the instructional pace (Payne & Patton, 1981), and heavy emphasis on traditional academic objectives may not meet their needs.

The arguments are numerous both for and against special class (self-contained) placements for retarded learners (specifically the mildly retarded), with a voluminous amount of research either supporting or refuting the effectiveness of these program options. A cogent statement by MacMillan (1977) presents a logical philosophy that could be derived from careful analysis of the pros and cons of self-contained public school classes for retarded learners:

To contend that any one administrative arrangement is the best for *all* EMR children, or, conversely, to argue that one is *bad* for all EMR children, is naive and ignores variation in individuals within the population of EMR. (1977, p. 431)

The same, of course, can be said of all moderately retarded learners when considering placement alternatives. One reason why self-contained special education classes have received a bad name (especially in the area of mild retardation) may be because in some instances they have been used as a dumping ground. Some self-contained classes may include an overproportional number of minority group members. They also have been known for easy enrollment policies and an almost insuperable barrier against leaving the program once admitted.

Some students with severe educational deficits can benefit from classes with smaller enrollment and curricular options designed for maximum community integration. However, this option should also allow students placed in special classes to have opportunities for participating with their general education peers whenever possible.

Mildly retarded learners spending most of the school day in a special class can be integrated into basic remedial programs, nonacademic programs and clubs, lunch, work-study programs, and vocational education classes. Moderately retarded students may benefit by integration into program options similar to these with a particular emphasis on the career and vocational aspects.

Severely retarded learners enrolled in self-contained public school classes could benefit from more contact with their general education peers, but probably would not benefit from inclusion into most mainstreaming situations. The use of peer tutors from regular education programs would increase the contact of these retarded learners with classmates from outside special education as well as provide opportunities for the general population to get to know and assist retarded learners (Dale, 1979; Langone, 1981).



KEY CONCEPTS



Self-contained special classes for retarded learners can be an acceptable placement option provided the decision is based on information such as the need for more individualization, specific objectives offered in the self-contained class, and identified student strengths and weaknesses that can best be served in a self-contained setting.

- Teachers of mildly retarded learners should continually reevaluate the placement and attempt to integrate learners into less restrictive placements as soon as possible.
- Teachers of moderately and severely retarded learners will continually be developing innovative activities that allow these students quality contact between their general education peers and the community at large.
- Quality contact as stated above refers to activities such as integrating retarded learners into vocational education programs, developing work stations in industry, training independent living skills in community sites, and developing recreation and leisure programs that include both retarded and nonretarded students.

A Model for Hospital/Homebound Teachers

Teachers of students enrolled in hospital and/or homebound programs are generally itinerant and serve learners of varied cognitive levels. However, there may be instances when teachers of retarded learners have students enrolled in their classes who require temporary or in some extreme cases permanent services of this nature. Hospital instruction is generally considered for learners who are confined temporarily in a hospital because of an illness or accident that requires continuous medical treatment. The student's stay in the hospital must be long enough that it interrupts the educational program (Reynolds & Birch, 1977).

Homebound instruction is designed for learners who must be confined to home for long periods in order to recover from an illness or accident. If the period of recovery is sufficiently long that it interrupts the educational program, a program designed to bring the instruction into the learner's home is required.



To minimize the problems of generalizing skills from the hospital/homebound (H/H) setting to the classroom and vice versa, the classroom teacher should plan on both introducing the initial lessons at the beginning of the H/H program and returning at the end just before the student is to return to school.

- If an extended absence from school is known about beforehand (e.g., notice of a pending operation), the itinerant teacher can participate in classroom lessons before the student leaves school. The itinerant teacher thus has a chance to work with the learner in a familiar environment and under the direction of the classroom teacher.
- Peer tutors can greatly enhance the generalization of skills between settings (Stokes & Baer, 1977). Other students who live in the H/H student's neighborhood might be able to participate in study sessions in the H/H setting.

In most cases, teachers of retarded learners probably would not provide direct instruction to hospital/homebound students; however, as coordinator of the learner's program, the responsibility to monitor and assist with program development lies with the classroom teacher. There are a number of considerations that, once addressed, could improve the effectiveness of these programs.

A hospital/homebound program must, by its nature, be considered a more restrictive alternative because of the learner's isolation from his or her peers. Teachers may have the opportunity to keep in close contact with medical specialists and help them to realize the need for the learner to return to school as soon as is medically feasible. Also, to minimize the effects of prolonged isolation from peers, teachers can (with the permission of medical specialists and parents) develop class activities that allow small groups of these students to participate with the student in the home at regular intervals. The classroom teacher should maintain continual contact with the itinerant teacher providing the hospital/homebound instruction. The continuity of the program can be established by the two teachers when a minimum of weekly meetings are scheduled to analyze student progress, revise instructional techniques, and update objectives where necessary.

A Model for Teachers in Residential Settings

A residential placement setting (e.g., state institution, intermediate care facility (ICF), or private school) may be the least desirable placement option for most retarded learners because these facilities are the most segregated from the general mainstream of society. The preferred trend in education and medical care is to provide these learners with smaller environments closer to the individual's home, as opposed to large state institutions, in an effort to maintain contact with the natural family (Menolascino & McGee, 1981).

Until the time when smaller, local facilities become available on a widespread basis, residential educational programming will still be provided in large institutional settings. Teachers employed to instruct retarded learners under these conditions usually function in one of two ways. First, and less prevalent, are teachers who conduct their instruction on the medical wards for learners whose medical needs are so great that they cannot leave the ward without the potential threat of death. This placement alternative differs from hospital instruction as explained in the last section because it involves a permanent placement.

A second option for instruction within the institutional setting involves teaching in a special school or center, usually on the grounds of the facility. The student population generally enrolled in these settings falls into one of two categories: (1) school-aged learners suffering from multiple handicaps in addition to severe and profound mental retardation and (2) older residents who have spent the greater part of their lives in institutional settings and who for varied reasons have not been integrated into the community (Vitello, Atthowe, & Cadwell, 1983).

The skills required to manage the physical environment of the instructional setting become increasingly more sophisticated with the new and innovative placement options that are being designed by teachers. The following sections present teachers with suggestions for assessing and then designing the physical environment in order to increase the efficiency and effectiveness of instruction.



KEY CONCEPTS



- Hospital/homebound teachers are generally itinerant.
- Teachers can invite H/H teachers to visit their classes to observe the types of activities the student was engaged in prior to the illness.
- The classroom teacher should provide the H/H teacher with activities, materials, behavior change programs, and assessment devices.
- Teachers in residential settings often teach in self-contained schools located on the grounds of large state institutions.

PHYSICAL MANAGEMENT OF THE INSTRUCTIONAL SETTING

Instructional environments can be located anywhere teachers decide learning is to take place. Traditionally, professionals have considered the classroom as the area where teaching occurs; however, the trend is now moving toward recognizing community locales as appropriate instructional environments (Landesman-Dwyer, 1981; Schalock, Harper, & Genung, 1981). The concept of arranging the

physical environment to facilitate learning is an important aspect of the program development process (Lindsey, 1964; Payne, Polloway, Smith, & Payne, 1981). Arranging the instructional environment goes beyond moving desks and chairs. Other considerations for designing an efficient learning environment include scheduling, developing group and individual activities, using equipment, and developing learning centers.

Arranging the Physical Environment

When arranging the physical environment of the classroom teachers should develop an overall plan (including diagrams), allowing a maximum use of space while keeping materials centralized to minimize teacher movement. Valuable instructional time may be wasted when a teacher has to stop a lesson to retrieve materials in another part of the room. Peter (1975) has suggested that teachers arrange the classroom in relation to the room's fixed features (doors, windows, closets), functional relationships among areas (study sections away from activities producing higher noise levels), and primary pathways (efficient planning of student traffic routes).

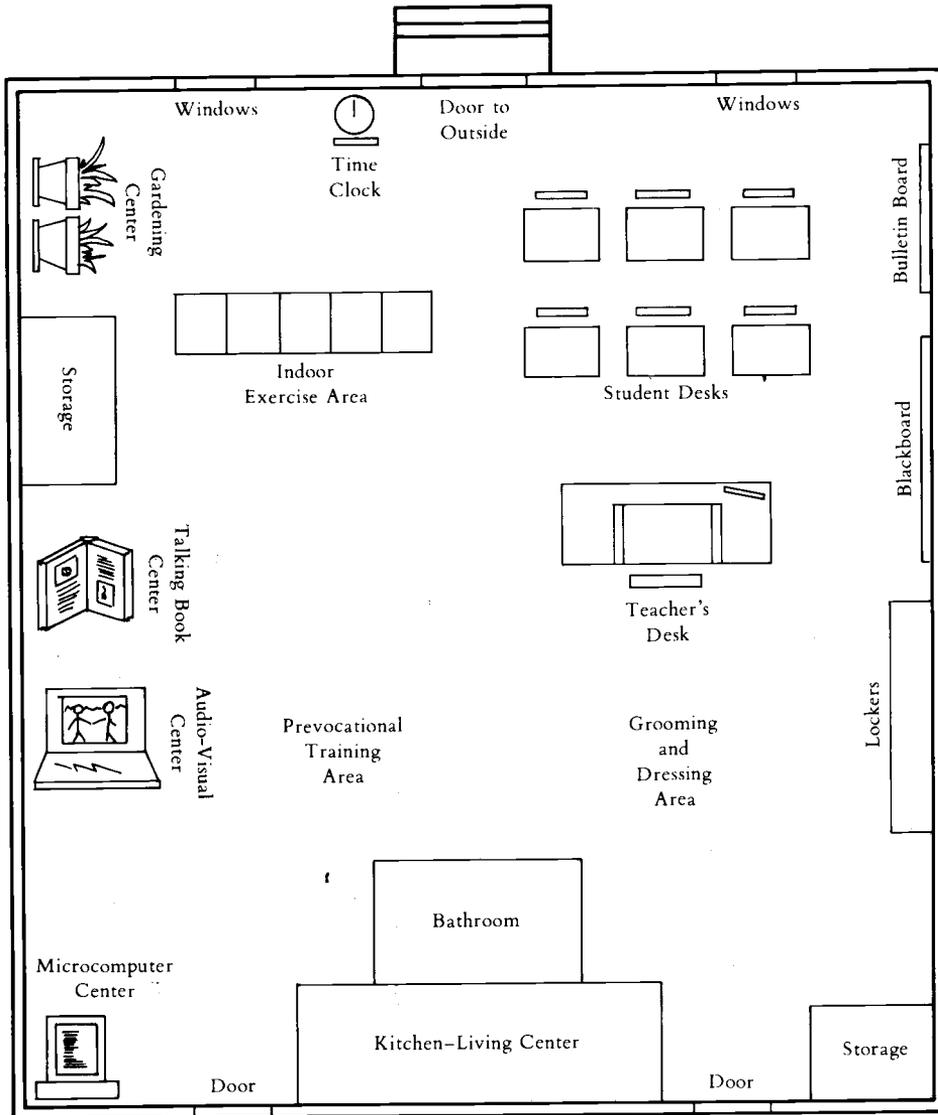
The fixed features of a room become important when the requirements of specific activities are considered. For example, an area of the classroom designed for teaching prevocational skills (e.g., assembly line tasks, woodworking) would need a large storage area. The location of this section should be near a closet. Similarly, the section for teaching self-care skills should be located in an area near a sink, bathroom, or shower.

Arranging centers in relation to their functional characteristics is also an important consideration. High rates of activity (group math lesson) versus low rates of activity (individual reading center) should be separated as far as possible. Centers that require sharing materials, such as a library center and study carrels, should be located close together. Figures 2.1 and 2.2 provide an illustration of classroom floor plans that teachers may wish to use as models.

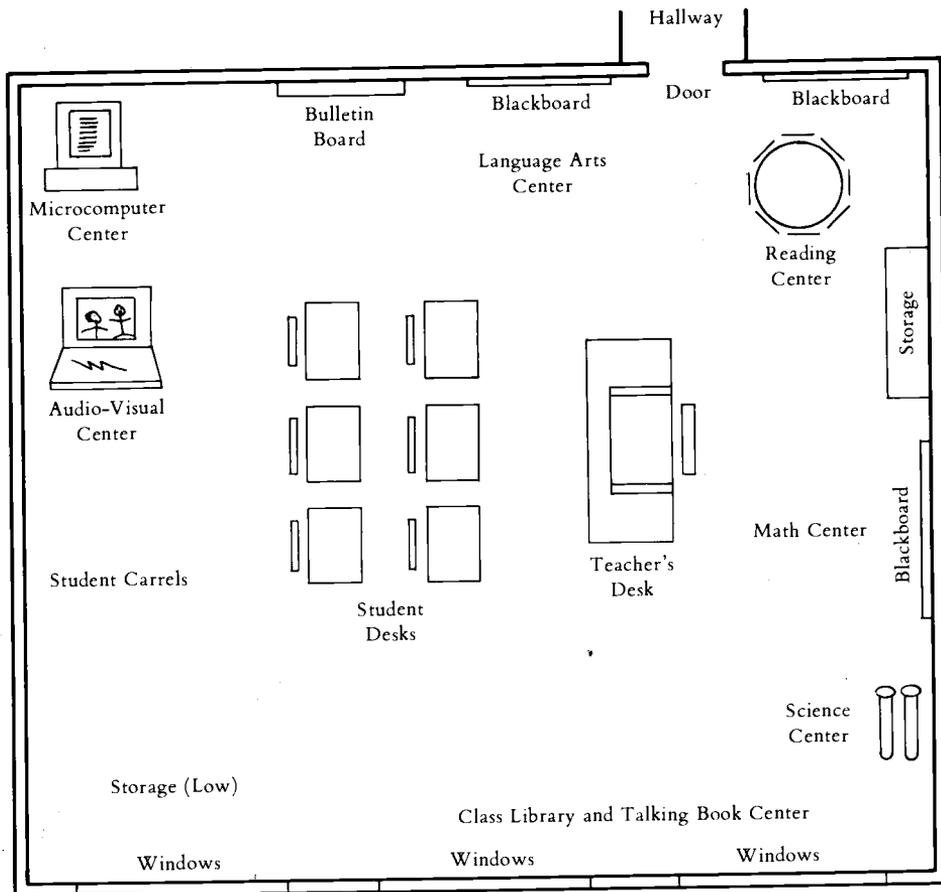
Planning efficient traffic patterns can save both the teacher and the learners valuable time and steps. For example, an activity requiring students to leave the room at varying intervals to retrieve water from the hallway lavatories might be located near the class entrance. This eliminates the need for students to move through other activities to reach the door. Activities can also be located so that teachers or other supervisory personnel in charge of a number of duties can easily manage those areas without crisscrossing the room. Various learning centers in the room should be located to facilitate orderly movement (Peter, 1975). In an attempt to maintain order, teachers at times may misinterpret this goal and arrange their classrooms in traditional fashions that discourage student movement (Rich, 1980). These efforts may, at best, simulate an environment very different from what occurs in vocational and other community settings. Instead, a classroom should be designed to teach and then allow maximum freedom and responsibility on the part of the students.

Classrooms should be designed to facilitate the teacher's ability to scan the

class with maximum efficiency (Hart, 1981). The teacher must have an unobstructed view of all areas of the room at any given time. For example, teachers can train students to react to eye contact as a reminder to return to a task. Thus, an important feature of the classroom structure is to allow maximum eye contact between the teacher and students from any point in the room. There are a number of reasons for maintaining close visual contact with students, the most important being safety. If students engage in unsafe activities or are involved in physical



■ FIGURE 2.1
Potential Classroom Floor Plan (Self-Contained)



■ FIGURE 2.2
Classroom Floor Plan (Resource)

altercations, teachers with an unobstructed view may be able to react more quickly.

Scheduling

Developing an efficient time schedule is a skill that is invaluable for teachers. Downtime in the classroom can be a chief contributor to poorly managed programs where a number of inappropriate behaviors can occur (Laycock, 1980). (Downtime refers to times when little or no instruction occurs, and it does not allow students the knowledge of what to do or what comes next.) Consequently, teachers must consider the length of lessons, times of day more appropriate for teaching specific skills, and time blocks for individualized instruction as well as group instruction.

Time schedules can be used as learning tools as well as organizational aids. For example, a teacher may begin by scheduling daily activities consistently so that learners can benefit from the support of a structured environment. Activity in the community, however, does not exist in neatly arranged time blocks. Accordingly, teachers could plan deliberate changes in the schedule over time, thus promoting flexibility in the learners (Hart, 1981). This does not mean schedules should be disorganized so that students are in a continual state of confusion. Rather, planned change allows retarded students to gain skills in dealing with sudden alterations in schedules appropriately and in an orderly fashion. (See Figures 2.3 & 2.4.)

In addition to planning schedule changes as an instructional tool, teachers can design activities to teach learners organizational skills. Retarded persons may not become responsible citizens if others tell them when to awake, when to eat, and when to go to the bathroom. Instead, teachers can use scheduling as a vehicle for

	CALVIN	SHANNON	KEN	DONNA	MALIKA	WAYNE	TOM	ROBERTO	MIKE	SUE
7:40-8:00 a.m.		Work-Site Cafeteria _y				Work-Site Cafeteria _z			Work-Site Cafeteria _z	
8:00-8:30	Bus Arrives Breakfast _j	↓	Arrives	Arrives	Arrives Breakfast _j	↓			↓	Arrives Breakfast _j
8:30-9:00	Hospital _D	Vocational Education	Hospital _D	Hospital _D	Microcomputer Language _D	Vocational Education	Arrives	Arrives v	Care for Plants-Room _z	Hospital _D
9:00-9:30	Worksite	Horticulture _r	Worksite	Worksite	Program	Horticulture _s	Pedestrian Skills _i	Pedestrian Skills _j	And School	Worksite
9:30-10:00	(Bus-Riding)		(Bus-Riding)	(Bus-Riding)	St. Joseph's Church*				St. Joseph's Church*	(Bus-Riding)
10:00-10:30	↓		↓	↓	Custodial Skills				Custodial Skills	↓
10:30-11:00	↓		↓	↓		Home Management _j	Home Management _j			↓
11:00-11:30	Restaurant Skills _D		Restaurant Skills _D	Restaurant Skills _D		Cooking	Cooking			Restaurant Skills _D
11:30-12:00	Fast-Food	↓	Fast-Food	Fast-Food	Microcomputer Language _C	↓	↓	↓	Sight Vocabulary	Fast-Food
12:00-12:30	P.E. or Calculator _B	Lunch J & C	P.E. or Calculator _B	P.E. or Sight Words _A	Lunch J & C	Lunch J & C	Lunch J & C	Lunch J & C	Lunch J & C	P.E. or Calculator _B
12:30-1:00	Vocational Education	Nursing Home _f	Leisure Recreation	Vocational Education	P.E. or Leisure/ _{RA}	Nursing Home _f	Nursing Home	Nursing Home _f	P.E. or Leisure/ _R	Microcomputer Functional Reading
1:00-1:30	Child Care _N	(Bus-Riding)	Video-M Games	Child Care _N	Gardening _A	(Bus-Riding)	(Bus-Riding)	(Bus-Riding)	Gardening	
1:30-2:00	↓				Shopping Skills _D				Shopping Skills _D	Shopping Skills _D
2:00-2:30										
2:30-3:00	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
3:00-3:30	Leaves	P.E. or Leisure	Leaves	Leaves	Leaves	P.E. or Leisure/ _R	P.E. or Leisure/ _R	P.E. or Leisure/ _R	Leaves	Leaves

*Attends worksite with Ms. Jones' (Teacher) Group.

*Attends worksite with Ms. Jones' Group.

- D = Diane (Teacher)
- B = Bonnie (Peer Tutor)
- S = Sam (Peer Tutor)
- A = Angela (Parent Volunteer)
- J = Jim (Aide)
- T = Tom (Peer Tutor)
- P = Pam (Peer Tutor)
- M = Mary (Parent Volunteer)
- C = Cathy (Aide)
- F = Frank (Peer Tutor)
- K = Kay (Peer Tutor)
- N = Nancy (Peer Tutor)

FIGURE 2.3
Sample Schedule (Self-Contained Class)

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:45-9:00	Bobby, Lin,	Juan-Handwriting	Bobby, Lin,	Juan-Handwriting	Bobby, Lin,
9:00-9:15	Jamal, Karen	Telisa, Pam,	Jamal, Karen	Telisa, Pam,	Jamal, Karen
9:15-9:30	(Reading)	Jim	(Reading)	Jim	(Reading)
9:30-9:45	Ricky, Ken,	(Math)	Ricky, Ken,	(Math)	Ricky, Ken,
9:45-10:00	LaRonda, Pam,	Telisa, Pam,	LaRonda, Pam,	Telisa, Pam,	LaRonda, Pam,
10:00-10:15	Deimetris	Jim, Susan	Deimetris	Jim, Susan	Deimetris
10:15-10:30	(Written Exp.)	(Shopping Skills	(Written Exp.)	(Shopping Skills	(Written Exp.)
10:30-10:45	Bobby, Lin,	Community)	Bobby, Lin,	Community)	Bobby, Lin,
10:45-11:00	Karen, Ken,		Karen, Ken,		Karen, Ken,
11:00-11:15	LaRonda		LaRonda		LaRonda
11:15-11:30	(Math)		(Math)		(Math)
11:30-11:45	Tim-Spelling		Tim-Spelling		Tim-Spelling
11:45-12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
12:30-1:30	PLANNING PERIOD	
1:30-1:45	Juan, Bobby,	Kurt, Kevin,	Juan, Bobby,	Kurt, Kevin,	Juan, Bobby,
1:45-2:00	Lin, Ricky,	Paula, Sally	Lin, Ricky,	Paula, Sally	Lin, Ricky,
2:00-2:15	Deimetris	(Written Exp.)	Deimetris	(Written Exp.)	Deimetris
2:15-2:30	(Functional	Josh, Peter	(Functional	Josh, Peter,	(Functional
	Reading		Reading		Reading
2:30-2:45	Community)	Diane, Megan	Community)	Diane, Megan	Community)
2:45-3:00	Tom-Reading	(Lang. Arts)	Tom-Reading	(Lang. Arts)	Tom-Reading
3:00-3:30	Bus Duty
3:30-4:00	Meet With	Regular	Education	Teachers

■ FIGURE 2.4
Sample Schedule (Resource Room)

instructing one facet of responsible living. For instance, a higher level goal for students involves obtaining a list of tasks at the start of the day that must be accomplished before the end of school. The learner, then, would develop his or her own daily schedule around those tasks, keeping in mind the regular daily activities required of the total group. Retarded learners trained in developing such management systems gain an important skill for independent living.



IDEA FILE



First-year teachers may find it difficult to set up their first class schedule. There are many different approaches to scheduling, and teachers should experiment with a number of them until they find one that meets their needs. The following steps may prove helpful for developing a basic schedule:

- Teachers should first decide what lengths of instructional sessions best meet their students' needs. For example, younger or more severely retarded learners with shorter attention spans require shorter instructional periods. Some activities may

require longer sessions, which may affect the schedule. To start, teachers may wish to divide the school into half-hour sessions then adjust the sessions as student need and activity length dictate. (Before dividing the day into sessions, teachers should subtract the times for set activities such as lunch, physical education, art, and recess.)

- Grouping learners is an important part of scheduling (see the next section). The first step in grouping involves the physical management of a given number of students. Teachers can divide the number of students present in the class during a session by the total number of instructional personnel (e.g., teacher, aides, peer tutors). This calculation will give the teacher an idea of the ratio of students to instructors. For example, if there are 20 students in the classroom from 10 a.m. until 10:30 a.m. and only a teacher plus one aide, the ratio is 10 to 1. If the teacher wishes to teach a reading group of six students the ratio of students to aides increases to 14 to 1. At this point, a teacher may wish to schedule help from a peer tutor or volunteer so that the students not engaged in group work will have adequate supervision while they are working individually or in centers.

Grouping Learners

Programming for the individual does not eliminate group instruction. Factors such as dwindling resources and teaching students to work as members of a team make grouping a must. Teachers should consider moving beyond grouping by ability and consider grouping according to the complementary skills of the learners.

Small group instruction can be implemented in one of two ways, depending on the activity. First, an activity may require that each group member complete a task that contributes to a total group product. For example, a group of severely retarded learners might be learning the skills necessary for completing assembly line tasks, each student required to complete one section of the assignment.

The second method of grouping involves meeting the needs of individual students while in the confines of a group, where what the learners share in common are the subject and physical proximity. For example, a group of four mildly retarded students may be working with the teacher on computation objectives. The learners may be at varying levels, requiring the teacher to spend small amounts of time individually directing each student. The primary concern is that the teacher arrange the physical space for delivery of prompts/cues and reinforcers. This arrangement may be advantageous, because the teacher can instruct and direct more learners simultaneously while allowing them to work at their own levels.

Commercially produced materials can be helpful in deciding on how to group learners. A reading program allowing the teacher to work with a more diverse group of students may be more efficient, because the teacher can increase the size of the group. Mildly retarded students come to school with many deficit areas and, in a sense, can each use individually designed lessons. Because of their numbers, this would be an improbable task for one teacher, so good commercially produced programs can be invaluable for teaching groups of students who need to learn similar skills.

Individualized instruction that allows a teacher to work one-to-one with a learner is difficult to schedule. However, this form of instruction should not be overlooked, and short periods of time during the day can be scheduled for it. Teachers who locate their desk in a central location (to maintain maximum visual scan) can call specific students to them for individualized instruction in new skills. The time allotted per student may be minimal; however, if the session is carefully planned a great deal can be accomplished.

Classroom Equipment and Learning Centers

A wide variety of audiovisual equipment, microcomputers, and other instructional aids is available that can be highly effective for use with retarded learners. Commercial catalogs are one source for identifying these resources, and another is exhibits at professional conventions. Retarded learners have strengths and weaknesses in different instructional modalities, as do all learners, and matching the appropriate equipment to those needs is important. Learning centers are often built around individual themes specified by the portion of curriculum being emphasized. Hence, a classroom may be equipped with centers dealing with such subjects as career education, science, prevocational skills, math, reading, and self-care skills. The efficiency of these centers can be improved if teachers incorporate equipment into them that can be used to individualize instruction. For example, a tape recorder incorporated into a reading center can allow students to practice skills using talking books and taped lessons.



Computers and other instructional aids can be highly effective in the classroom environment. (Courtesy of DLM Teaching Resources, Allen, Texas)

Structuring Learning in Community Settings

Teachers of retarded learners will eventually be increasing time spent in community instruction. Each of the areas previously discussed has implications for developing community-based learning activities. For example, arranging the physical environment would be important for teaching street-crossing skills to retarded learners. In this case, teachers can enlist the aid of law enforcement officials for controlling traffic.

Similarly, when designing community-based activities teachers should consider the need for efficient scheduling and grouping of students. Scheduling problems will have to be worked out on an administrative level in order to make available the necessary personnel. Scheduling the assistance of more able learners to assist the less able ones can provide valuable help. Using teams of students to work on problems or practice learned skills involves careful planning and matching of group members.

Good teachers demonstrate many superior competencies, including those described in this section. They also demonstrate superior qualities in their relationships with people. The following section presents issues and techniques for improving a teacher's professional relationships as well as improving the efficiency of support staff.



KEY CONCEPTS



- Carefully arranging the teaching environment (e.g., classroom, community work sites) increases the probability that learning will occur.
- All space in the classroom should be used efficiently. Traffic patterns should be considered that allow freedom of movement to all areas. In addition, equipment and furniture should be arranged to allow observation of students from any point in the room.
- A well-designed schedule is vital. Teachers need to be able to schedule frequent trips to the community with small groups while scheduling the remainder of the class in school-based activities.
- A small group is the most efficient method of teaching many skills.
- Groups involved in community-based training often work well when students with different problems are represented.

OTHER TEACHER COMPETENCIES

An interesting phenomenon may occur when groups of teachers from various disciplines gather together for cross-training workshops. Special educators may have a great deal of difficulty describing their specialty areas to others. Regular

education teachers generally find this task easier, because most specialize in one or two content areas (e.g., math, science). Special educators, however, are not always specialists in subject areas, and the skills and competencies they possess are much more ambiguous.

There are basically three broad competency areas in which many teachers of the mentally retarded are proficient: assessment and diagnosis, curriculum development and modification, and applied behavior analysis. A teacher of retarded learners should be able to use a variety of both normative and criterion-referenced assessment tools (described in Chapter Four) to pinpoint a student's strengths and weaknesses. After the information from these assessment strategies is gathered and closely analyzed, the teacher should be able to identify each student's major strengths and weaknesses.

Special educators should also be proficient in skills related to designing instruction based on student need. They should be capable of breaking down instruction into component parts and expert in monitoring student progress.

Finally, teachers of retarded learners should develop competencies involving behaviorally oriented instructional programs. This system allows teachers to precisely define target behaviors; conduct frequent and accurate measurements of defined behaviors; apply instructional procedures or materials designed to change the students' behavior; measure change; and revise the program where necessary.

The ability to describe these competencies to other teachers is an important starting point for establishing cooperative relationships. For example, a vocational educator teaching a mildly retarded learner may need help in identifying the learner's academic strengths and weaknesses and matching a module format to those needs. The special educator could provide the competencies of criterion-referenced assessment and curriculum modification to support the vocational educator. Similarly, a special educator may lack the necessary content expertise to develop activities for severely retarded learners that reflect skills similar to those in industrial settings. A vocational educator can provide the technical expertise, materials, and community contacts needed to develop more appropriate curricular options. Other teacher competencies that appear to be vital to program success involve the ability to use and schedule paraprofessionals, volunteers, and materials to maximize instructional time, and the ability to deliver appropriate consequences based on observed learner behaviors (Boomer, 1982; Fredricks, Anderson, & Baldwin, 1977). In addition, special educators may be called upon to provide inservice training for regular educators mainstreaming handicapped students into their classes. In any event, before teachers can bring skills and knowledge to a team effort, they first must have a strong grasp of what they can and cannot do.

Management of Other Instructional Personnel

A problem faced by some teachers is the need for additional classroom personnel. Unfortunately, it is unlikely that there will be large amounts of funds available to hire additional staff in the future. More efficient use of existing personnel may prove to be the best long-term solution. Efficient use of instructional support

personnel is much like good teaching; that is, teachers must have clearly stated objectives for what their assistants are to accomplish (Lombardo, 1980). This approach to management is accomplished by devising a written plan for each individual providing instruction for learners. This plan should be developed in a combined effort between the teacher and the assistant, with the assistant providing input into the objectives.

Scheduling other instructional personnel efficiently is the first step toward developing a good management system. Lieberman (1982) has suggested ways to cut down on the travel time of children (thus cutting down their learning time) by scheduling their activities closer together in the school. Efficiently managing a volunteer's or paraprofessional's time can involve similar scheduling practices.

Teachers may provide assistants with only verbal instructions, assuming that the assistant can follow through with the task, or they may have more success using techniques such as modeling and prompts to demonstrate what they want the assistant to do. Frequent observations of the assistants can provide information for helping them to improve their skills.

Teachers can choose to use additional techniques for managing the effectiveness of other instructional personnel, such as self-charting and public posting (see Chapters Five and Six). Various schedules of reinforcement are also important considerations for managing instructional assistants. Teachers may have more



success at improving the effectiveness of their assistants if they provide them frequent reinforcement and feedback concerning the quality of their work.

Scheduling frequent staff discussions is an important consideration for managing other classroom personnel. A 15-minute daily meeting after school to review the day's occurrences is often all the time needed to review and improve instruction. It is often easier to handle problems when they are addressed as quickly as possible after they occur.

Teacher Aides and Paraprofessionals

There are a variety of labels that are used for individuals paid by a school district to assist teachers. For example, titles such as *teacher aide*, *teacher assistant*, *instructional assistant*, and *paraprofessional* are all common terms describing other classroom personnel. Many teachers of retarded learners have an aide of some type, ranging from full-time assistant to varying levels of part-time help. The formal educational requirements for these positions vary from school district to school district; however, the basic requirement is generally a high school diploma.

Paraprofessionals, who often have degrees from community colleges or technical schools, can accomplish a variety of tasks that support the special educator, including managing students, providing basic instruction, and acting as members of the educational team (Goff & Kelly, 1979). Paraprofessionals and teacher aides can be invaluable, and teachers should guard them from being underused or inappropriately assigned tasks that lessen both their effectiveness and efficiency. Teachers can avoid problems by precisely defining the roles of instructional assistants.

There may be some confusion as to whether an aide should perform only noninstructional duties or provide direct teaching to the learners (Peter, 1975). Some teachers may decide to use aides only for noninstructional tasks that in many cases are ones that teachers would not consider doing themselves. This situation can hinder the development of a mutually beneficial relationship between teachers and aides. First, the aides may feel that they are only to do the teacher's "dirty work," possibly resulting in their developing less than effective work habits. Second, by adhering to the noninstructional role policy, teachers may be losing a most effective vehicle for providing individual instruction to retarded learners.

Barriers can also exist between teachers and aides if they allow age differences to adversely affect their working relationship. For example, most preservice teachers entering the field and many existing inservice teachers have to establish working relationships with aides who are older than themselves. Under these circumstances, teachers may be uncomfortable in a supervisor-subordinate relationship with their aides. This attitude of teachers may result in their providing little concrete direction to assistants, hoping they will find something useful to do. Any requests made by the teacher are made carefully in an effort to avoid hurting the aide's feelings.

An important factor for establishing a good working relationship with an aide is the ability to establish rapport on a personal level and to feel comfortable

with the individual (Marsh & Price, 1980). When teachers do not participate in choosing an aide it is necessary to establish a good working rapport on the first meeting day. Greer (1978) has suggested that the teacher firmly establish that the aide is an important part of the educational team, with the stipulation that the aide must “take no independent action, and have no decision making authority” (pp. 3–4). Making these basic facts clear will help set the tone for the future of the relationship.



IDEA FILE



Whether or not aides and volunteers become effective instructors often may depend upon the extent to which teachers train them in the appropriate classroom procedures. For instance, a brief training program and periodic review sessions can assist other classroom personnel in learning skills needed to observe student behavior in a consistent manner.

- The teacher might consider developing a training manual that explains how to deal with certain behaviors and implement specific classroom procedures (Marsh & Price, 1980). This technique can save lengthy discussions while providing the assistant with a guide for those times when the teacher is unavailable for help. The manual can be more helpful to assistants if snapshots or drawings are included depicting the teaching technique being explained.
- Assistants may be more willing to implement programs if they have been included in the planning (Hart, 1981). Short daily meetings between teachers and assistants can be a good method for correcting problems and sharing ideas.
- These short meetings should be a dialogue *between* the teacher and assistant, not a one-sided conversation presenting all of the teacher’s ideas.
- Teachers should develop daily schedules for their assistants and post them where they can frequently refer to their responsibilities.
- The following is a partial list of appropriate tasks for assistants:
 - Perform clerical tasks.
 - Observe, record, and chart student behaviors.
 - Implement behavioral programs (e.g., self-feeding program).
 - Assist learners in academic skill practice or generalization.
 - Help learners generalize independent living skills to community settings.

Volunteers

Volunteers are an often overlooked source of classroom assistance that can potentially provide a wealth of instructional talent for retarded learners. Developing a good volunteer program involves careful planning and scheduling.

Teachers may find it difficult to implement behavior analysis programs because of the need for independent observers. Volunteer parents can assist teachers by learning to monitor the behavior of the target learners. For example, a teacher may ask a parent to participate as an observer in a program designed to eliminate the self-stimulatory behavior of a student. The main thrust of the program may only last 2 weeks, allowing the teacher time to evaluate a number of interventions and choose the one that has the most success. The following steps are examples of those that might be used to train the parent in correctly observing the target behavior:

1. If possible, videotape the learner engaged in the behavior. Using the videotape, the parent can practice observing and recording the behavior.
2. When videotaping is not possible, allow the parent to observe the student and practice recording the behavior a number of times before actual data are charted.
3. During either the videotaped or classroom practice sessions check the progress of the parent by initiating a reliability check at specified intervals (see Chapter 6).
4. When the parent and reliability checker agree at least 80% of the time, begin collecting actual baseline data.

For many behaviors that parent volunteers may be called upon to observe, detailed training such as this may not be necessary. Nevertheless, whether the task requires intensive training or simple instruction, the benefits of the additional help are many.

Parents and other volunteers can also be of immense help in performing a wide variety of other tasks. Assisting in activities such as charting data, escorting learners on community instruction trips, and teaching self-care skills are additional suggestions for the use of volunteers. Using parents as classroom assistants has two added benefits. First, the communication between the school and home is enhanced because the parents feel a part of the process and have a vested interest in the program. Second, teachers can make use of this time with parents to instruct them in preferred teaching practices that can be used at home (Gallagher, Beckman, & Cross, 1983). During this time in school parents may become more comfortable with the teacher and provide valuable input into the program.

Besides parents, there are other volunteer resources available in communities. Teachers can approach church groups, service organizations, and specific community members to act as instructional assistants. Take, for example, a local retailer who may assist by allowing retarded learners to practice consumer skills in his or her store. Similar examples could be securing the assistance of salespersons, personnel managers, and bus drivers. The help is available to institute a number of innovative program options if teachers are willing to seek it out and provide the necessary leadership and coordination skills.



IDEA FILE



Following are some general suggestions for more appropriate use of volunteers of all types:

- Be sure to schedule volunteers to assist when they are the most needed.
 - Keep a master schedule posted to minimize the overlapping of volunteers.
 - When volunteers arrive, be sure that a list of tasks awaits them.
 - Take time to train volunteers in the techniques they are to use and in the rules of the class.
 - Use principles of applied behavior analysis to monitor the actions of volunteers. Observation, public posting, and self-charting are useful techniques to use with these assistants (see Chapters Five and Six).
 - Approach service organizations and church groups, and volunteer your services as a speaker for their meetings. A slide show demonstrating a class in action, followed by a discussion of program goals, is a good public relations tool and may encourage potential volunteers.
 - Carefully interview each volunteer, selecting only those who appear to be dependable, punctual, flexible, and emotionally stable (Lombardo, 1980). Prior to interviewing prospective candidates, teachers should list the qualities they wish the volunteers to have, so they can compare the candidates to the list.
 - A job description completed prior to interviewing candidates can help candidates to decide whether or not they would like to participate.
-

Peer Tutors

Peer tutoring began to gain more acceptance in the late 1970s as increased numbers of handicapped students were being mainstreamed into regular classes. The results of several studies indicate that peer tutoring can be an effective method for helping mildly handicapped students acquire specific skills (Dale, 1979; Ehly & Larsen, 1980).

Peer tutors can come from a number of sources both within special education and from general education classes (Morsink, 1984). Tutors from within the teacher's classroom can be the first source of these assistants. Older and/or more able learners can be used in a number of instructional situations. For example, resource room teachers may choose to pair off learners, allowing students who have mastered specific academic skills to help others who have not. Similarly, teachers of moderately and severely retarded students may assign learners who are proficient in workshop-related skills to supervise students who are in the process of obtaining those skills.

Another alternative is to make use of the talents of students from other special education classes to assist as peer tutors. Programs allowing learning disabled or behavior disordered students to participate as tutors for retarded learners are becoming popular. These program options can often present a student the opportunity to learn responsible behavior by helping others if the opportunity to tutor is regarded as a privilege earned by demonstrating predetermined appropriate behaviors.

Many classes for the mentally retarded are now closer to the mainstream of

public education. The opportunity exists to incorporate the use of general education students as peer tutors for retarded learners. These general education students can provide excellent assistance in tutoring academic, self-help, and vocational skills. Equally important is the opportunity such options allow for the general population to learn appropriate interactions with retarded learners (Poorman, 1980).

Peer tutors can also be a factor in facilitating better generalization of the skills learned by retarded students. For example, peer tutors who reside in the same neighborhood as the target learner can assist that student in transferring skills learned in school to the learner's natural environment. Specifically, a peer tutor who has participated in a program designed to teach shopping skills to a moderately retarded learner can accompany the student to neighborhood grocery stores and assist in generalizing the shopping skills to new environments.

Teachers may wish to consider the following suggestions for recruiting peer tutors:

1. Teachers must thoroughly plan a peer tutor program, including objectives and types of skills to be targeted and then presenting the outline to the school principal. Winning over the administration may stimulate more teachers to participate in the program.
2. Teachers can present this idea immediately to any general education teacher who will be working with a retarded learner. The topic can be approached as a method for taking some of the pressure off the regular education teacher.
3. Teachers can present the idea to other teachers who are club advisors. Parents or cooperative extension agents who are in charge of 4-H programs are also likely sources of help in identifying potential peer tutors.
4. If club advisors agree, teachers can speak to the members, explaining the program goals and presenting information about people who are mentally retarded. Using slides of special education classes can augment the presentation.
5. Teachers should enlist the support of parents early in the development stages, asking for time during PTA meetings to present the format of the tutoring program.
6. Being careful to adhere to school district policy, teachers can use the media for public relations purposes. A story about the benefits of the peer tutoring program can elicit additional support from the community and other school personnel not currently participating.
7. Teachers should take time to carefully schedule the tutors and train them prior to their contact with the learners, making sure they understand their assignments.

University or College Classroom Assistants

For some teachers, the use of university or college classroom assistants is not a pressing concern. For teachers who do interact with these individuals, however, there are some basic suggestions for effectively using them that may prove helpful. First, student teachers (interns) can be a great asset to teachers, becoming an "extra pair of hands" and providing support to students that might otherwise be unavail-

able. Scheduling a student teacher's duties should reflect a gradual increase of responsibility, moving from small groups to eventually spending a period of time programming for the entire class.

1. Teachers should make a list of the skills they would like the student teachers to gain during the internship.
2. Teachers can require the student teachers to list the skills they would like to attain during the internship.
3. Teachers and interns should translate both lists into behavioral objectives that are to be completed by the end of the quarter or semester.
4. Teachers can schedule short daily sessions with the student teachers to discuss problems or concerns as well as allowing the interns to contribute ideas to program development.
5. Teachers should define the desired student teacher behaviors operationally and observe/record/chart those behaviors while the student teachers are implementing lessons (Chapters Five and Six). These techniques will help the interns get a clearer idea of their performance on a daily basis.

Teachers should give serious consideration to evaluating the quality of their contacts with the student teachers' college supervisors. Problems can arise when a college supervisor maintains only a minimum of contact with both the intern and the teacher. This situation is not desirable since the college supervisor presumably has the knowledge to assist the intern in translating the best practices from the college curriculum into daily instructional methods. Therefore, teachers should consider the following points that may help to foster a better professional relationship:

1. At the initial meeting, the teacher can request a list of objectives required by the supervisor and share the list of teacher-developed objectives.
2. The teacher can request that the supervisor visit for at least half of the school day when observing the intern. At the end of the observation a short session can be scheduled to discuss any points of concern with the supervisor and the intern.
3. The teacher can schedule frequent evaluation sessions that allow for a sharing of data between the college supervisor, teacher, and intern.

Developing a professional relationship with another person may not be an easy task. College supervisors are sometimes perceived as being superior to the classroom teacher, an image that can be fostered by either the supervisor or the teacher. Instead, the goal should be to become a team, each providing skills to improve the quality of the student teacher. To accomplish this and other workable professional relationships, teachers must be adept at certain competencies that allow them to be efficient with their own time and assertive enough to accomplish their goals. With these considerations in mind, the following section briefly presents additional competencies designed to assist teachers in developing effective professional relationships.

COMPETENCIES FOR EFFECTIVE INTERACTIONS WITH OTHER PERSONNEL

Effectiveness as a teacher is not restricted to performing skills geared to instructional intervention, but also involves learning skills needed to become better managers. Teachers of retarded students are increasingly called upon to interact with many individuals. Two areas where they generally need to improve their skills are assertiveness and time management.

Assertiveness

The ability to be assertive involves a positive approach to dealing with others. Interacting with other professionals may place the special educator in a low power position, that is, accepting the judgments of administrators, psychologists, physicians, and/or parents. How a teacher reacts to these attempts at control can result in either self-denying (nonassertive), assertive, or aggressive behaviors. Unfortunately, if teachers resort to either self-denying or aggressive behaviors it can cause others to ignore the good ideas they may have regarding a student's program. Baer (1976) distinguished between assertive and aggressive behavior by defining assertiveness as those traits that allow people to stand up for themselves and make their own choices. Conversely, aggressiveness is an attempt to enhance one's own position at the expense of someone else's rights. In contrast to either of these approaches, nonassertive people allow others to make their decisions and guide their actions, usually at the expense of their own self-esteem (Alberti & Emmons, 1974; Dyer, 1979). A great deal of stress can be placed on individuals who either continually allow others to dictate to them or alienate colleagues through aggressive actions.

Assertiveness is the ability to state a point of view or make a request in a positive, plain, and strong manner. The key is that the affirmation is made clearly and is based on a well-thought-out set of logical statements. For example, a school psychologist may inform a teacher that his or her findings support the decision to place a mildly retarded learner in a self-contained class. Accepting this judgment without question or vehemently arguing against the placement will probably not bring about a satisfactory conclusion. Conversely, if the teacher practices assertive techniques he or she can calmly but firmly convey to the psychologist agreement or disagreement with the finding, subsequently supporting the teacher's own position with data gathered in the classroom.

The emphasis, then, is on the *delivery* of the message to be conveyed to others. Alberti and Emmons (1970) have presented seven suggestions for delivery of an effective message using the components of assertive behavior:

Eye contact: Looking directly at another person when you are speaking to him is an effective way of declaring that you are sincere about what you are saying, and that it is directed to him;

Body posture: The "weight" of your messages to others will be increased if you face

the person, stand or sit appropriately close to him, lean toward him, hold your head erect;

Gestures: A message accented with appropriate gestures takes on added emphasis (overenthusiastic gesturing can be a distraction!);

Facial expression: Ever see someone trying to express anger while smiling or laughing? It just doesn't come across. Effective assertions require an expression that agrees with the message;

Voice tone, inflection, volume: A whispered monotone will seldom convince another person that you mean business, while a shouted epithet will bring his defenses into the path of communication. A level, well-modulated conversational statement is convincing without intimidating;

Timing: Spontaneous expression will generally be your goal since hesitation may diminish the effect of an assertion. Judgment is necessary, however, to select an appropriate occasion, such as speaking to your boss in the privacy of his office, rather than in front of a group of his subordinates where he may need to respond defensively;

Content: We save this obvious dimension of assertiveness for last to emphasize that, although what you say is clearly important, it is often less important than most of us generally believe. We encourage a fundamental honesty in interpersonal communication, and spontaneity of expression. In our view, that means saying forcefully, "I'm damn mad about what you just did!" rather than "You're an S.O.B.!" People who have for years hesitated because they "didn't know what to say" have found the practice of saying something, to express their feelings at the time, to be a valuable step toward greater spontaneous assertiveness.

One further word about content. We do encourage you to express your own feelings—and to accept responsibility for them. Note the difference in the above example between "I'm mad" and "You're an S.O.B." It is not necessary to put the other person down (aggressive) in order to express your feeling (assertive).*

Assertiveness training is a vital topic for all teachers. Sources of further information include Fensterheim and Baer's (1975) excellent section involving assertiveness on the job and Gordon's (1974) discussion of teacher communication skills.

Time Management

"If only we didn't have all these regulations from the federal and state governments, we could have time to teach." "The principal is driving me crazy with paperwork and extra duties. I wish I could see my class long enough to teach them!" Anyone who has had the opportunity to teach either may have made similar statements or will have heard others voice such complaints. Interruptions in

* From *Your Perfect Right: A Guide to Assertive Behavior* (Second Edition) (pp. 31–32) by Robert E. Alberti and Michael L. Emmons, 1970. Material revised and expanded in Fourth Edition, 1982. Reproduced for John Langone by permission of Impact Publishers, Inc., P.O. Box 1094, San Luis Obispo, CA 93406. Further reproduction prohibited.

teaching can be frequent occurrences given the many bureaucratic regulations and daily duties of public school personnel. However, teachers should not feel they have no control over the situation. Teachers can control their own time given some basic planning techniques.

There are a number of resources that interested readers can seek out for assistance in time management. Two of the more thorough works are by Lakein (1973) and Applegate (1980), and the following list includes suggestions from both authors. These techniques should be taught to retarded learners and, in fact, in many cases are used to change the behaviors of these students.

1. Teachers should sort out their professional and personal goals by making lists. First, a list of what is to be accomplished during the school year, prioritizing the items from most to least important, is needed. Second, a daily list of what needs to be accomplished, by priority, is a valuable tool when followed.
2. Teachers should analyze the work setting, including both the classroom and the school in general. All schools have activities requiring preset times. Teachers can organize their time around these activities by identifying times for uninterrupted work. Also, when interruptions occur (e.g., assembly) lessons that can be shortened can be planned.
3. Teachers can identify the times of the day that they are most productive (e.g., a.m. or p.m.). Accordingly, they can schedule the most important tasks for their peak times. Also, keeping a schedule fairly constant is important. The routine of performing a task at roughly the same time each day helps cut down on indecision. Once a schedule is set, it is very reinforcing to cross out the activity upon completion.
4. Teachers should build into their schedules frequent, short periods when there is nothing to do. Daydreaming can be an effective reinforcer when controlled. For example, 2 minutes of daydreaming after completion of an activity can be an effective impetus for beginning the next task. When teachers sit down to accomplish an activity, goals requiring a specific period of time or a specific amount of work that must be completed before leaving should be set.
5. Teachers should be assertive and say no. Teachers can't please everyone, so they should be selective of tasks accepted. Some principals, other teachers, and aides are always willing to transfer their burdens onto the shoulders of others. Instead of saying, "I'll do it" or "I'll think about it," teachers can refer the problem back to these people by saying, "What are you going to do?" or "What do you think about it?"
6. Teachers need to delegate authority. Using aides, volunteers, and peer tutors more effectively can accomplish this task.
7. Teachers can battle procrastination through reinforcement. Many teachers use the Premack Principle in reverse; doing something enjoyable first, then working. Unfortunately, this usually results in procrastination. The goal should be to work first and then get a reward. Also, teachers can task analyze the activity into smaller chunks, reinforcing themselves after completion of each component of the task.
8. Teachers should be flexible when unforeseen interruptions occur, for interruptions are inevitable in schools no matter how good the planning. Before returning to a task, teachers can ask themselves if they should move on to a new task and reschedule the interrupted one.



KEY CONCEPTS



- Special educators should be competent in three areas: assessment and diagnosis, curriculum development, and applied behavior analysis.
- Teachers must be able to efficiently manage other instructional personnel such as aides, volunteers, and peer tutors.
- Frequent discussions with other personnel can help solve problems before they occur.
- Teachers should not assign only nonpreferred activities to aides and paraprofessionals.
- Programs can often be improved when the opinions of other personnel are solicited.
- Training manuals developed by teachers can be helpful to other personnel in effectively completing their duties.
- Volunteers make excellent behavioral observers. Videotapes representing different types of student behavior can help train volunteers as observers.
- Parents can be excellent volunteer teachers and observers. These opportunities also give teachers the chance to model preferred teaching strategies with the students of the parent volunteers.
- Service organizations and church groups are excellent sources of volunteers.
- Techniques of assertiveness are vital competencies for teachers. Appropriate body posture, eye contact, and gestures are important considerations when converting others to a point of view.
- Teachers can manage their time more efficiently if they list and prioritize their tasks. Breaking tasks down into smaller components can be an effective technique.

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DESIGNING CURRICULUM OPTIONS FOR MENTALLY RETARDED LEARNERS

■ Curriculum, as a concept, is not easily or precisely defined. For example, debates are carried on over whether curriculum should emphasize the child versus a subject-centered approach, transmission of a culture, or the totality of experiences learners encounter in schools (Tanner & Tanner, 1980). Such issues have generated a number of definitions of what curriculum is (Goldstein, 1981a). Unfortunately, the many definitions of curriculum may confuse the teachers they were designed to help, unless they are seen as valid parts of a dynamic whole.

SELECTIVITY IN CURRICULUM DESIGN

Whatever its definition, a curriculum needs to be flexible enough to meet the needs of a variety of students (Heiss, 1981). All learners, including mentally retarded learners, need exposure to a wide array of curricular options. The key to the differences between curriculum development for general education students and retarded learners is *selectivity*. Skills and objectives chosen for mentally retarded students should reflect their goal of becoming as independent as possible, both in existing and future living environments. Therefore, one definition of curriculum for retarded learners may establish two priority levels in curricular content: what skills are *essential* for retarded individuals to meet some defined level of independence, and what further skills are *desirable* for those individuals to learn, provided they have mastered the essential skills.

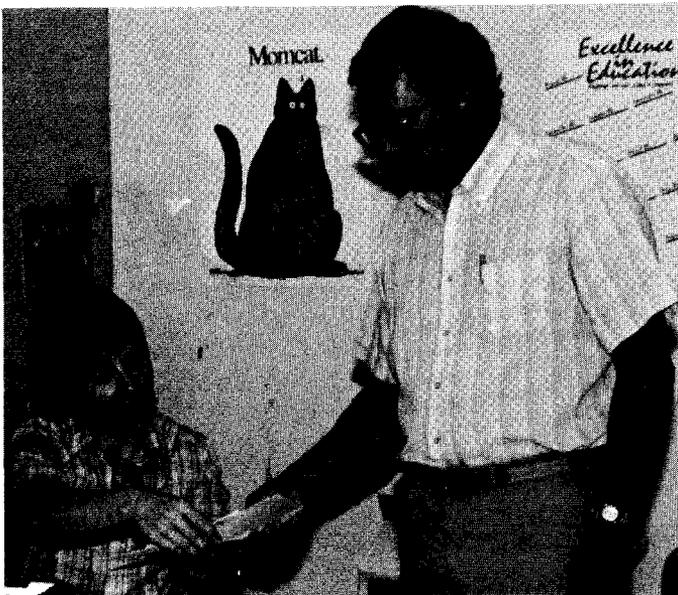
Selectivity involves the careful identification of the skills and objectives that must be met by each retarded individual to reach his or her optimal level of independence. Special educators may be in the best position to identify what those select curricular experiences should include, but unfortunately they are relegated to

a secondary role in the curriculum design process. A curriculum plan may either be adapted from some other source (e.g., commercially produced curriculum guides) or written without input from the teacher. The resulting product of this may be a curriculum that is "content redundant" (Cegelka, 1978, p. 187). Content redundancy results when curriculum guides for one area (e.g., urban New York) closely reflect the content of guides from other areas (e.g., rural Texas).

A major problem arises when teachers try to follow curriculum guides in which they have had little or no input. The goals included in many commercially produced guides may have objectives that are too broad, too general, or inappropriate for teachers to apply to the unique needs of their students.

CURRICULUM DEVELOPMENT AS A DYNAMIC PROCESS

This chapter depicts curriculum somewhat differently. First, curriculum development is viewed as an ongoing, dynamic process, always in a state of planned change. The goal is learner improvement based on individual needs. Second, the process of curriculum design should be adaptable and applicable to many different subjects and situations. For example, when developing curricular options for



Teacher cooperation is necessary to appropriate curriculum development. (Courtesy of Kay Shaw)

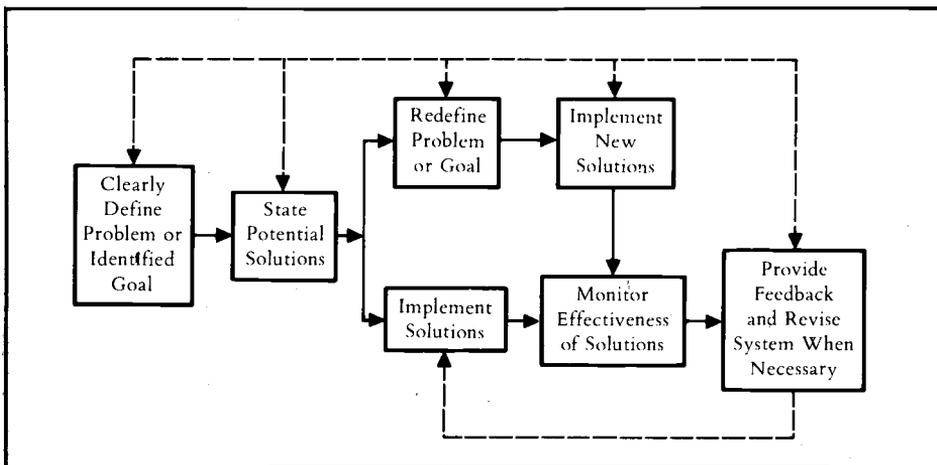
retarded learners, teachers may assist in modifying a middle school science curriculum for the mildly handicapped or develop community mobility options for the moderately and severely handicapped. To match skills to learner needs, the curriculum design process must have a clear-cut sequence of steps that can be applied to a variety of situations.

Finally, the teacher should have a primary role in the design process. At present, some teachers are relegated to a secondary role in identifying appropriate curriculum for students (Budde, 1981). This situation is unfortunate because teachers frequently are the one stable factor in some students' lives. If one goal of special education is to individualize programs for learners, then the person who knows students best as learners and individuals ought to have a primary role in curriculum planning. Accordingly, this chapter focuses on teachers as the coordinators of curriculum design for their students. This does not place the burden of the entire process on teachers, but suggests that teachers be allowed a leadership role in curriculum design with assistance from other professionals as needed.

A Systems Approach to Curriculum Development

Of the three curriculum components that are the basis of this chapter, two require more detailed discussion. A *systems approach* to curriculum views any development project as dynamic and adaptable to many situations (Dick & Carey, 1978; Gagne, 1975). The systems approach involves the application of systematic, clearly designed procedures to a problem or to an identified goal (see Figure 3.1). Some features of this approach set it apart from other techniques.

First, before a problem can be solved or an objective achieved, it must be clearly defined. For example, a group of secondary special educators are concerned



■ FIGURE 3.1
A Systems Approach to Planned Change

that mildly handicapped students trained in their program appear to be unemployed in numbers exceeding the national average. Taken by itself, knowledge of a high unemployment rate among former students probably will not be of much help to the teachers in terms of program development or adjustment. If they were able to define the problem in terms of the following examples, they might have a better understanding of the variables influencing the situation.

1. Many former students appear to have had too narrow a skills training sequence. When they lose a job, they do not have sufficient skills to be easily trained for a new position.
2. Certain former students obtained their first jobs through the work-study coordinator or vocational rehabilitation counselor. After losing a job or when wishing to change jobs, they do not appear to have the necessary job-search skills.

These examples represent only two of the elements that might have been included in the definition of the problem. By beginning with these, the teachers can take an important step toward identifying potential solutions. First, the students seem not to have learned a wide enough array of usable vocational skills, and second, they appear weak in job-search skills.

Once the problem has been pinpointed, the teachers should find it easier to identify possible solutions. One effective method for generating solutions involves a "brainstorming session" in which each teacher expresses his or her ideas. The following are typical solutions that might be generated in such a session by the secondary school teachers.

1. Develop a scheduling system that gives students the option to spend the first four semesters of high school in four different vocational education clusters. The last four semesters might involve intensive training in one or two clusters depending upon observed student interest and aptitude.
2. Work-study or co-op blocks that give students work experience in industry or other community sites might be expanded to include more than one experience.
3. Beginning in the freshman year of high school, students could be given intensive training sessions to teach them effective job-search skills. Information should be appropriate for mildly retarded learners and should be structured to include role playing based on a variety of interview situations. As the secondary program continues, students should be given opportunities to attend interviews in a large number of business and industrial settings.

Once the teachers have discussed these possible solutions, one of two things can happen. The suggested solutions may turn out to be unworkable, requiring a redefinition of the problem or goal. If the problem or goal has been precisely identified, the solutions are more likely to be appropriate, and implementation can occur.

The target problem or goal is then observed under the new conditions, and any changes are monitored. The foundation of the systems approach is the ability to monitor the effectiveness of a set of solutions. A good monitoring system should

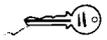
be able to pinpoint ineffectiveness within the overall plan and indicate possible changes as necessary (Goldstein, 1981b).

For example, one specific technique for monitoring the job-search skills program would be to establish criterion behaviors for a student to demonstrate at each field-based interview. Sample criteria might include neatness of dress and appropriateness to the job situation; ability to ask job-related questions regarding specific duties, salary, working conditions, and fringe benefits; and ability to answer questions concerning past employment. These criteria could be rated on a qualitative scale, with both the teacher and the interviewer rating the student independently to compile a reliable measure of the student's skills.

If such an exercise were implemented at selected points throughout the job-search program, teachers should begin to receive information on program effectiveness. Based on this information, the teachers could make decisions concerning program changes, the last component of the systems approach. If the teachers found that most students were consistently scoring low in asking job-related questions, it might indicate a weakness in the instruction (implementation) component. A revision incorporating more oral communication exercises and three-by-five cue cards that students could carry with them might be needed to improve interview performance. This type of revision is important and reflects a basic philosophy of the systems approach: If something does not work for the students, change it. Changes can be made by redefining problems or goals, stating new solutions, or improving components of existing solutions (see Figure 3.1).



KEY CONCEPTS



The systems approach is very useful for solving problems and identifying program goals in a curriculum. There are four main steps in this approach:

- Define clearly what is to be accomplished or what situation currently exists.
- Develop and implement potential solutions based on the definitions.
- Monitor the progress of solutions.
- Revise any component of the system as necessary.

THE IEP AND CURRICULUM DESIGN

Curriculum design is a two-level process. First, a curriculum can be developed for learners based on their assumed needs and a general set of learner characteristics. A class of moderately retarded learners may have annual goals identified for them in areas such as self-care, career and vocational education, language and communication development, and functional academics, among others. This process is used by regular educators to identify curricular options for a group in the content areas (e.g., social studies, science, and commercial and industrial education).

The second level of curriculum design emphasizes individual needs in relation to the group. This is the basis for all special education and is highlighted by the development of the individualized education program (IEP). The IEP is a vital requirement of Public Law 94-142 and includes a number of elements that are best described by the actual text of the law.

[an IEP includes] (A) a statement of the present levels of educational performance of such child, (B) a statement of annual goals, including short term instructional objectives, (C) a statement of the specific educational services to be provided to such children, and the extent to which such children will be able to participate in regular educational programs, (D) the projected date for initiation and anticipated duration of such service, (E) appropriate objective criteria and evaluation procedures and schedules for determining, on at least an annual basis whether instructional objectives are being achieved. (P. L. 94-142)



The second level of curriculum design emphasizes individual needs in relation to the general group—the basis for all special education and the individualized education program (IEP). (Courtesy of Gwinnett County Public Schools, Georgia)

Basically, these points relate to five components of curriculum design: (1) assessment of learner needs; (2) development of curricular components to meet those needs; (3) identification of support systems and instructional settings to meet student needs; (4) implementation of program management and time-line components; and (5) development of a program monitoring system. The IEP may be viewed as a management system that assists teachers in providing the most effective and efficient instruction for individual students (Price & Goodman, 1980).

Components of the IEP

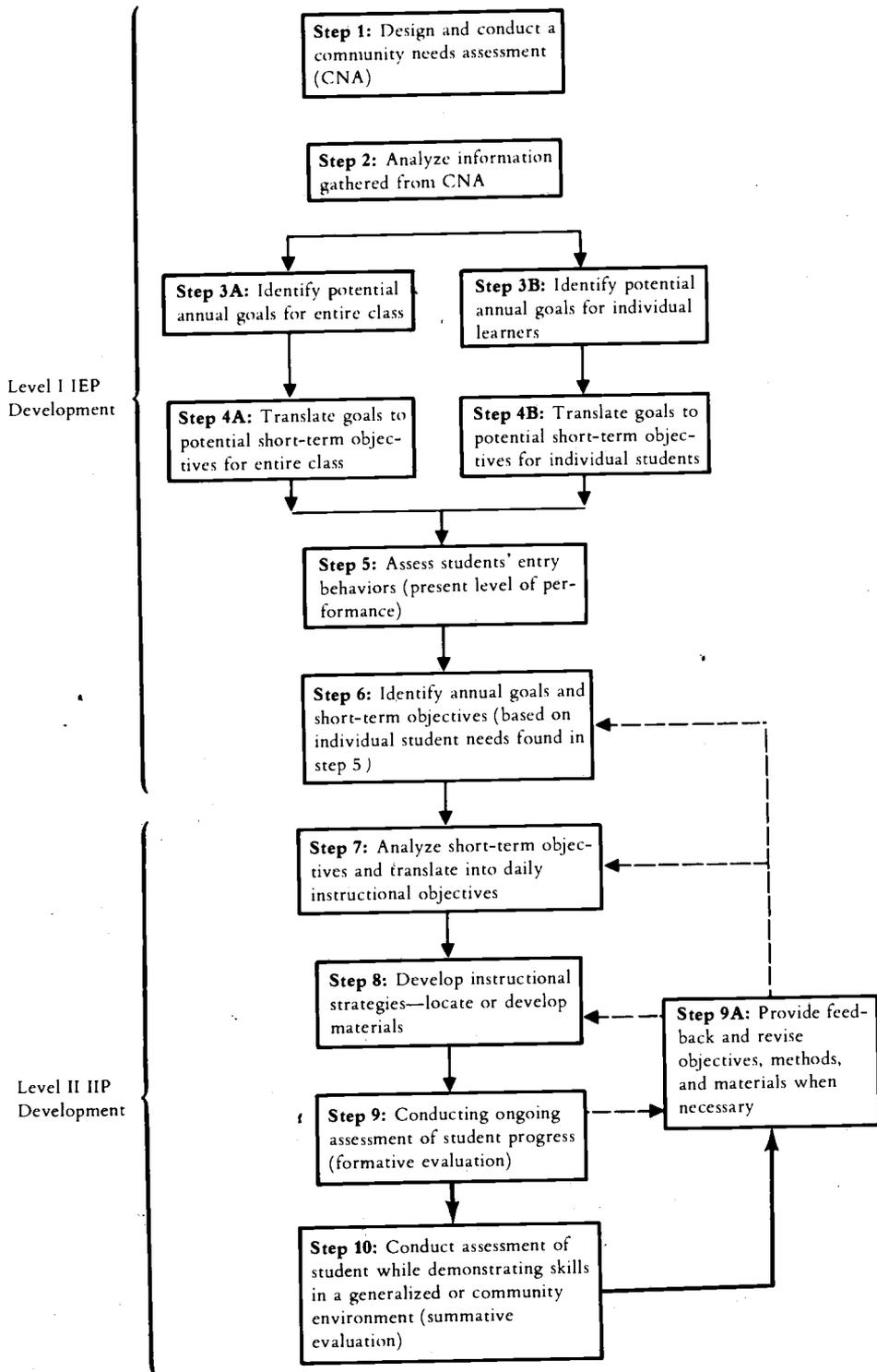
[The entire system is based on assessment. A profile that gives a clear picture of the learner's current level of performance is developed (Turnbull, Strickland, & Brantley, 1982). Standardized tests, criterion-referenced measures, and behavioral observations can be used to assess student behavior in curricular areas such as academic and social skills. Assessment of a student's strengths and weaknesses is the basis for both instructional design and the IEP.] For example, a social goal for a profoundly retarded person may be to establish eye contact with a therapist when he or she says, "Look at me." This goal can be assessed initially by recording the number of defined eye contacts occurring within a given time. Once this has been established, a program to increase the target behavior can be developed.

Similarly, a mildly retarded student's current computation skills may be assessed by using the Key Math Diagnostic Test (Connally, Nachtman, & Pritchett, 1971). [Both on the IEP and in systematically developed instruction, sampling the learner's entry behavior is vital. The difference between the systems is simply the degree to which assessment is implemented. The IEP assessment level is broad and describes a student's general level of performance, while the process of instructional design continues and the assessment becomes more specific.] (See Figure 3.2.)

[The second component of the IEP deals with curricular options stated as annual goals and short-term instructional objectives. Objectives based on the initial assessment are written in performance terms and designate the broad curricular goals and subsequent objectives that are important to the student. There is an important relationship between this component of the IEP and instructional design.] To best understand this relationship, the IEP should be viewed as the document identifying the components of the general curriculum best fitting a learner's needs. Principles of instructional design are then applied to those areas outlined in the IEP to implement the plan for daily teaching.

[The third component of the IEP identifies support services needed by the learner to successfully participate in the selected program options. For example, a severely retarded student who is also physically disabled may require the services of a physical therapist to ensure maximum participation in a public school program.] Similarly, a mildly or moderately retarded learner may benefit from a counselor to assist in adjusting to nonhandicapped peers.

The connection between the IEP and instructional design is a simple one.



■ **FIGURE 3.2**
A Systems Approach to Designing Special Education Curricula

Students should have the necessary methods, materials, and services they need to succeed. The ultimate goal in both systems is essentially the same: to increase the probability of student progress.)

The fourth major area of the IEP is program management. Here, availability of regular education programs in which the student can participate is indicated. Also, the anticipated duration of the program is stated to assist in overall time management and to suggest schedules for goal reevaluation.) The systems approach to instructional design relies on organization to ensure a smooth transition between program components.

The final component of the IEP deals with program evaluation and accountability and outlines procedures for ongoing assessment of student behavior. Frequent samples of learner performance, usually in the form of criterion-referenced tests and behavioral observations, are used to measure the program's effectiveness in bringing about the desired change (Bepko, 1981). If the program is not working, the analysis should result in the necessary modifications.)

The elements of the IEP not only relate to, but actually were developed from the tenets of systems analysis. Each area of the IEP is based on empirically validated components from a number of systems models. For example, Glaser (1962) developed a model consisting of (1) designing instructional objectives; (2) determining student entry behavior; (3) developing instructional procedures; and (4) implementing performance assessment. These four units resemble the components of many systems analysis and instructional design models. The usefulness of a systems approach to designing curriculum is that the model can translate the IEP management plan into objectives and activities used by teachers.

When the systems approach is used, the IEP is not the end of program design. Rather, the development of this plan is only the beginning, the framework. The principles of instructional design are then further applied to develop a more detailed implementation plan. This plan has many labels, such as individual implementation program (IIP), portfolio, student profile, and unit of instruction. Whatever the label, the construction of an IIP requires more detailed use of instructional design. In perspective, the IEP is a plan based on the identified needs of individual students that establishes broad curricular goals and program objectives. The IIP for a target student specifically states day-to-day objectives and intervention techniques to be used.

DEVELOPING EFFECTIVE IEPs

Developing an IEP that is an effective management plan is not a difficult task. Unfortunately, the bureaucracy of public schools may put pressure on teachers to use "shortcuts" when developing programs (Nadler & Shore, 1980). A number of mistakes may occur if IEP development is looked upon as an arduous task. Table 3.1 presents some possible errors that can be made and alternative steps that may be more appropriate.

TABLE 3.1 Potential Mistakes and Solutions When Developing IEPs

Undesirable Practices	Preferred Practices
1. Evaluation information used to establish present level of performance is based only on survey level norm-referenced instruments. For example, in order to expedite the IEP development process only a Wide Range Achievement Test is administered to establish academic deficits. This test provides only a rough grade level score over certain academic areas.	1. A thorough assessment process is applied including specific level tests in each academic area. These tests might include norm-referenced and such criterion-referenced measures as the Brigance Test—where portions pertaining to a given student are administered to obtain a complete picture of, for example, a learner's ability to add and subtract.
2. Present level of student performance is represented by only grade level scores, e.g., Math 2.6 Reading Recognition 2.2 Spelling 2.3	2. Present level of student performance is represented by a <i>thorough</i> list of student strengths and weaknesses identified by the above assessment process (refer to Table 3.8).
3. Annual goals and short-term objectives are taken from a list provided by the school system. Essentially all mentally retarded learners in a class have objectives from that list based on what is being taught in their class at a given time.	3. Annual goals and short-term objectives are tailored for a specific student based on results from an in-depth assessment process. Using this method, students within the same group may have somewhat different objectives based on their needs.
4. Short-term objectives are written in terms that are not measurable, e.g., Understand division. Improve communication skills. Improve mealtime behaviors.	4. Short-term objectives are written in terms that are measurable, e.g., Correctly compute 10 division problems. Orally request free time. Make 10 new manual signs. Use a spoon to place food in mouth.
5. Evaluation procedures consist of retesting student at end of year with a norm-referenced measure, e.g., Fall, 1983—PIAT Math 3.2 Spring, 1984—PIAT Math 3.3	5. Ongoing evaluation procedures involve the weekly or daily criterion-referenced (teacher-made) tests relating to each objective. When this approach is used, if learning is not occurring a change can be made relatively quickly.
6. Educational services, such as time spent in regular classes, are based on existing class sizes and which courses are easiest for retarded students to take. Also, once staffed into a regular class, the student has to follow the same curriculum as everyone else.	6. Designating what regular classes are best for a given learner is based on course content and its appropriateness to the student's life. In such cases students might only be staffed into some classes for specific modules when the subjects were deemed appropriate. Where students are placed in classes on a full-time basis, it is done because they are to benefit, not because of an opening in the schedule.

(Continued)

TABLE 3.1 (Continued)

<i>Undesirable Practices</i>	<i>Preferred Practices</i>
7. One afternoon a week is designated as "IEP day," and schedules of 10-minute sessions are used to develop the document.	7. IEP sessions are scheduled at the convenience of all participants, and ample time is allotted to develop an effective document. Preparation for the IEP can begin before the actual meeting by assigning different tasks to different people. For example, a pool of objectives based on a community needs assessment can be developed from which the committee can choose the ones that are most appropriate.
8. For expediency purposes, IEP meetings are called at a time when concerned professionals cannot attend, or they are attended by others instead of the teachers who will be in charge of the child (e.g., vocational supervisor attends instead of the agriculture teacher in whose class the learner will be enrolled.)	8. The specialists whose impact may be crucial to a given student's IEP (e.g., physical therapist, vocational educator, special educator, or regular educator) take an active part in the development process. For example, if a student is being considered for placement in a vocational education program, the vocational educator assists in developing work samples that can be used to determine the student's present level of vocational performance. These results are used by the vocational educator to develop a pool of objectives for the IEP committee's consideration.
9. Parents are invited to the meeting and presented with standardized test scores and educational jargon in an effort to convince them that professionals know what is best for their children.	9. A volunteer (possibly the teacher who will be working closest with the parents) becomes the family's and student's advocate. This individual meets with the parents prior to the IEP meeting, explaining the assessment results (in terms of strengths and weaknesses, not test scores). Also, the advocate attempts to assist the parents and whenever possible the student to set their goals and express their interests in what they feel is important.

APPLYING THE PRINCIPLES OF INSTRUCTIONAL DESIGN: IDENTIFYING ANNUAL GOALS

Teachers generally can choose broad program goals before learners enter the classroom. An appropriate curriculum for mentally handicapped learners includes

goals that emphasize teaching these individuals to live in less restrictive environments (Frank, 1983; Siders & Whorton, 1982). The most appropriate goal areas for some severely retarded students may be self-feeding, dressing, communication skills, and participation in leisure activities. Many mildly retarded persons may profit from the application of complex academic skills (e.g., math word problems, word analysis).

Arithmetic can serve as an example for this process of program goal identification. Arithmetic goals are found in most curricula for retarded learners (e.g., functional use of the hand calculator for shopping, measurement in a vocational setting, or counting change to buy a soda). Within the broad program area of arithmetic there are a number of subunits or cluster goals (Schwartz & Oseroff, 1975) such as the basic operations (e.g., addition, subtraction), time, money management, and fractions.

Self-care skills are a second example of a program area. A number of cluster goals can immediately be identified, including dressing, eating, toileting, and grooming.

Basic skill areas (reading, arithmetic, writing, self-care) are identified before the student arrives, providing the teacher with an organizational reference for assessment. Teaching the mentally retarded requires teachers to go beyond what are considered traditional basic skills and develop programs to teach community mobility, career education, and prevocational/vocational components. The instructional design process begins with establishing this framework for identifying annual goals. It then becomes more specific, with annual goals analyzed into subtasks (Tymitz-Wolf, 1982). At this stage the instruction is individualized by comparing the learner's present performance against these subtasks. This component allows teachers to make decisions about the skills most important for a student's needs (See Figure 3.2).

Relying only on what teachers *think* students need, however, may result in a narrow view of curriculum (Morgan, 1981). For example, teaching functional arithmetic in some schools may translate into computing addition and subtraction problems on worksheets. The alternative is to apply the principle of *community validity*, establishing whether curricular content is useful to students. Community validity is a principle that allows teachers to judge the usefulness of certain skills to the lives of mentally retarded learners. If skills are not deemed to be community-valid, they are not given a high priority for instruction. Therefore, for some learners, computing addition or subtraction problems on a worksheet may not be considered a community-valid set of skills. On the other hand, teaching those same skills in the context of making purchases in a grocery store may translate the skills into more valid outcomes.

Community Needs Assessment

The method of deciding the validity of potential annual goals or identifying previously unidentified goals is to conduct a *community needs assessment* (CNA). This first step in the curriculum development process (see Figure 3.2) allows



“Student will independently ride the bus from point A to point B” is an outcome component of a measurable objective. Behavioral objectives also include context and criteria components. (Courtesy of Kay Shaw)

teachers and other concerned professionals the opportunity to be more aware of what skills are needed in the home and in other community sites. The information from a CNA assists teachers in identifying actual student needs and establishing priorities for teaching based on those needs. For example, a teacher of moderately and severely retarded students between the ages of 18 and 21 years might visit potential community living options targeted for these students. In any given community, there may be many options ranging from home placement to independent living centers to no community based group homes.

Each available living option will differ in its features that learners must adapt to, for example, availability of mass transit, relationship to leisure/recreation activities, types of cooking facilities, amount of supervision, and physical layout of the living quarters. These and other environmental features will dictate different annual goals and short-term objectives, which teachers can address while the students are still in school (see Table 3.2).

TABLE 3.2 *Sample Questions for Community Interviews*

<i>Parents' Interview (Current Students)</i>
<i>Sample Questions</i>
<ol style="list-style-type: none"> 1. What jobs or self-care tasks would you like your son or daughter to be able to perform independently at home? 2. Are there any academic skills that, if your son or daughter could do them, would be directly usable at home or in the neighborhood? 3. Do you live near any mass transit? If so, what type?
<i>Former Student Interview*</i>
<ol style="list-style-type: none"> 1. What training did you receive in school that does not help you in your current job or life in the community? 2. What skills did you have to learn in order to live on your own? 3. Are there any jobs that you would rather do? Why have you not tried to get these jobs? 4. What problems do you have where you live, where you work, or in your places of recreation?

*In the case of moderately or severely retarded individuals, the same information can be gained by directly observing them in their current placement.

Sources of CNA Data

The CNA can be a formal project resulting in a published research study or a series of informal observations resulting in information for use by teachers. There are many sources where this information can be obtained. The most important sources are those most affected by the program (e.g., parents, guardians, and current students) (Soffer, 1982). As dictated by P.L. 94-142, these individuals should be allowed to participate in the program planning process and provide input into the identification of appropriate goals and objectives (Goldstein, Strickland, Turnbull, & Curry 1980).

Meeting the parents at the IEP meeting and discussing potential curriculum options may not provide the best information. If possible (especially in the case of severely retarded students), teachers should consider working with parents by conducting a needs assessment of skills required at home. A teacher may teach a student to cook on an electric stove at school, only to find out that there is a gas or wood-burning stove at home. Similarly, teaching a student to take a shower if there is only a bathtub at home serves to narrow the scope of the curriculum. Including parents and learners in the community needs assessment provides a wealth of knowledge about the need for specific skills in the natural environment.

There are many other sources of information as well. Graduates of the program and their parents, as well as nongraduates or dropouts, can often provide insight into how well the curriculum is training students to live and work in the

community. Employers in business and industry can also provide useful information concerning types of job skills required, trends in employment, current openings, and the possibility of establishing community work sites. This information regarding job requirements can be helpful when establishing objectives for a secondary curriculum. In addition, information concerning the types of jobs available may be of help to elementary teachers who are developing career awareness components in their curricula.

There are other people in the community who can be useful to teachers. For example, neighbors of group homes can often provide insight into what makes retarded adults "good neighbors" and accepted members of a neighborhood. Community agencies, state departments, and university faculty can all provide data useful in establishing the scope of curriculum.

One immediate source of information is teachers from different disciplines who can identify skills retarded learners will find helpful in mainstreamed environments. In any case, before special educators can consider developing curricular options, a community needs assessment should be implemented to identify the skills learners need to be as independent as possible in current or future environments.

Gathering CNA Data

Methods for gathering community assessment data include questionnaires, interviews, public meetings, and direct observation. Questionnaires can often reach large numbers of people, providing a large amount of information to those who conduct the survey. However, because it may be difficult to get a significant return, this method may not be practical for teachers. The questionnaire method might be used to better advantage by district-wide curriculum committees.

Interviews will be an important part of any community needs assessment effort. Gathering information from parents, students (both present and those no longer involved in the program), employers, and neighbors are examples of how the interview method can be used. An interview with any community member will be more productive if the teacher plans for it in advance. This advance planning usually involves listing several questions that are pertinent to the person's occupation (e.g., questions to parents will be different from questions to employers) and designing a form so that the data collected can be kept for analysis and future use. Table 3.2. provides two examples of sample questions that may be asked of former students and parents of current students. In each instance the goal of the interview will be to ascertain how well these people are integrating into the community, what skills would be helpful for them to be better integrated, and what skills were taught to them that had very little impact on their lives.

Public meetings can be another form of interview technique. Teachers can attend these meetings and discuss with participants their ideas about appropriate curricular options for retarded learners. For example, teachers may attend local or state Association for Retarded Citizens (ARC) meetings. By request, they may be included on the agenda, presenting the group with questions similar to those in Table 3.2.

Other meetings where teachers can gather useful information are advisory board and service group meetings that are held periodically around the community. Vocational educators are mandated by law to develop advisory boards in their service areas. A special educator who has established a working relationship with a vocational educator may be able to attend an advisory board meeting and discuss topics such as the skills needed for retarded students to enter the workforce.

The final, and often most useful, technique for gathering CNA information is direct observation. This technique involves venturing into the community, observing specific skills demonstrated by community members, and recording those skills in the sequence in which they occur. Gathering information in this manner should not be overlooked or underrated. A teacher of secondary learners may, for example, record the duties and skills required of a person who works in a hospital. This recorded information can be translated into objectives and included in the curriculum. Similarly, by riding a city bus and recording the steps required to do so (e.g., communication skills—asking the driver about stops; academic skills—counting out the correct change), teachers can better identify the skills a retarded learner would need to be more mobile. Once identified, these skills can become part of the general curricular area of community mobility.

There are an endless number of community-based environments that teachers and others can observe and analyze. Table 3.3 provides some of the more important of these. As information is gathered about relevant community environments, a more detailed analysis of each situation will produce a list of specific skills for each area for inclusion in the curriculum (see Table 3.4).

TABLE 3.3 *Analyzing Community-Based Environments: Direct Observation*

<i>Environment</i>	<i>Skill Areas</i>
1. Grocery stores	1. Academic skills { Reading Math Communication skills Mobility skills
2. Bowling alleys Video-game arcades	2. Academic skills { Reading Math Communication skills Mobility skills Leisure/recreation skills
3. Home	3. Self-care skills Home management skills Mobility skills Home maintenance skills
4. Restaurants	4. Potential employment outcomes Self-care skills Communication skills Academic skills Eating skills

TABLE 3.4 *Analyzing Community-Based Environments: Direct Observation*

<i>Community Environment</i>	<i>Location of Task Completion</i>	<i>Tasks or Skills</i>
1. Grocery stores	Deli	Request two types of cold cuts Use a calculator to figure cost Read names of cold cuts
	Checkout line	Communicate with cashier Place items on counter Pay for items Check returned change
2. Bowling alley	Cashier counter	Ask fees Rent shoes Pick up score sheet
	Bowling ball rack	Choose appropriate size and weight
	Alley	Find correct alley Play game Keep score
3. Home	Kitchen	Wash dishes Make simple meals Clean kitchen
	Bathroom	Practice appropriate grooming and toileting skills
4. Restaurant (fast food)	Counter	Read menu Estimate cost Order; communicate with cashier Pay
	Seating area	Choose seat Eat Clean area



IDEA FILE



Most teachers do not have unlimited time to venture into the community and implement a needs assessment. However, there are a number of other ways to gather a good deal of valuable information:

- Use volunteers. High school students, college students (if available), community service groups, and parents are all potential sources of assistance.
- Spend a little time training the volunteers. For example, a high school student whose task is to observe and record the job skills of a hospital orderly will need to know

what skills to look for, such as number of communication efforts the orderly engages in, types of verbal directions the orderly must understand, and academic skills needed to perform the task (e.g., reading labels on boxes).

- Identify one or two environments to observe per week (this number can change depending on the availability of volunteers).
- Organize information as it is gathered in a series of file folders. For example, if a grocery store is being analyzed, (e.g., adding, subtracting, money management), adaptations for academic skill deficits (e.g., use of calculator), communication skills (e.g., asking where items are located). This information is easily retrieved for later IEP development if it is organized in a systematic fashion.
- Use the telephone as a quick and efficient method for gathering some types of information.

Analysis of CNA Data

Identifying annual goals for a student's IEP is one result of the information gathered during the community needs assessment (CNA). A strict definition of community may be understood to include everything outside the school. The learner's school experience, however, is a large part of his or her life. Therefore, the concept of community should also be applied to school activities. For example, a mildly retarded learner who is to be mainstreamed into a science class may be at a disadvantage if someone has not analyzed the situation beforehand. In this instance, the needs assessment may involve having the regular and special educators decide which of the units in the science curriculum would most benefit the learner.

Similar examples of moderately retarded students entering a vocational education class or severely retarded students eating in the school lunchroom highlight the need for an in-school needs assessment. In the first case, the moderately retarded learner may need a number of adaptations to be successful that, if identified, can be programmed into the curriculum by both teachers. The severely retarded student eating in the lunchroom may require a different set of skills than those needed to eat in an isolated classroom (e.g., choosing among a variety of foods). The teacher who analyzes the lunchroom environment should be alert to these differences and account for them in the teaching sequence.



KEY CONCEPTS



- Annual goals for IEPs are a direct result of a needs assessment conducted for community and school environments.
- By knowing what retarded learners must be able to do at home, on the job, in leisure/recreation situations, and so forth, teachers are in a better position to separate curricular goals and objectives into *need-to-know* and *nice-to-know* categories, teaching the need-to-know objectives first.

- Deciding which annual goals are a “best match” for individual student needs is not an easy process. However, there are some techniques and criteria that can help teachers make good decisions.
 - Interview parents and the students themselves, asking for their opinions.
 - Consider the age of the students and how many years they have left in school (e.g., for an 18-year-old student community mobility may be a high priority).
 - Decide whether the skill is a necessary prerequisite for other skills (e.g., addition and subtraction skills are required before it is possible to learn division).
 - Identify any adaptations that may assist students in moving on to more advanced skills (e.g., a moderately retarded student who has not mastered the basic operations may be able to use a calculator to comparison shop).
 - Questionnaires, interviews, public meetings, and direct observation are all useful methods for gathering needs assessment data for curriculum development.
-

PRINCIPLES OF INSTRUCTIONAL DESIGN: IDENTIFYING SHORT-TERM OBJECTIVES

Short-term objectives on the IEP are an important concern in two steps of the instructional design process (see steps 4a, 4b, and 6 in Figure 3.2). First, a group of potential short-term objectives identified during the CNA can be used as a guide by which students can be assessed. For example, the analysis of one CNA may identify an annual goal of improving community mobility using public transportation (bus riding). A breakdown of the skills required to meet this goal generates a number of potential short-term objectives. The teacher now has a guide to assess a student's present level of performance in riding a bus. This step is important. Without a bank of community valid short-term objectives to use as a guide, the temptation may be to judge the student's performance against academic skills and isolated self-help skills as evaluated by adaptive behavior scales.

The second step in identifying short-term objectives (step 6, Figure 3.2) is to choose those that meet the needs of the individual retarded learner. In this step a group of professionals establishes a student's present level of performance against many potential short-term objectives (see Table 3.5). For a given retarded learner there can be a large number of areas that require attention (each area having a large number of potential short-term objectives); however, it would not be possible to cover all the identified student needs in one school year. Therefore, in step 6 of the process the IEP committee picks those short-term objectives that the learner most needs to accomplish.

Before discussing how the most important short-term objectives are chosen for students, the process of translating annual goals to short-term objectives should be discussed. *Translating* refers to breaking down large units of instruction into smaller, more manageable tasks, a process that has been termed *task analysis*.

TABLE 3.5 Examples of the Many Areas That Can Be Assessed Prior to the IEP Development

Professional	Potential Areas Assessed
1. Classroom teacher	1. Specific level academic skills (e.g., decoding vowels, reading comprehension: sequence). Dressing skills (e.g., at school, with parent at home). Street crossing skills (e.g., three community intersections).
2. School psychologist	2. Performance on personality tests. Psycholinguistic skills.
3. Vocational educator	3. Work samples in agricultural education.
4. Physical therapist	4. Performance with adaptive equipment. Range of motion.
5. Speech therapist	5. Articulation of sounds. Use or need of alternate communication systems.

Task Analysis

The process of instructional or task analysis may not be as simple as some professionals believe. Teachers are finding that to develop a meaningful analysis they need such resources as knowledge of the content area, ample time, and brainstorming sessions with their peers. Teachers of the retarded are also finding that although many task analyses are commercially available in the areas of academic and self-help skills, there is still a need for analyzing task-specific skills that arise in prevocational cluster areas.

In beginning the process of analysis teachers ask one important question: Do I have the expertise to design a program in the subject area in question? No one is an expert in all content areas. In instances when unfamiliar subject matter is involved, specialists should be consulted. A special education teacher, for example, may not be familiar with the intricacies of teaching in the cluster area *decoding* under the program goal of *reading*. The teacher could consult with a reading specialist concerning an appropriate task analysis for this area. By the same token, other teachers may not be familiar with the latest toilet training techniques or proper physical positioning in a classroom for retarded learners with severe physical impairments. In either case, consultation with appropriate professionals must occur before an effective task analysis can be accomplished.

The technique of instructional or task analysis is used to translate annual goals into short-term objectives (IEP) and later to translate the short-term objectives into daily instructional objectives (IIP or lesson plans). Dick and Carey (1978), Gagne and Briggs (1974), and Gagne (1977) have differentiated between two major forms of instructional analysis that can be useful for teachers: the procedural approach

and the hierarchical approach. The procedural approach is used when individual behaviors are taught consecutively to reach a specific objective. The series of behaviors included in a procedural analysis are independent of each other and often can be interchanged. One example of this approach is home dishwashing skills. Some teachers may require a student to wash all the dishes before rinsing, while other teachers may require their learners to wash each dish and then rinse it before moving on to the next step. Each step is independent, and in some cases they can be interchanged depending on teacher decision or student needs (Table 3.6).

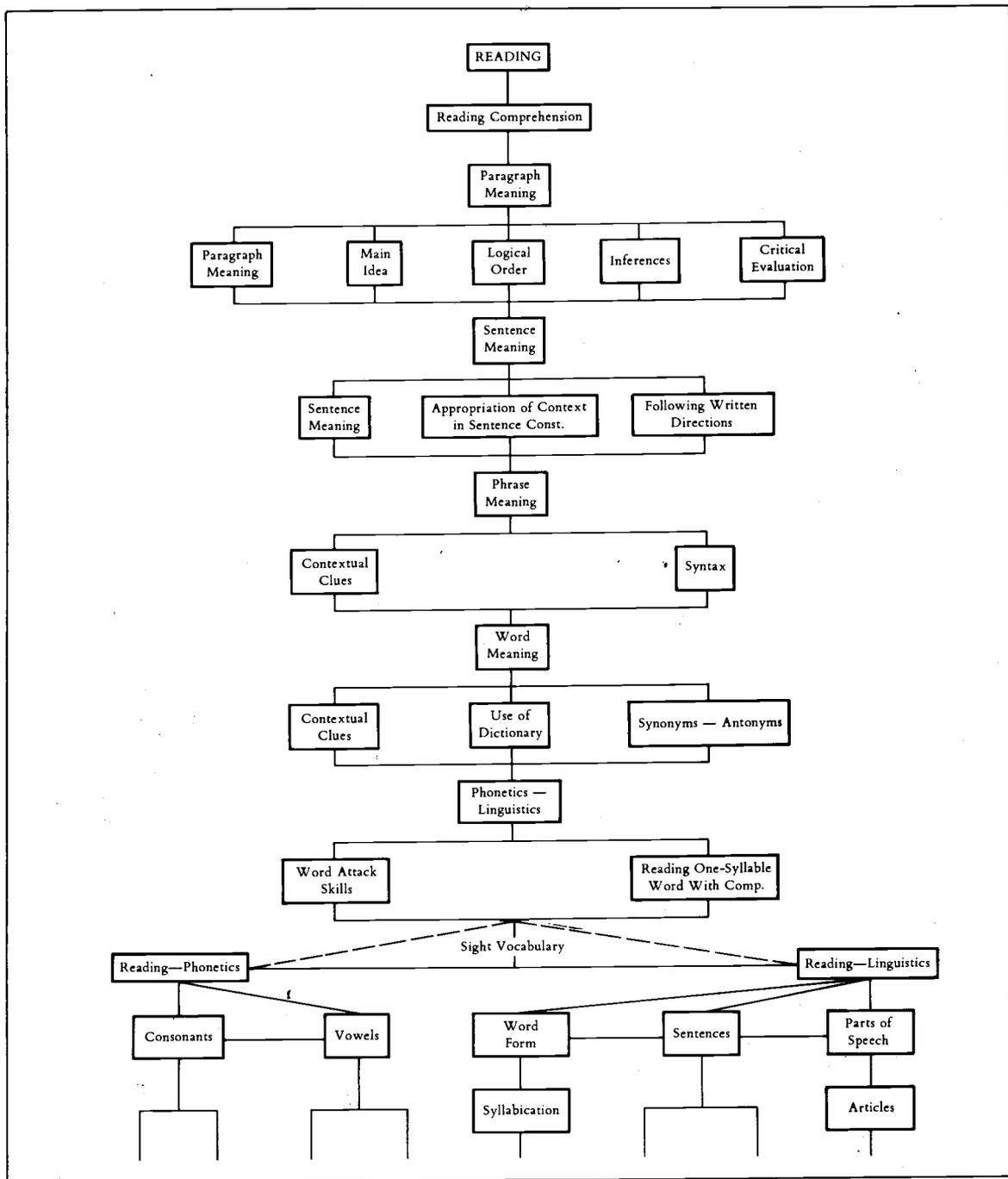
The hierarchical approach involves identifying prerequisite skills and placing them in a hierarchical order leading to the desired objective. Academic skills generally lend themselves to this approach, each skill in the sequence being somewhat dependent upon the previous skill. The instructional analyses of reading and arithmetic shown in Figures 3.3 and 3.4 were developed by Schwartz and Oseroff (1975) and provide a good example of hierarchical analyses.

Finally, a logical extension of the two approaches is a combination of both. The combination approach, as described by Dick and Carey (1977), is useful when dealing with behaviors requiring a complex set of both psychomotor and cognitive skills. For example, an approach to teaching a community mobility skill such as riding the bus might look like the one shown in Figure 3.5.

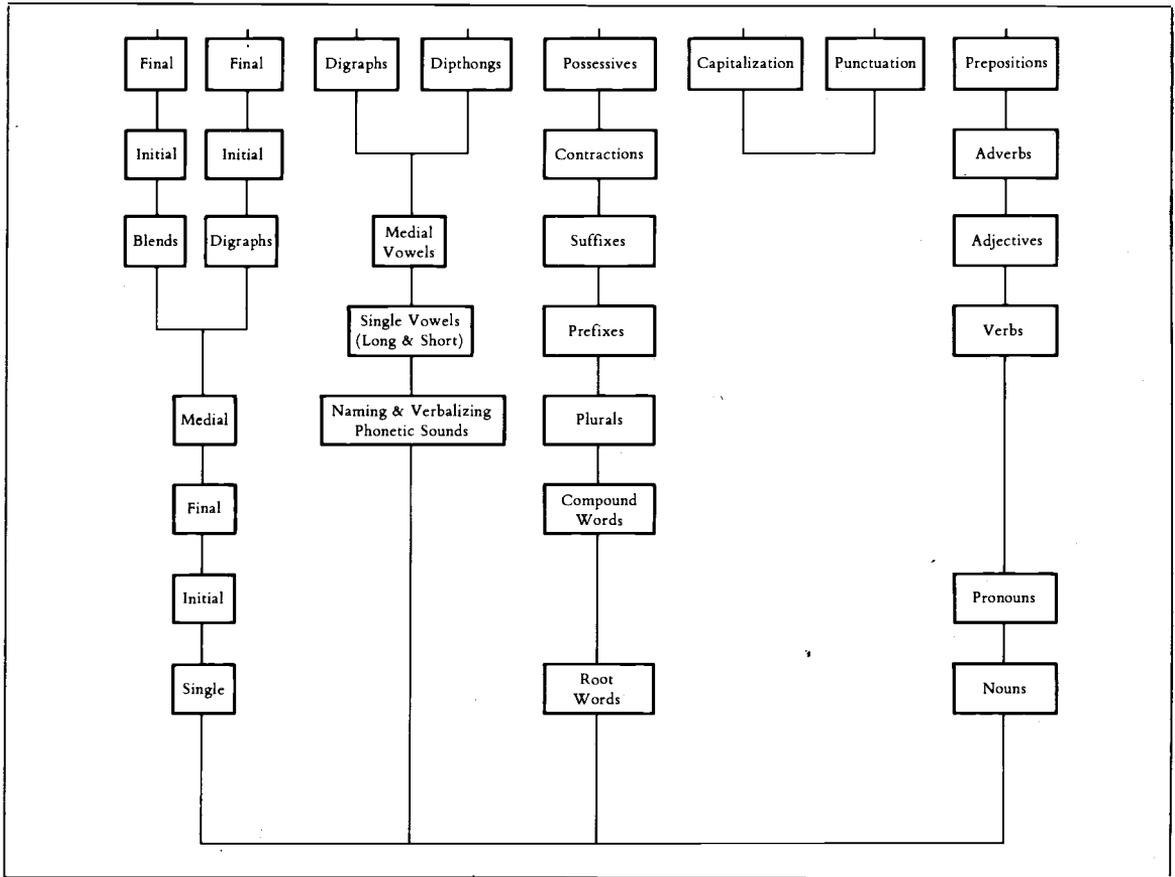
The task sequencing approach a teacher uses depends upon the behaviors that are to be taught. A number of resources exist for teachers to gain assistance in developing a workable analysis. For example, appropriate instructional analyses for academic skills can be found in the scope and sequence charts in teachers' manuals and college textbooks. Also, commercially available task analyses for independent living skills are plentiful (e.g., the MORE System, Keilitz, Horner, & Brown, 1975).

TABLE 3.6 *Examples of Task Sequences for Washing Dishes*

<i>Skill Sequence</i>	<i>Skill Sequence</i>
1. Place plug in drain.	1. Place plug in drain.
2. Place dishsoap in sink.	2. Place dishsoap in sink.
3. Turn on hot water (adjust temperature).	3. Turn on hot water (adjust temperature).
4. Place dishes in sink.	4. Place dishes in sink.
5. Wash all dishes and place in second sink.	5. Wash each dish and rinse, placing dish in drainer.
6. Rinse each dish and place in drainer.	6. Drain water from sink.
7. Drain water from sink.	7. Rinse sink.
8. Rinse sink.	8. Dry counter.
9. Dry counter.	



■ **FIGURE 3.3**
Sample Hierarchical Task Analysis of Reading (From The Clinical Teacher for Special Education by L. Schwartz and A. Oseroff, 1975. Tallahassee: Florida State University.)



■ FIGURE 3.3 (Continued)

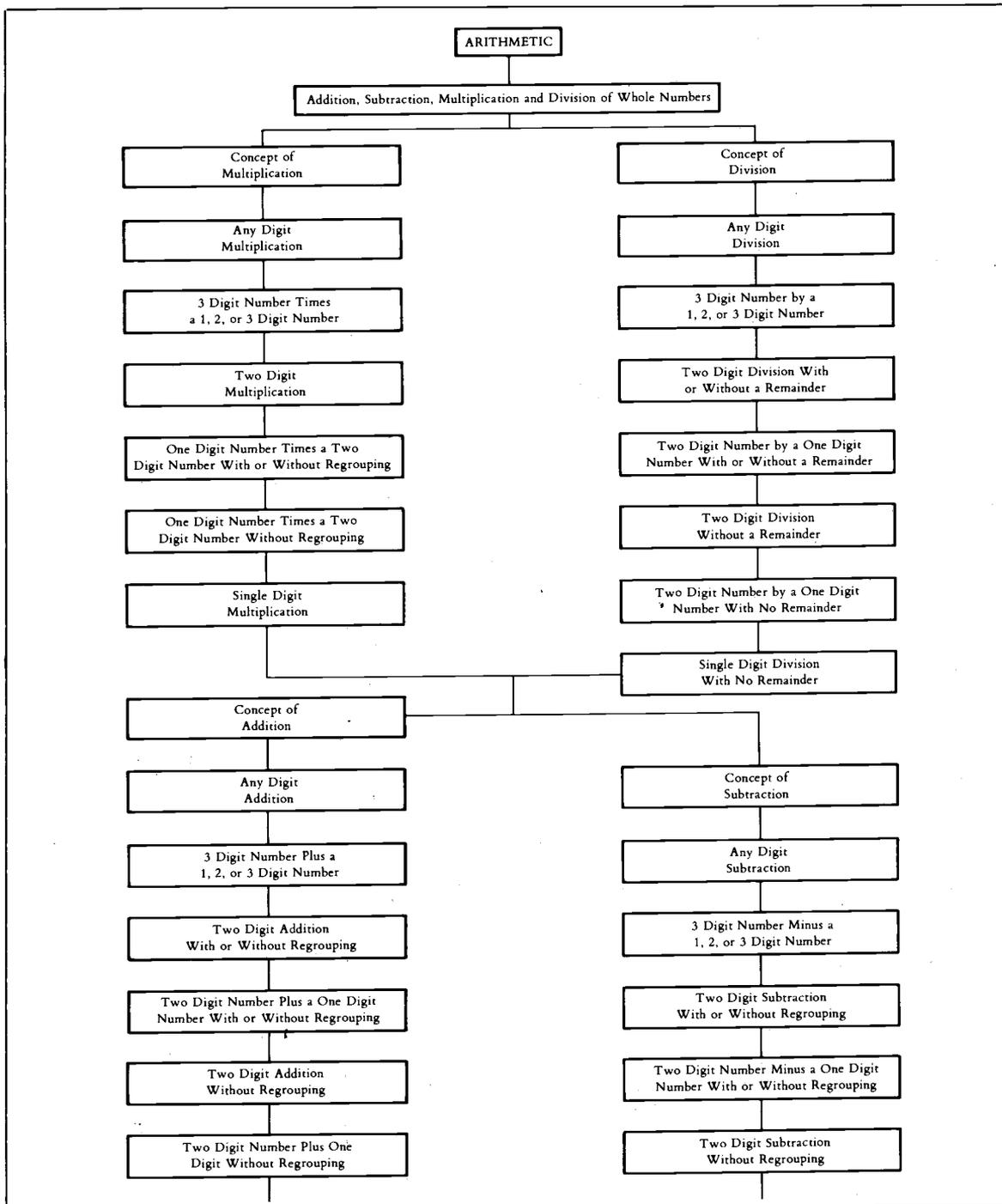
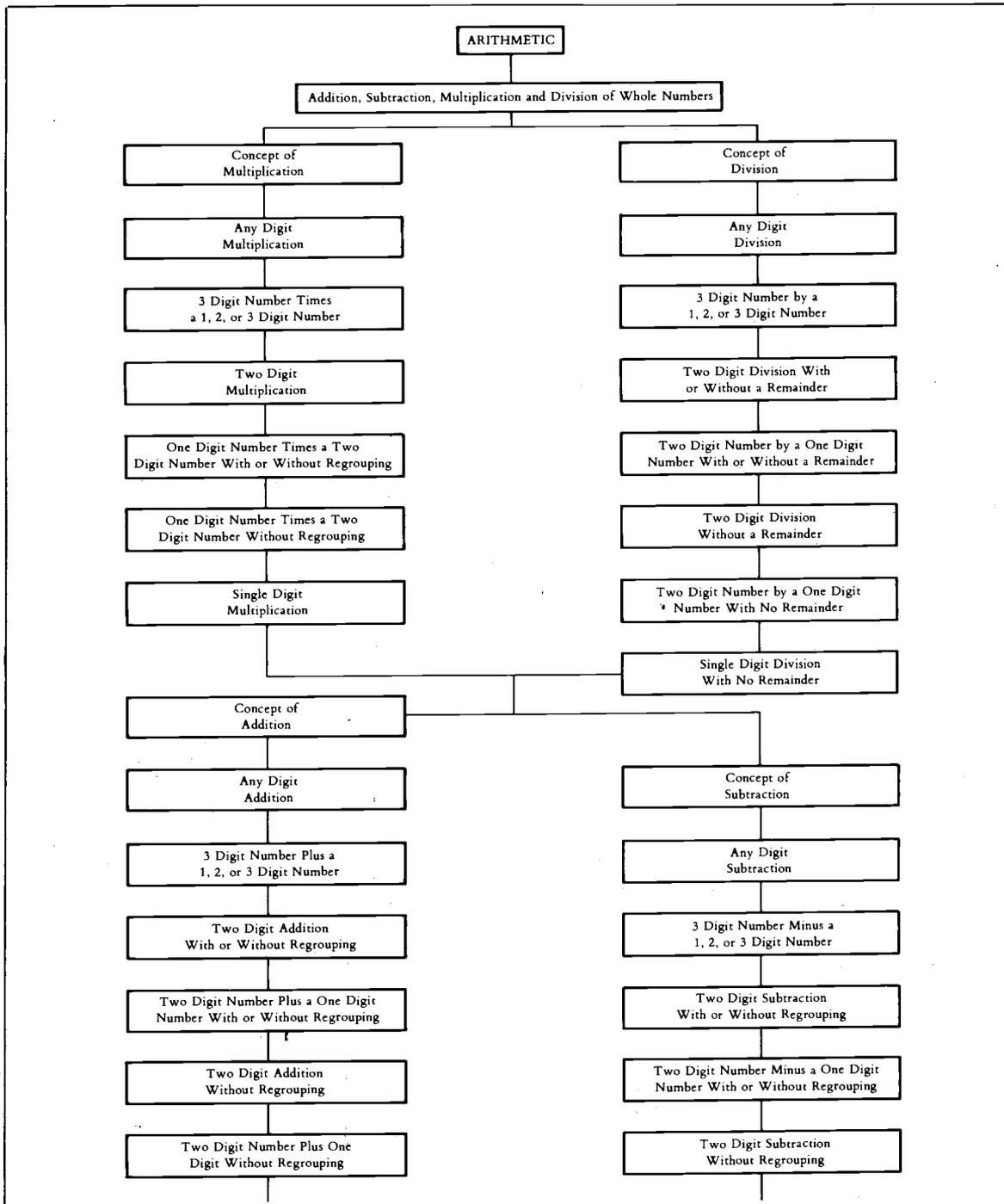


FIGURE 3.4

Sample Hierarchical Task Analysis on Arithmetic (From *The Clinical Teacher for Special Education* by L. Schwartz and A. Oseroff, 1975. Tallahassee: Florida State University.)



■ FIGURE 3.4
 Sample Hierarchical Task Analysis on Arithmetic (From The Clinical Teacher for Special Education by L. Schwartz and A. Oseroff, 1975. Tallahassee: Florida State University.)

SKILL AREA: RIDING A PUBLIC BUS*Task Sequence*

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Walks to correct corner and bus stop. 2. Stands at proper location at bus stop and exhibits appropriate social skills. 3. Identifies bus by reading location or asks driver if this bus goes to the desired location. 4. Boards bus and deposits correct change (two quarters or five dimes). 5. Asks for transfer if desired. 6. Pays for transfer if desired. 7. Finds seat and exhibits appropriate social behavior. 8. Identifies landmarks along route. 9. Gets off at appropriate stop or requests stop by ringing buzzer. 10. Departs bus within 15 to 20 seconds after bus stops. 11. Continues to desired destination. <p>If transfer is required:</p> <ol style="list-style-type: none"> 12. Walks to correct corner and bus stop. | <ol style="list-style-type: none"> 13. Stands at proper location at bus stop and exhibits appropriate social skills. 14. Identifies bus by reading location or asks driver if this bus goes to the desired location. 15. Boards bus and hands driver the transfer slip or token. 16. Finds seat and exhibits appropriate social behavior. 17. Identifies landmarks along route. 18. Gets off at appropriate stop or requests stop by ringing buzzer. 19. Departs bus within 15 to 20 seconds after bus stop. 20. Continues to desired destination. <p>Program for the following uncontrollable variables:</p> <ol style="list-style-type: none"> 1. Bus never arrives. 2. Bus is late. 3. Driver is rude. 4. Other passengers are rude. 5. No seats are available. |
|--|---|

■ **FIGURE 3.5**
Sample of Bus-Riding Task Sequence



IDEA FILE



There are different ways to use task analyses to develop effective guides for determining what skills to teach and in what order the skills should be presented. Practice in analyzing tasks is the one sure way teachers can become good at developing skill sequences.

- For analyzing complex tasks, gather a team to participate in analysis. Parents and regular education high school students are examples of people who can be useful in helping the teacher to task analyze a skill. Often, two people riding a bus will be able to analyze the task more thoroughly than one person could. If two people ride the same route at different times and their analyses are compared, a more detailed task analysis will be the product.

- A stack of 3 x 5 inch cards can be valuable when task analyzing complex skills such as opening and managing a checking account or shopping for groceries. Each step on the task analysis (subskill) can be assigned to one card. The teacher can then spread the cards out over a large table or on the floor and attempt various sequential arrangements until the most appropriate analysis is found. This method prevents the erasures and discarding of paper that are inevitable when an analysis is written in a conventional format. Moreover, as individual learners require modifications in the original analysis, the new substeps generated can easily be added on cards and filed in sequential order. The bus-riding task analysis shown in Figure 3.5 was designed in this fashion. Each skill was placed on a card and moved about until the final sequence was agreed upon by those involved.
 - At a later time, if a skill requires that a complete objective be written, it can be done on the same 3 x 5 inch card.
 - Before using a task analysis with the students, run a trial on other people, for example, a group of regular education students. Mistakes in the original analysis can often be discovered before exposing the retarded learners to any errors such as steps that are too difficult.
 - If the equipment is available, it may be helpful to videotape certain highly critical community skills such as crossing a busy intersection or completing a complex industrial assembly task. Videotapes allow practitioners to review and re-review segments where complex behaviors require close inspection.
-

Developing More Detailed Skill Sequences

Whether task sequences can be developed once, for large groups of learners, or must be developed individually according to specific student needs appears to depend on the severity of a student's disability. As the severity level increases, the need to tailor the skill sequence to the individual becomes more important. A task analysis for putting on a pair of pants may look markedly different for two learners who suffer from different types of physical handicaps (e.g., one student having no use of his legs, and the other having little use of one arm). Conversely, a task analysis for putting on a pair of pants may look the same for two mildly retarded boys with no physical handicaps.

The process of task analysis also becomes more specific when translating short-term objectives (IEPs) to daily instructional use in lesson plans. For example, the task analysis of reading presented in Figure 3.3 has a skill area under vowels that requires the learner to pronounce diphthongs. A further breakdown of that area would involve identifying the specific diphthongs (ou, ow, oi, oy, aw, ew). Each diphthong essentially becomes a step in the sequence when the teacher develops objectives.

Similarly, a toothbrushing task analysis would contain a step involving the removal of the cap from a toothpaste container. An individual retarded learner may have difficulty with this specific step. Consequently, the teacher must include additional subtasks such as exercise to increase muscle strength and practice with larger container tops.



KEY CONCEPTS



- Task analyses can be divided into three categories or types: hierarchical (e.g., reading and arithmetic), procedural (e.g., toothbrushing), and combination (e.g., riding a bus).
- The approach that may be the most useful for analyzing community-based skills is the combination approach. Many community skills will require a student to perform both cognitive skills (reading) and psychomotor skills (crossing the street).
- Developing a task analysis is often a *chaining* process whereby each step (subskill) is linked together with the next step (subskill), thereby cueing the learner to perform the next step in the chain. For example, in a toothbrushing chain, the removal of the cap on the toothpaste container *signals* the next step in the chain (squeezing toothpaste on the brush).
- Chaining is accomplished by linking subskills together in either a forward or backward fashion. The decision whether to order the subskills in a forward sequence (pour milk from a container, grasp cup, lift cup to lips, drink milk) or a backward sequence (drink milk, lift cup to lips, grasp cup, pour milk from container) is generally dependent on the skill and the student's performance level. For instance, a severely retarded learner may take months to be able to accomplish each of the above steps in the simple drinking sequence. In this case, backward chaining would be in order so that the learner could be immediately rewarded by tasting the milk. Many self-care skills such as dressing, eating, and grooming lend themselves to the backward chaining task analysis approach.
- Some skill sequences can lend themselves to either a forward or backward approach depending on which works best for a given student. Some students learn to make a bed faster following a forward approach, while some learn faster following a backward chaining process.
- Subskills on a task analysis should be written in measurable terms, and in some cases complete objectives should be written for the subskill (see next section).

Writing Measurable Objectives

Behavioral objectives* (Gronlund, 1970; Mager, 1975; and others) are similar to yardsticks; that is, they are a device by which to measure student progress. These instructional devices assist teachers in organizing their programs into manageable components for teaching. Objectives should be viewed not as an exercise in futility, but as a method to make teachers' jobs more systematic and easier to manage.

The three components of a measurable objective are outcome, context, and criterion (Schwartz & Oseroff, 1975). The outcome component of the objective is simply a statement describing what learners will do after instruction that they

* The term *behavioral objectives* is used here in a general sense to include short-term objectives (IEP) and instructional objectives (IIP or daily lesson plans).

could not do prior to it (Dick & Carey, 1978). This statement is written in behavioral terms so that the teacher can observe the student's performance. For example, the following outcome statements represent possible objectives for retarded learners:

- Correctly *writes* the answer.
- Orally *reproduces* vowel sounds.
- Manually *assembles* the complete set.
- *Orders* a complete meal at a designated restaurant.
- *Holds up* head with no assistance and *looks* in direction of teacher.

The context component specifically outlines the situation the teacher will structure that will allow the student to perform the behavior identified in the content area. This sets the stage for the conditions of the learning environment. Using the previous examples, the objectives begin to take shape as follows:

Outcome: Student will correctly write the answers.

Context: Twenty written double-digit addition problems with and without regrouping.

Outcome: Student will orally reproduce the sounds.

Context: Taped demonstration of vowel sounds.

Outcome: Student will manually assemble the complete set.

Context: Given a disassembled lawn mower carburetor and screwdriver.

Outcome: Student will independently ride the bus from point A to point B.

Context: Upon request from supervisor, including oral information concerning departure time.

Outcome: Student will order a complete meal consisting of one main course, dessert, and a drink.

Context: Given a limited amount of money and taken to a designated restaurant.

Outcome: Student holds head up independently and looks in direction of teacher.

Context: When teacher calls student's name.

The final component of a well-written objective involves establishing the criteria for success. Here the teacher considers what criteria must be met before the learner will have adequate skills for continuing to the next step in the learning hierarchy. The teacher can decide whether the criteria can be adjusted up or down to match the learner's strengths or weaknesses. An erroneous conception is that 90% correct is a standard for mastery. This magical number may not be appropriate, based on individual students or on different types of tasks. Conceivably, five different students in the same classroom could be working on the same annual goal and the same short-term objective, yet have varying criteria for success based on their individual needs. Referring to the previous examples, the criteria might be as follows:

Outcome: Student will correctly write the answers.

Context: Twenty written double-digit addition problems with and without regrouping.

Criterion: Eighteen out of twenty correct.

Outcome: Student will orally produce vowel sounds.

Context: Taped demonstration of vowel sounds.

Criterion: 100% correct articulation of all sounds.

Outcome: Student will manually assemble the complete set.

Context: Given a disassembled lawn mower carburetor and screwdriver.

Criterion: 100% correct for all steps on the task analysis.

Outcome: Student will independently ride bus from point A to point B.

Context: Upon request from supervisor, including oral information concerning departure time.

Criterion: Arrival at point B.

Outcome: Student will order a complete meal consisting of one main course, dessert, and a drink.

Context: Given a limited amount of money and taken to a designated restaurant.

Criterion: Four out of five trials.

Outcome: Student holds up head independently and looks at teacher.

Context: When teacher calls student's name.

Criterion: Each trial.

The measurement unit chosen for each criterion is dependent on how the data will be recorded. For example, when dealing with academic skills, teachers may wish to use a quality measure such as percentages. As the number of problems or questions changes from day to day, the standard of percent correct can maintain a relatively stable measure, and thereby facilitate charting of progress. Effective criteria can also be measured by rate (number of correct problems per minute), frequency (percentage of correct trials), duration (length of time the behavior occurred), and latency (length of time that passed before the behavior began).

The process of task analysis and the procedure for writing measurable objectives are interwoven. It may be helpful to highlight and expand upon the diphthong example from the previous section here. During the *needs assessment* (steps 1 and 2, Figure 3.2) the teacher may have discovered that while attending the third grade regular class (mainstreaming), Joanne, a mildly retarded student, is being exposed to reading exercises that are requiring her to decode unknown words—a task which she is having a great deal of difficulty performing. A potential *annual goal* for Joanne might be to *improve her decoding skills when presented with unknown words* (step 3, Figure 3.2).

The arrows between steps 3a and 3b and steps 4a and 4b represent the translation or task analysis of decoding into its component parts. In the case of an academic skill such as decoding, it is likely that task analysis of the skills has already been done and is commercially available (e.g., Stephens, Hartman, & Lucas, 1982).

For example, a general task analysis for decoding skills usually includes: (1) short vowels; (2) long vowels; (3) initial consonants; (4) medial consonants; (5) final consonants; (6) diphthongs; (7) digraphs; and (8) blends. (For another example, refer to Figure 3.3.) The *translation* that is mentioned in steps 4a and 4b involves writing a measurable objective for each of the eight areas if such objectives do not exist.

Highlighting diphthongs, a possible *short-term objective* might be the following:

Outcome: The student will recognize and pronounce the sounds ou, ow, oi, oy, aw, er.

Context: Thirty whole words on the second and third grade levels.

Criterion: Between 80% and 90% accuracy.

In this example, the task analysis was used to identify the steps in decoding, and the teacher then was able to translate the steps into measurable objectives.

A second example, involving a severely or profoundly retarded learner, may help to demonstrate that the process is the same—only the outcomes change. During the needs assessment phase (steps 1 and 2, Figure 3.2), teachers' discussions with Steve's parents and visits to Steve's home have identified the need for increased leisure/recreation skill training. The information from the CNA highlights the fact that Steve, upon returning home from school, spends his entire time in his wheelchair in front of the television set. A potential *annual goal* for Steve might be to instruct Steve in a number of potential leisure/recreation activities found in and around his home; also, to provide Steve with a means to communicate his choice from a number of available leisure/recreation activities.

The task analysis of this annual goal is more difficult only in the sense that it must be completed on-site (at Steve's house) with the assistance of his parents. Potential skills in the task sequence might include the following possibilities (all located in Steve's home): (1) playing a video game; (2) listening to a talking book; and (3) listening to music. As with the example on decoding, the *translation* (steps 4a and b) involves converting each of the three leisure activities into potential short-term objectives.

Taking the example of the talking book, a possible *short-term objective* (IEP) might be:

Outcome: Student will select a talking book tape, place tape in recorder, and turn on the recorder.

Context: Selection from ten talking books.

Criterion: [Selection not critical.] Correct manipulation of tape and recorder.

The selection of tapes is not a critical component of the criterion since the teacher's job at a later stage will be to expose the student to a variety of options. Rather, the crucial criterion is that Steve learn to manipulate the equipment independently or with some adaptation, so that a choice can be made by Steve as to whether or not he wishes to engage in this activity.

Using task analysis as the vehicle for moving from potential annual goals to potential short-term objectives is the first level of the curriculum design process. The identical sequence of steps occurs once more when task analysis becomes the vehicle for moving from short-term objectives (IEP) to smaller bits of instruction termed *instructional* or *daily objectives* (IIP or lesson plans).

ASSESSING PRESENT LEVEL OF PERFORMANCE

Assessment and curriculum are complexly interwoven, and separating them into different components may weaken the entire system. For the assessment of a student's present level of performance (IEP) and an ongoing monitoring of student progress (IEP and IIP), several evaluative tools and procedures must be employed. A complete discussion of the assessment process will be presented in a later chapter. However, there are several important considerations for curriculum development that are appropriate to discuss here.

Identifying Prerequisite Skills

As teachers are notified of the students they will be teaching, they can begin to identify potential curricula that may be appropriate for these learners. Therefore, global curricular areas can be identified (e.g., self-help skills for the profoundly retarded). This process becomes more systematic as additional data on the students are gathered and present levels of performance are pinpointed. A number of resources and methods are available for accomplishing this data collection.

First, the teacher should inspect each learner's permanent records, noting information such as absentee patterns, time of onset of learning problems, previous test scores, and previous teacher observations (Moran, 1979). Information from records can be valuable in a number of ways. For example, a deficit in crucial basic skills can often be traced to a particularly long absence period at a time when instruction in those skills was being given. Similarly, studying previous test scores often pinpoints discrepancies with current assessment results, indicating possible errors in the testing process, loss of skills, or gains in student abilities.

Teacher observations, if written in behavioral terms and supported by data, can often alert teachers to potential problems that need immediate attention. Teachers must treat observations from former colleagues with caution, however, since in many cases they reflect a subjective opinion. For example, the statement that "Student A is exhibiting extremely violent behaviors" may adversely affect a teacher's expectation of this learner. Conversely, if the statement reads that "Student A punches other students on an average of three times a day," the teacher has data-based facts with which to work. In this case, the possibility of cueing the class to ignore the occurrence may be sufficient to eliminate or decrease the inappropriate behavior.

Effectively identifying student prerequisite behaviors may also minimize unnecessary assessment efforts. Often teachers can judge where to begin intensive

assessment with a student when they have analyzed previous records. Consideration of instruction in the academic areas can provide an illustration of this. For example, a student's records may indicate a long absence during one school year. By estimating the skills that were to be taught during that time, the teacher can begin to evaluate the student's proficiency in those skills. The teacher also has the option to return to the most basic skills in the sequence and begin testing there. Beginning at the bottom, however, may result in a loss of time that could be spent in instruction. Inspecting student records is merely a survey method to place the teacher "in the ballpark" when beginning to evaluate student characteristics. Other data collected on a learner's entry behavior assist in establishing a clearer picture of student needs.

Student Behavior Important to Instruction (Learning Styles)

Teachers must be constantly observant of behaviors exhibited by students that can affect learning. As previously mentioned, student records can sometimes alert the teacher to behaviors that may influence performance. The best assessment of these behaviors, however, will generally occur when the student enters the classroom and the teacher can observe various interactions within the environment. For example, a severely retarded individual who engages in repeated self-stimulating behaviors needs to have these movements decreased if they interfere with learning. Similarly, teachers should note affective entry behaviors of students such as task completion, risk-taking, and other social behaviors (e.g., cooperation within the group, ability to follow spoken or written directions).

Potential Reinforcers

At the outset, teachers must begin compiling lists regarding potential reinforcers that may affect each of their students' behaviors. This process begins by noting whether the learner appears to be reinforced intrinsically or extrinsically. In addition, an important notation would be whether the student relies only upon immediate reinforcement or can tolerate having reinforcement delayed to a later time (an important vocational prerequisite).

Observation is the most useful method for identifying reinforcers for individual learners; however, interviewing the student will often help. Teachers may also have to develop structured situations where the student can be exposed to several reinforcers. Observations can then be made to identify rewards that are most potent for specific learners.



KEY CONCEPTS



The point of assessing student entry behavior is simply to gain an initial understanding of learner strengths, weaknesses, and needs. These data can be collected by

analyzing student records (including interviewing parents and past teachers) and observing the learner upon entry into the program.

The collected information is used in two ways. First, an overview profile of the learner is developed using data outlining entry behavior as described in this section. Initial data (e.g., prerequisite behaviors) are used to place the student in position for the second step, which involves further assessment with standardized and criterion-referenced measures. Pinpointing specific student strengths and weaknesses is discussed in detail in Chapter Four. All entry behavior data assist the teacher in placing students at levels that most appropriately meet their needs.

- Reviewing students' files can be considered one activity in the CNA (steps 1 & 2, Figure 3.2). The information obtained may be of assistance in establishing potential annual goals and short-term objectives.
- Observing student learning styles as well as potential reinforcers can be considered part of the assessment of present level of performance (step 5). This information aids the teacher in deciding what specific goals and objectives are appropriate for a given retarded learner.

THE IEP: ANNUAL GOALS, SHORT-TERM OBJECTIVES

After an individual retarded student has been thoroughly assessed (see Chapter Four) and a list of strengths and weaknesses has been generated as a result, the identification of appropriate annual goals and short-term objectives can begin (step 7, Figure 3.2). The information obtained from the needs assessment and the potential goals/objectives generated were used as guidelines against which students' present levels of performance were assessed. By the nature of their disabilities, retarded learners will have many deficit areas that could be targeted for instruction. However, listing all possible instructional areas on an IEP is not prudent. Rather, the rule is that only those objectives that might reasonably be taught to a student *in one school year* should be included on the IEP. (Table 3.7 and 3.8 provide examples of IEPs.)

The problem is how to decide which of the potential goals and objectives should be included in the individual's curriculum. One reason for allowing the IEP committee to make these judgments is that the committee is comprised of members (including the students themselves) who should best know the needs of the students. However, there are some criteria that teachers and other committee members can use to judge whether or not goals and objectives are appropriate. The following is a list of possible criteria which may be helpful in establishing priorities for learning:

1. *Age of the learner:* Beyond a certain age, remediating academic deficits may not be desirable and some form of compensatory skill may be more appropriate. For example, a mildly retarded high-school-age student may learn to use a calculator exclusively to solve math problems encountered in daily living. Short-term objec-

TABLE 3.7 Sample of IEP

Name <u>Stephanie W.</u>	Date of Development <u>4-1-83</u>
School <u>Chase School</u>	IEP From <u>8/29/83</u> to <u>6/5/84</u>
Current Placement <u>Chase School</u>	
Date of Birth <u>March 10, 1973</u>	IEP Committee
Age <u>10</u>	Dr. Jones Principal _____
	Mrs. Barnes Regular class teacher _____
	Ms. Couch Special education teacher _____
	Ms. Smith Psychologist _____
	Mr. & Mrs. W. Parents _____

Special Education and Related Services	Start Date	End Date	Responsibility
Speech and Communication	Oct. 1, 1983	June, 1984	Ms. Ball
Remedial Reading	Oct. 1, 1983	Jan., 1984	Mr. Moss
Resource Room Remedial Help	Oct. 1, 1983	June, 1984	Ms. Couch

Evaluation Data				Extent of Regular Class Placement
WISC-R (5-83)	Verbal	Performance	Full Scale	60% Regular Education
Key Math (6-83)				40% Special Education (Resource)
Woodcock Reading Mastery (6-83)				

Present Level of Performance	Annual Goal Statements	Short-Term Objectives	Evaluation Procedure
<p>Strengths:</p> <ol style="list-style-type: none"> Can sound out consonant-vowel-consonant words. Can read 90% words from Dolch word list Level 1. Can read orally at instructional level from second grade passage. 	<ol style="list-style-type: none"> Student will correctly read out loud all consonants imbedded in the words from a 2nd grade passage Student will read sight words at second grade level. Student will comprehend material read at second grade level. 	<ol style="list-style-type: none"> <p>1.4 OUTCOME: Consonant blends (pl, sm, cr, fr, tr, gr, pr, bl, sl, st, sw, cl, dr, br, sp) CONTEXT: When presented in a word (pronounce whole word) CRITERIA: 50 words—90%—100%</p> Given Dolch word list, Level 2, student will read words with 90% accuracy. Given 100-word passage at second grade level, student will demonstrate recall of directly stated specific details by answering teacher-made questions with 100% accuracy. Given a 100-word passage at second grade level, student will answer sequencing questions with 100% accuracy. 	<p>50 nonsense words with initial consonant blends. Teacher reads ending, student supplies beginning sound.</p> <p>Probe sheet—20 words w/initial consonant blends</p> <p>Dolch word list</p> <p>Five teacher-made questions</p> <p>Five teacher-made questions</p>
<p>Weaknesses</p> <ol style="list-style-type: none"> Doesn't know second grade sight words. Cannot decode words with beginning/ending consonant blends. Cannot answer comprehension questions based on main idea, specific details, and sequencing directly stated in second grade passage. 			

(Prepared by Tina Kinsley)

TABLE 3.8 Sample IEP

<i>Present Level of Performance</i>	<i>Annual Goal Statements</i>	<i>Short-Term Objectives</i>	<i>Evaluation Procedure</i>
<i>Strengths:</i>			
1. Tells time to the hour.	1.0 Student will improve grooming.	1.1 OUTCOME: Wash and blow-dry hair with no assistance	See context and criteria for all objectives. Charting of percentage correct steps on task analysis.
2. Average five motor skills.	2.0 Student will improve home management skills.	CONTEXT: Shampoo Blow-dryer Towel	
3. Is ambulatory.	3.0 Student will improve vocationally related behaviors.	Sink (school & home)	
4. Has good receptive language.		CRITERIA: 100% of steps on task analysis over 1 month, twice a week	
5. Makes needs known with one-word requests.		2.0 OUTCOME: Make toast	
<i>Weaknesses:</i>			
1. Waves hands for long periods of time.		CONTEXT: Toaster Loaf of bread Butter and knife	
2. Has short attention span.		CRITERIA: 100% of steps on task analysis over 5 days	
3. Hits others.		3.0 OUTCOME: Care of plants— transplanting, watering, etc.	
4. Has poor self-help skills.		CONTEXT: Flower garden Vegetable garden (school)	
5. Has poor gross motor skills.		CRITERIA: Successfully transplant and care for three house plants over a period of 6 months.	
6. Has poor posture.			

tives involving calculator use (the calculator is included in the context component of the objective) may be more desirable than objectives that reflect practice on math worksheets.

- Prerequisite skills:* Priority may be given to those skills that must be mastered before other skills can be learned. A disruptive student may need to learn more appropriate behaviors before he or she can move on to more advanced skills.
- Community validity:* The skills should be ones that the students can quickly generalize to the community. Students learning to read sight words, for example, might

have better success if the words chosen reflect those they see on a daily basis (e.g., words on menus in fast food restaurants). Information from the CNA (e.g., opinions of parents) should provide a basis on which to judge the validity of a given skill.

4. *Resource availability*: There may be times when the necessary materials and expertise are not available for teaching a skill. If this is the case, and alternative solutions cannot be generated, the decision to put off teaching the skill (if not critical to the student's life) may be a possibility. For example, if the student is not scheduled to leave the program in the next year, in-school training involving the same subject areas (e.g., cooking, cleaning, budgeting) may be substituted for a placement for training in a community program.



KEY CONCEPTS



- The final product of assessment is the development of a list of strengths and weaknesses that become the foundation for short-term objectives.
- Older students may benefit from learning compensatory academic skills rather than attempting to remediate basic skills.
- Short-term objectives in any curricular area should reflect some form of relevance to the community.

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ASSESSMENT OF RETARDED LEARNERS

■ Educators have at times looked to the field of medicine for a conceptual base on which to develop programs for retarded learners. Consequently, the term *diagnostic-prescriptive* has become popular for describing the relationship between assessment and instruction (Lerner, 1981). *Diagnosis* refers to identifying the reasons why students are failing to learn targeted skills. This process could involve pinpointing factors such as a student's learning style, preferred reinforcers, and the point on a skill sequence where instruction is not leading to student progress.

Prescription refers to the methods and materials teachers choose to use with students based on the strengths and weaknesses identified during the diagnosis phase. Thus, the process of teaching is ongoing and all of the parts are interrelated. A teacher would have a difficult time deciding where to begin instruction without a thorough assessment of the student's present level of performance. The previous chapter on curriculum design introduced the concept of objective-based assessment—measuring learner progress in relation to prestated goals and criteria. The underlying tenets for the curriculum chapter can also serve as a basis for this chapter. That is, all students are different, and teachers need to be familiar with these differences in learning styles before appropriate instruction can be developed. Curriculum design and assessment are interwoven, and one process will not necessarily precede the other.

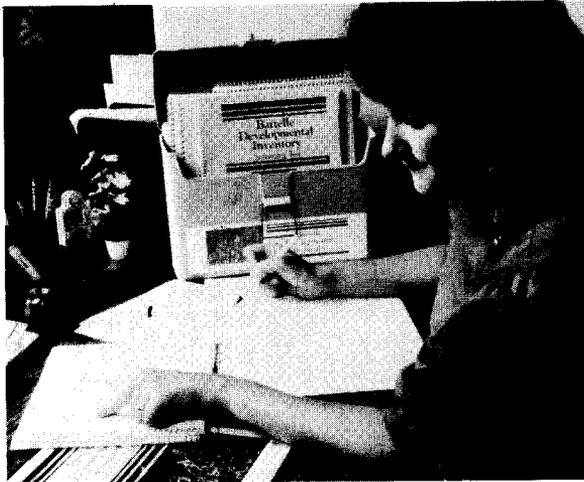
The purpose of this chapter is to present teachers with a systematic approach for gathering assessment data that will be useful in program development. Generating assessment data for their own sake—without a clear, concise plan for why the information is needed—may be counterproductive. The main goal, then, is to demonstrate how teachers identify the information that is most important for developing daily lessons.

GOALS OF ASSESSMENT

For teachers, assessment increases in importance after students are placed. Students who have problems are referred to the school psychologist or psychometrist for in-depth evaluation to determine the most appropriate classroom placement. After the assessment is complete and an IEP meeting is convened, the learner may be placed in a special education classroom.

This is when the teacher's job begins. Formal testing done by the school psychologist is valuable for obtaining general information about the academic and behavioral performance of students; however, this information cannot stand alone. In developing instructional programs, consideration must be given to the unique qualities inherent in each teacher's class. Different professionals have varied styles of teaching, their classrooms have a variety of materials, and their presentation of skills can be disparate. Consequently, any psychologist will find it difficult to predict how a student will react from teacher to teacher if only a formal battery of tests is given in isolation. An alternative is to rely on the assessment of the teachers who know a student best when planning educational strategies.

For example, Norman's general education teacher realizes that Norman continues to fall behind the class in reading. This teacher consults with a special education teacher to develop a comprehensive assessment package that addresses specific areas delineated as important. The data are then collected by each teacher as designated. Information gathered from these sources can feed directly into developing an effective intervention for teaching the target skills. Using this system, eventual placement into special education may be possible. However, Norman's



Assessment identifies information most important for developing daily lessons. (Courtesy of DLM Teaching Resources, Allen, Texas)

strengths and weaknesses will need to be identified by the professionals working with him on a daily basis. Transition time should be minimized. Placement into the special education program will be based on data demonstrating that Norman's needs will best be met there.



IDEA FILE



Effective special educators need to be competent in several areas of assessment such as selecting appropriate tests; correctly administering a variety of tests; managing records; interpreting results of assessment; and making sound decisions based on interpreted data (Lund, Schnapps, & Bijou, 1983; McNutt & Mandlebaum, 1980). In addition, special educators must be thoroughly versed in the legal implications of assessment (Bateman, 1982).

Nonbiased assessment is an important principle of P.L. 94-142 (see Chapter One) and should assist in reducing overrepresentation of minority children in classes for the handicapped (Oakland, 1980). Certain key elements should be carefully observed when assessing students for placement purposes.

- Students should be tested using instruments developed in their dominant language (e.g., Spanish-speaking children should be tested by instruments written in Spanish).
- All medical, visual, and auditory problems and problems resulting from emotional disabilities should be explored prior to evaluating students for educational deficits (Gonzalas, 1982).

LEVELS OF ASSESSMENT

Assessment is an ongoing process and should not be thought of as merely an end-of-the-week quiz or unit test. Rather, assessment is difficult to separate from teaching. The most effective teachers may be the ones who use a systems approach to assessment. These teachers continually sample whether or not they are making an impact on the lives of their students, constantly probing into the teacher-learner interaction and monitoring program effectiveness and subsequent student progress (Scott & Goetz, 1980). To accomplish this, teachers choose from various levels of assessment that vary in intensity and comprehensiveness to assist them in "drawing a picture" of each student's learning style.

Wallace and Larsen (1978) have identified the following three levels of assessment of learning problems:

1. A survey level of assessment resulting in a measure of general classroom performance and initially identifying that a problem exists.
2. An intermediate level of assessment involving administration of diagnostic tests designed to further specify areas of difficulty.

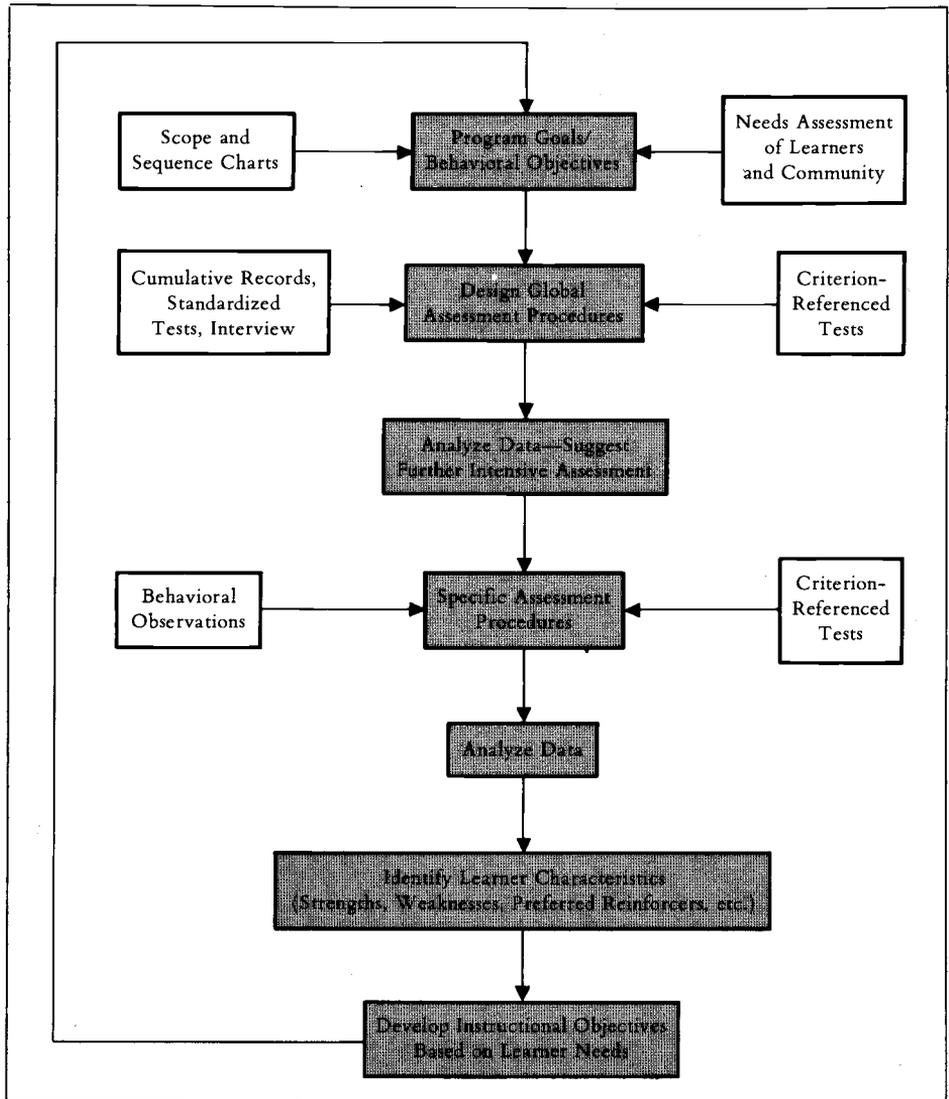
3. An intensive level of assessment resulting in a comprehensive evaluation of the learner including specific diagnostic testing and a study of the home, health status, and other factors.

The process of assessment begins with a broad collection of data concerning general learning problems. As the assessment process continues, the data gathered become more specific, gradually narrowing in focus until specific learner strengths and weaknesses are identified. The assessment results also allow teachers to identify the individual needs of students within different learning environments (Zentall, 1983).

As the IEP is developed, it moves from the broad to the more specific. This approach relates to the levels of assessment as identified by Wallace and Larsen (1978) (see Figure 4.1). First, during the survey level, teachers notice that there is a marked difference between a particular student's performance and that of the rest of the class. The difference in learner progress usually shows up in general screening procedures initiated by the school system, for example, by administration of the California Achievement Test (Tiegs & Clarke, 1970) or in classroom activities developed by the teacher. Once it is suspected that a problem exists that will require an extensive change in programming, the teacher begins to gather general assessment data supporting a referral for further analysis (Algozzine & McGraw, 1980). The information gathered at this level (teacher-made tests, behavioral observations, district screening procedures) sets the stage for implementing the second assessment level needed for IEP development. For example, an elementary student is rapidly falling behind peers in learning to read. Although instruction continues, the teacher begins to collect survey data concerning where skill-related problems appear to be occurring. In this case, data reveal deficits in letter recognition and decoding. With this information, a teacher can either seek the assistance of a psychometrist or continue to the next level of assessment independently.

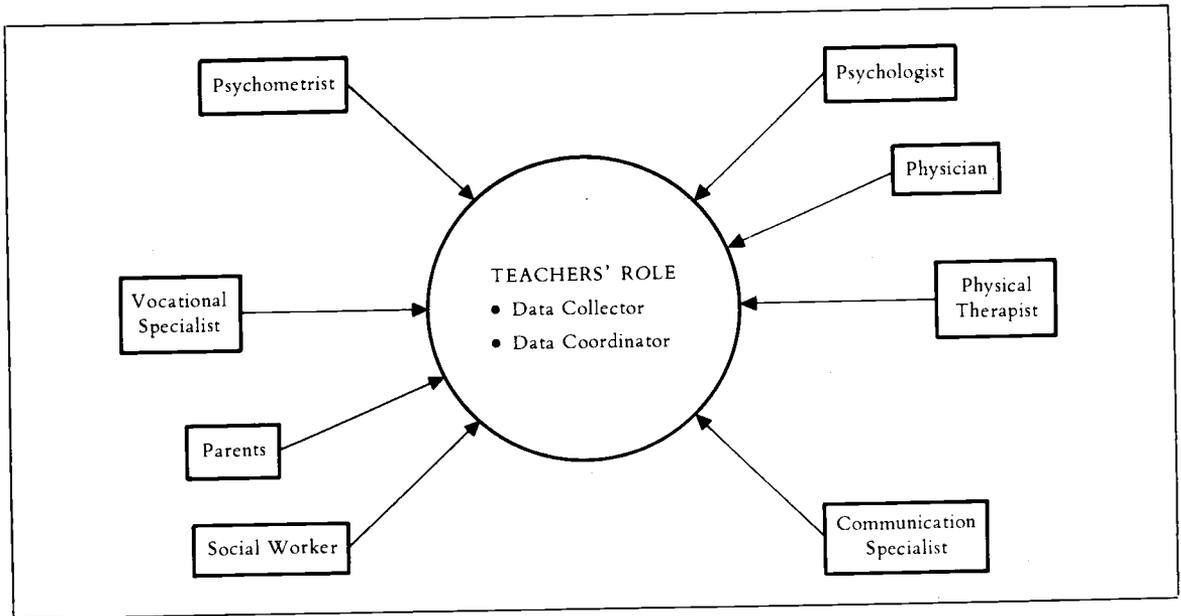
The second or intermediate level of assessment relates to the section of the IEP dealing with the student's current level of performance. Here the teacher gathers data from standardized tests, criterion-referenced measures, and more detailed behavioral observations. These measures can be gathered from different sources such as other teachers, psychometrists, and social workers. However, the teacher who is functioning as coordinator organizes the data for a workable analysis (see Figure 4.2). During this level of assessment, the professional team (teacher, psychometrist, physical therapist, or other professionals) attempts to pinpoint specific deficits in all curricular areas. In addition, information relating to student learning styles and strengths and potential reinforcers are gathered mostly as by-products of the general assessment procedures. For example, a teacher may be assessing a severely retarded learner for possible part-time enrollment in a community sheltered workshop. At this level, an adaptive behavior scale or behavior checklist is administered to pinpoint deficit areas that could hinder learner progress in a workshop environment. Also, learner strengths are identified to further assist in programming decisions. Other pertinent information can also be gathered at this level including medical workups and shop experience.

Finally, the last level of assessment results in an intensive and ongoing evaluation of the learner. Gathering information at this level is the responsibility of



■ **FIGURE 4.1**
Objective-Based Assessment Model for Classroom Implementation

the practitioners who are involved with the learner on a daily basis and who have the ultimate responsibility for program implementation and revision. This intensive level of assessment involves an ongoing evaluation of learner progress. An important fact to remember is that by law the IEP must be evaluated once a year. This requirement may be “too little, too late.” The ongoing monitoring of student performance is the most important assessment task, and this responsibility rests primarily with teachers. By monitoring the student on a daily basis, teachers can measure the effectiveness of their instruction and revise it where necessary.



■ FIGURE 4.2
Teacher's Role in Assessment Process

The levels of assessment demonstrate important features in their relation to the IEP process (refer to Figure 3.2, Chapter Three). As professionals move through the levels, information is gathered in a systematic fashion, moving from broad to specific characteristics. Systematic assessment procedures allow the professional to function in the same manner as a good detective; each bit of information gathered becomes a clue, and enough clues gradually pinpoint a solution. Data gathered at the survey level lead the teacher to apply certain tools at the intermediate level for further clarification. Information gathered at the intermediate level needs further clarification at the intensive level, and the subsequent instructional programming is based on this information. Finally, during the intensive level of assessment, student progress is monitored for feedback into the instructional system. The conceptualization of this process of systematically moving from broad to specific assessment data is important. It is the basis of this chapter. Once this concept is understood, the focus shifts to finding the best sources for collecting assessment data.

SOCIAL VALIDITY AND ASSESSMENT

If teachers take a close look at their classrooms, curricula and school systems, they may find that the programs developed for mentally retarded learners are isolated from everyday community activities. For example, teachers may present lessons on grocery shopping without allowing the class to visit a market, or they may teach community mobility skills in the confines of a classroom. These same

problems can be experienced in the assessment process. The psychometrist who administers a diagnostic evaluation of a learner's computation skills in a strange room may not get a true picture of how the student performs in the classroom.

Professionals are becoming more aware that the concept of social validity (Bailey, 1977) requires educational programs to be in the best interest of learners with regard to both their needs and the needs of their community. The related concept of ecological validity (Brooks & Baumeister, 1977), views mentally retarded learners in complex interactions with their environments. Methods and materials for teaching are developed to instruct the learner in those skills appropriate for community life. Therefore, assessment, if it is to relate to the teaching of community skills, must occur in the learner's natural environments (e.g., home, neighborhood, worksites).

Examples of ecologically valid assessments can be found in the literature related to teaching independent living skills to retarded learners. Behavioral observations and records of learner progress including (a) self-care skills (Fowler, Johnson, Whitman, & Zukotynski, 1978), (b) community mobility (Cortazzo & Sansone, 1969), (c) home and life management skills (Robinson-Wilson, 1977), and (d) leisure activities (Johnson & Bailey, 1977) are made in several settings. The concept of ecological validity would also support programs that allow learners to apply academic skills to everyday living experiences as opposed to practicing academic skills only in workbooks or on dittoed exercise sheets. The charge is to evaluate student needs accurately. Assessment should be taken out of its traditional confines and applied to the learner-community interaction.



IDEA FILE



Teaching mentally retarded students skills directly applicable to both their current and future lives in the community (defined in this text as *community valid skills*) is an important concept for programming. Consequently, teachers must first decide whether what they want to assess is a basic skill to be taught in isolation from the community (e.g., finding the main idea in a story from a basal reader) or a community-valid skill (e.g., reading a story from a newspaper and identifying the main idea). Younger learners will generally spend more time during the school day working on basic skills in traditional activities. Older learners, however, may be allowed the chance to apply arithmetic, reading, and writing skills to community problems. Teachers may wish to consider the following tips as an alternative approach:

- Younger retarded students may benefit from increased exposure to community-valid basic skills instruction. For example, when assessing subtraction skills the teacher might present the students with problems relating to the difference in cost between store items such as toys, candy, and books.
- Teachers may be surprised to find that a student can compute the correct change he receives from a soda machine yet cannot compute the same problem when it is

presented on a written test. For a more accurate appraisal of certain skills, teachers may wish to enlist the aid of parents or volunteers to monitor a student's completion of such community-based tasks.

- As an alternative to writing objectives with traditional academic outcomes, teachers should consider writing the short-term objectives on the IEP in terms relating to community activities. All teaching of basic academic skills occurring during the year would relate to the final community outcome.

Example:

The student will be able to correctly compute the answers to 10 subtraction problems that require regrouping in consecutive places (e.g., 517–358).

Alternative:

The student will be able to locate the prices of used furniture in an ad provided by the teacher and subtract the differences between two couches, two tables, two lamps, and two chairs. The prices included in the ad will require the skills of regrouping in consecutive places.

TEACHER'S ROLE IN ASSESSMENT

We live in a society of specialists—in education, medicine, the trades, and other fields. In education, the assessment specialists are school psychologists and psychometrists. Administrators and teachers often refer learners to testing specialists for diagnostic work-ups. Although these professionals can provide useful information, teachers may in fact be the best, most reliable source of assessment data (Smith & Neisworth, 1969).

There are definite advantages to giving teachers the central role in learner evaluation. These advantages were voiced in 1969 by Smith and Neisworth and are more recently becoming popular with teacher educators (e.g., Howell & Kaplan, 1980). One advantage is that teachers know their students better than anyone else. This fact is important especially in light of the credence that psychometricians place on establishing rapport with the learner prior to testing. Teachers generally have a solid rapport and can assess the learner at times and places that are comfortable to both whereas a professional from outside the classroom is often a stranger with little hope of observing the learner's true performance. In addition, a professional from outside must test the student while adhering to a strict time schedule and subject to availability of testing facilities.

A second advantage to having teachers conduct assessment involves the contact they have with students. Teachers are in a position to observe students under varied conditions, including their contact with a variety of peers and others associated with the school. For example, when assessing the prevocational skills of

a severely retarded learner, a teacher has the option to place the student in different situations where target behaviors can be observed (e.g., in the lunchroom and on the playground). This freedom to alter environments allows teachers to obtain a more global picture of learner behaviors. Similarly, when assessing a student's academic skill problems, a teacher can structure activities testing the learner's ability to apply the target skills to a variety of daily living tasks.

Another advantage of teacher involvement in the assessment process relates to program development and accountability. Teachers are familiar with the program goals and objectives that they have developed themselves. Thus, they are in an excellent position to assess students in relation to those goals. Typically, psychometrists use standardized tests to measure academic skills that may not correlate with the curriculum. For example, studies indicate that the Key Math Diagnostic Arithmetic Test (Connolly, Nachtman, & Pritchett, 1971) omits considerable content (Howell & Kaplan, 1980). Therefore, performance on a standardized test may not relate to items taught in the classroom at a given time. Teachers having knowledge of exact program objectives can assess specific skills that are being required in their classroom. In addition, teachers have the responsibility to develop educational interventions and continually revise those interventions as needed. To accomplish this, there must be a system of continuous measurement of learner progress so that decisions can be made concerning appropriate program revisions.

Teachers should view assessment activities as part of their instructional role. The work these activities entail will pay off in the development of more effective instructional strategies.

Developing Assessment Competencies

This section has presented a case for teachers acting as the primary evaluators of their students. Obviously, if teachers develop their program objectives and have the opportunity to observe learners in a number of situations during the school day, then they are the most likely candidates to administer appropriate assessment measures to students. What remains, however, is to provide teachers with the appropriate competencies to effectively measure student behavior. Burnett (1970) identified competency guidelines for teachers that included the following abilities:

1. Identify useful data from past assessment results and observations.
2. Develop informal assessment measures designed to increase the diagnostic information about learner characteristics.
3. Analyze data once they are gathered.
4. Apply the analysis to designing educational interventions.

In addition to these competencies, teachers should be able to analyze assessment data so that they can have adequate feedback for program revision. These competencies provide the scope for the remainder of this chapter.

OBJECTIVE-BASED ASSESSMENT

The process of evaluating student behavior in relation to criterion-referenced goals can be termed *objective-based assessment*. It is the foundation for assessment models described by several authors (Howell & Kaplan, 1980; White & Haring, 1980; Howell, Kaplan, & O'Connell, 1979; Smith, Neisworth, & Greer, 1978; Wallace & Kauffman, 1978; Wallace & Larsen, 1978; Smith, 1969). The process of assessment is dynamic in that it is ongoing and totally interwoven with curriculum design (see Chapter Three). When teachers design program goals and subsequent behavioral objectives, they have actually developed yardsticks by which they can assess student achievement. The highlight of this system is simply the organization and the systematic procedures that it entails.

Teachers begin by identifying the goals and objectives that may be important to the learners and then assessing them in relation to those objectives. Using a system of this nature can answer two important questions, namely, "What do I assess?" and "What do I teach?" This process involves moving from general learning characteristics to more intensive specific assessment aimed at pinpointing the exact needs of the learner.



KEY CONCEPTS



The process of assessment is one that moves from screening broad learning problems to identifying specific strengths and weaknesses. Teachers play an integral part in every level of assessment and should be active as equal partners with psychologists, psychometrists, and administrators.

- During screening, the teacher may be the first to recognize that a student is having a problem and refer the student for testing according to district policy. Any information that the teacher can provide the psychometrist (e.g., class work, program objectives) will be helpful.
- Information regarding present level of performance for the IEP may be most useful if gathered by the student's teachers.
- Daily monitoring of student progress towards IEP objectives is a must. This monitoring helps the teacher relate the quality of instruction to how the student is doing.
- Assessment should relate to the activities retarded students will be expected to accomplish in the community.

OVERVIEW OF ASSESSMENT METHODS

Standardized Academic Measures

Standardized tests are in wide use in the field of education and are also known as formal or norm-referenced measures. These commercially produced measures

require administration by trained professionals, including teachers, and they provide results that allow comparisons between the learner and other students on a national or regional basis. There are various levels of standardized tests (e.g., achievement and diagnostic tests) and methods of administration (e.g., group and individually applied). Therefore, teachers have a choice of which tests they wish to administer based on the information they will yield. This chapter does not include a comprehensive description of available tests, their applications, or their quality. For that information the reader is referred to excellent books by Salvia and Ysseldyke (1985), and Wallace & Larsen (1978). An excellent source for critiques of specific tests is Buros's *Eighth Mental Measurements Yearbook* (1978).

Professionals may, at times, inappropriately use group achievement tests to place and subsequently program for learners. Group achievement test results are valuable only for screening for gross learning problems—a process similar to finding a basketball in a medium-sized haystack. In the same light, individually administered achievement tests, although somewhat more appropriate, again only provide broad information concerning learning problems (see Table 4.1). Teachers should not feel that results from these tests are futile. Rather, this level of testing needs to be placed in proper perspective, that is, achievement testing is a method to quickly ascertain general learner problems and suggest more specific diagnostic testing. Under no circumstances, at least for retarded learners, are achievement tests sensitive enough to measure daily progress, much less program effectiveness.

Diagnostic tests generally are characterized by their administration to individuals and their testing of more specific skills in designated subject areas. Therefore, subtests on a diagnostic arithmetic test cover cluster goal areas such as basic operations, numeration, time, and money. Similarly, a diagnostic reading test includes subtests covering areas such as word attack, sight vocabulary, and comprehension. These diagnostic tests can provide a global picture (yet one that is more

TABLE 4.1 *Examples of Commercially Produced Tests That Can Provide Information for a General Level Assessment of Academic Skills*

<i>Name of Test</i>	<i>Skills Covered</i>	<i>Appropriateness for Students</i>	<i>Type of Reference</i>
<i>Reading</i>			
California Reading Tests Tiegs & Clark (1970) California Test Bureau Los Angeles	Vocabulary Reading comprehension	Grades 1–High School Group Test	Normed
Diagnostic Reading Scales Spache (1972) California Test Bureau Monterey	Oral reading Comprehension	Grades 1–8 Individual	Normed
Woodcock Reading Mastery Tests Woodcock (1974) American Guidance Service Circle Pines, MN	Letter identification Word identification Word attack Word comprehension Passage comprehension	Grades K–12 Individual	Normed

TABLE 4.1 (Continued)

<i>Name of Test</i>	<i>Skills Covered</i>	<i>Appropriateness for Students</i>	<i>Type of Reference</i>
<i>Arithmetic</i>			
Key Math Connolly, Nachtman & Pritchett (1971) American Guidance Service Circle Pines, MN	Basic operations Fractions Numeration Word problems Money Measurement Symbols Time Geometry	Grades K-8 Individual	Normed
Stanford Diagnostic Arithmetic Test Beatty, Madden, & Gardner (1966) Harcourt, Brace, Jovanovich Orlando, FL	Basic Operations Decimals Fractions Percent Counting	Grades 1-High School Individual	Normed
<i>Spelling</i>			
The Test of Written Spelling Larsen & Hammill (1976) Empiric Press (Pro Ed.) Austin, TX	Dictated words	Grades 1-8 Individual	Normed
<i>General Achievement</i>			
Peabody Individual Achievement Test (PIAT) Dunn & Markwardt (1970) American Guidance Service Circle Pines, MN	Mathematics Reading recognition Reading comprehension Spelling General information	Grades K-12 Individual	Normed
<i>General Diagnostic</i>			
Criterion Test of Basic Skills (CTBS) Lundell, Evans, & Brown (1976) Academic Therapy Pub. San Rafael, CA.	Reading Arithmetic	Individual	Criterion-referenced
Brigance Diagnostic Inventory of Basic Skills Brigance (1977) Curriculum Associates Woburn, MA	Readiness Reading Mathematics Language Arts	Very comprehensive All students with academic learning problems Individual	Criterion-referenced

detailed than achievement tests) of a learner's abilities in a particular subject area in a relatively short time. A test of this nature also allows teachers to use systematic procedures when students first enter their programs. This characteristic of diagnostic tests is valuable, especially when a new student is placed with a new teacher and a quick, relatively reliable technique is needed to profile the learning needs of the student (See Table 4.1).

Master teachers who have in-depth experience with academic evaluation realize that information from an achievement or diagnostic measure has minimal value when the test was administered by another professional. In cases where someone other than the teacher administers a test, various problems associated with standardized testing such as overgeneralization of findings, lack of teaching information, and child/administrator variability become accentuated (Wallace & Larsen, 1978). Therefore, the relative usefulness of these types of evaluations relies on whether or not the teacher can participate with the student in the testing process to view behaviors and become familiar with test content in relation to program goals.

This section has presented some of the more cogent and pragmatic arguments concerning standardized academic testing. Readers will notice the lack of discussion concerning measures of intelligence. This omission was not an oversight, but a planned strategy to make a point. Setting aside all arguments either supporting or refuting the value of intelligence testing, scores yielded by these measures have almost no benefit to teachers in designing educational programs for retarded learners.

The IQ score generated by intelligence is an indicator of the relative success or failure of a student in the academically based public school system. Therefore, these scores are used as one of several indicators for initial identification and placement. Programming concerns for retarded students begin where the identification (screening) process ends. The role of teachers is in program development and in realistically identifying the curricular areas of benefit to retarded learners. With this in mind, the next section is concerned with a general level of assessment of those skills that benefit retarded learners by assisting them in becoming as independent as possible in community living.

Standardized Social Competency Measures

The prevailing goal of many special educators is to teach academic skills by relating them to community living skills. Therefore, the logical connection with social competency, or more appropriately, independent living skills, is evident. Adaptive behavior scales are measures used at the general level of assessment to assess the independent living skills of retarded learners (see Table 4.2). Generally, adaptive behavior scales incorporate various categories such as interpersonal relations and self-help skills, allowing professionals to rate learners on a graduated scale. In order to rate a learner, the professional must either interview someone who intimately knows the student (teacher, parent) or have contact with the learner in observable situations.

TABLE 4.2 Sample of General Level Assessment Instruments for Measuring Adaptive Behaviors

Assessment Instruments	Ages Covered by Scale	Reference	Measurement Techniques	Scores Obtained	Primary Use	Content Covered by Scale	Comments
Adaptive Behavior Inventory for Children (ABIC) Psychological Corporation New York, NY	5-11 years	Norm-referenced Good ethnic group representation	Interview	Scaled scores for each category	Classification decisions	Family Community Peer relations Nonacademic school roles Self-maintenance	Self-maintenance category may have some use with young children, especially where group includes diverse ethnic background.
Adaptive Behavior Scales (Institutional and Public School Version) American Assoc. of Mental Deficiency 5201 Connecticut Ave. Washington, D.C. 20015	Infant +	Norm-referenced	Interview and observation	Percentile that rates student against others according to sex, age, ethnic group, educational placement	Classification decisions	Independent function Physical development Language, etc.	Most of the scale not suitable for preschoolers; independent functioning section may be useful.
Balthazar Scales of Adaptive Behavior Consulting Psychologists Press 577 College Ave. Palo Alto, CA 94306	Infant +	Criterion-referenced	Direct observation	Rating on student's ability to complete task quality measure	Programming	Motor skills Language Social/emotional Self-help Independent living Recreation/leisure	Allows teacher a thorough profile on actual skill attainment.
Cain-Levine Social Competency Scale Consulting Psychologists Press 577 College Ave. Palo Alto, CA 94306	5-13 years Primarily TMR students	Norm-referenced	Interview	Scaled scores	Classification and programming	Self-help Imitative Social-skills Communication	Can be used with young mildly handicapped children.
Camelot Behavioral Checklist Systems P.O. Box 607 Patrons, KS	Infant +	Criterion-referenced	Interview and observation	Scaled scores	Programming	Self-help Independent travel Motor skills Cognition Social/emotional	Can be useful in identifying large deficit areas.
TARC Assessment Inventory for Severely Handicapped Children H & H Enterprises P.O. Box 3342 Lawrence, KS 66044	3 years +	Criterion-referenced	Observation	Scaled scores	Programming	Motor Language Cognition Self-help	Teacher administrators by watching child perform task.
Vineland Social Maturity Scale Educational Testing Service Princeton, NJ	Infant +	Norm-referenced	Interview	Scaled scores	Classification	Self-help Locomotion Communication Self-direction	New version recently on market.

Note. From "Self Help Skills" by J. Langone, 1985. In N. Fallen & W. Umansky (Eds.), *Young Children with Special Needs* (2nd ed.) (p. 376). Columbus: Charles E. Merrill. Copyright 1982 by Charles E. Merrill. Reprinted by permission.

The use of adaptive behavior measures constitutes a general level of assessment designed only to identify the global strengths and weaknesses of the target learner. Inherent problems—the high degree of subjectivity in rating, for example—preclude these devices from being useful for specifically monitoring student progress or assisting in program accountability (Childs, 1982). Adaptive behavior scales are also useful in obtaining a relatively fast assessment of students' severe deficits that hinder independent living. In addition, once a learner's global deficit areas and relative strengths have been identified, the teacher can proceed in identifying appropriate assessment tools that will be more specific in pinpointing areas needing matching interventions.

Criterion-Referenced Testing

Technically, criterion-referenced testing and informal assessment are different. Criterion-referenced testing (CRT) is based on a behavioral objective including a specific criterion that a student must meet to master the task, while informal assessment involves measuring the learner in relation to specific content with no set criterion. In practice, the two forms of assessment have essentially become synonymous. What actually occurs at this level of assessment is a combination of the two procedures; objectives for a student are based on preset criteria, and yet the learner is informally tested without the specific directions and normative data of formal tests. For purposes of clarity, the term *criterion-referenced tests* will be used here to include components from both procedures.

CRT should not be viewed as unsophisticated or unsystematic because it is referred to as informal testing. On the contrary, this particular type of assessment can yield the most important and often most intensive information for program development. At the specific or intensive level of assessment, teachers identify from general information gathered (e.g., formal procedures at the global level) exactly what areas of learning need further scrutiny. Using CRT, the teacher can design very specific measures to assess learner performance based on objectives in a specific area of the curriculum. For example, a teacher may have information on a severely retarded student obtained from administration of a Cain-Levine Social Competency Scale (Cain, Levine, & Elzey, 1963). Data from this measure may indicate that the learner is performing below a designated norm in communication skills, specifically in the area of communicating wants or needs. This information is important because it alerts the teacher to initial problems; however, there is generally not enough information provided to make appropriate programming decisions. Therefore, the teacher would then develop objectives specifying the conditions under which the behavior will occur (e.g., when the class is questioned, the student will communicate the need to use the restroom facilities) and with a preset criterion (e.g., successful elimination after each request).

A similar illustration of assessing academic performance of a mildly retarded student might begin with information from a diagnostic reading test identifying severe deficits in decoding skills (see Table 4.1). The next step is to further assess each of the decoding areas that is suspect by first developing behavioral objectives

that relate to each identified skill. An example of an objective that could be used as a basis for intensive assessment might be:

Context: Given a printed list of 20 prefixes.

Outcome: Student will be able to point to each prefix and say it correctly.

Criterion: 18 out of 20 correct.

In this case, the teacher now can develop a test and obtain a measure of student performance based exactly on the objective. Similar objectives can be written for each of the skills within the cluster goal of decoding using various commercially produced scope and sequence charts for guides (see Chapter Three).

The preceding section on CRT was designed to describe how assessment moves from the formal or general level to the informal and more intensive level of measuring learner performance. Within this intensive level of assessment there is an additional method of gathering data that is often the most valuable technique for measuring specified behaviors of retarded learners. Systematic observation allows the teacher to assess the learner's application of skills or identify the lack of such skills in naturalistic settings (classrooms, community environments) on a daily basis. If observation measures are designed and implemented appropriately, reliable information can be gathered that meets the rigorous standards of social validity.

Observation as an Assessment Tool

The foundation for designing a high-quality observation system is the operational definition of the behavior(s) in question. If the behaviors have not been defined in terms that are measurable (i.e., they can be seen, heard, or touched), then the data collected by the system will be questionable. The test for defining a behavior is simply this: Can two independent observers record the defined qualities of the behavior and be fairly reliable as to the occurrence or nonoccurrence of the stated qualities (at least 80% of the time)? This requirement of defining behaviors in observable, measurable terms can be met provided the behavioral objectives for the student are written accurately. That is, if the context, outcome, and criterion are included in the objective, the necessary components for observation will be present.



CASE STUDY



Laronda was a student in Mr. Moss's class who was exhibiting behavior problems. One day in the teachers' lounge Mr. Moss lamented that Laronda was driving him crazy by acting out more and more frequently.

"I know what you mean," said Ms. Barnes. "She's acting out more in my class too. Why, just yesterday she spent my entire math period passing notes to her

friends!" Mr. Moss looked at her with a puzzled expression. "That's interesting. But when I say she's acting out I mean that she jumps out of her seat during lessons to do things that can wait until a later time."

Listening with interest was Mr. Vader, the school psychologist, who had just finished reading an article about observation and analysis of behavior. "The problem you two are having," he said, "is that you both have different ideas about what the problem is. You need to *operationally define* 'acting out' as a class of behaviors."

After Mr. Vader explained to Mr. Moss and Ms. Barnes that operational definitions describe the behavior in such a way that it can be either counted (number of times the behavior occurred) or timed (how long the behavior was exhibited), the teachers set about trying to be more precise. The operational definition they devised would now allow them to assess Laronda's unproductive behavior:

Acting out occurs when Laronda ceases doing the assigned task either by looking away from her work for more than one minute or by standing and leaving the work area. If Laronda looks away or stands in order to ask a question about her work, it will not be counted as an occurrence of acting out.

Another component of systematically observing behavior results in the recording of events other than the behavior itself (Mercer & Mercer, 1981). In order to adequately assess behaviors in relationship to a learner's environment, the teacher must also record events that happen prior to the target behavior (antecedent events) and events occurring after the behavior (consequences). The same criterion of rigor in behavioral definitions holds true in either case. Knowledge of such occurrences is vital when assessing learner behaviors, because teachers can more appropriately design an intervention when they can make decisions based on events that are influencing and interacting with the student in question.

Recording Systems

Once important behaviors have been defined in observable, quantifiable terms, the next step involves designing an appropriate measurement system for collecting the necessary data. Hall (1971) identified five techniques that can be used to record the frequency of defined behaviors: continuous recording; event recording; duration measures; interval recording; and time sampling procedures.

Continuous recording systems allow the teacher to observe and record in anecdotal format behaviors occurring at a given time. This system requires the observer to state the specific behaviors in operational format. Continuous recording systems are useful in identifying those antecedent consequences that are important for eventual programming. For example, if a middle school EMR student is

engaging in a number of fights while attending mainstreamed classes, the teachers involved first record all the happenings prior to each fight. If there is an obvious cause such as the student's reacting to being called "retard," the teachers will have a better idea of how to correct the problem. Continuous recording should, in most instances, be a first step because the recording of antecedent events can often lead to a common-sense solution.

A second type of recording system is called event recording. This system involves a simple frequency count, noting the occurrence of specified behaviors. For example, a teacher may record the number of times Jeff pokes his peers during the school day or the number of times Theresa has a temper tantrum.

Duration recording is a useful measurement system for those behaviors that do not have a clear onset and offset. That is, teachers come in contact with behaviors that have no discrete reference points, making it impossible to count the number of times the behaviors occurred (e.g., some types of off-task behavior such as daydreaming). When dealing with behaviors of this nature, it becomes necessary to measure the behavior in terms of the length of time that it occurs, noted as duration of occurrence. Theresa's temper tantrum is a behavior that can dictate the type of measurement system used. If the temper tantrums are short and have a clear beginning and end, a simple frequency count could be used. However, behaviors such as this ordinarily do not occur in a nice, concise form. Spontaneous outbursts often occur in varying lengths and intensity, making them difficult to predict. Therefore, a duration measure can be used to assess the length of the occurrence. Subsequent interventions will be designed to shorten the duration of the behavior.

A fourth observation system measures behaviors that are erratic—those that start and stop or continue for long periods without warning. Interval recording systems are characterized by establishing a defined period of time (e.g., 10 minutes) and dividing that time period into standard subcomponents (e.g., 20-second intervals). Observers can then watch a behavior in relation to each interval and record either of two possibilities: (1) the behavior occurred or did not occur during the interval (frequency); or (2) the behavior lasted for the entire interval (duration). Over the period of 10 minutes in which the behavior is recorded, the teacher can compute the total data, such as the percentage of time that behavior occurred or the total length of time the behavior was exhibited. Information such as this gives the teacher a benchmark to compare the resulting behavior with after the intervention has been implemented (e.g., percentage of intervals when the behavior decreases).

Time sampling, another technique used to measure behaviors, is a method similar to interval recording with one important difference: the observation is not continuous. Teachers may not have the time to watch target learners continually. Instead, teachers may interrupt their schedule occasionally to observe and record certain behaviors. For example, a teacher may look up from a group lesson every 5 minutes to record whether a student working independently is on-task. Similarly, a teacher may record behaviors of a group interaction where different students are observed and their behavior recorded every 3 minutes. In either case, this system allows teachers the freedom to perform additional tasks along with the observation process.

Task Analysis and Assessment

Task analysis actually has two uses. First, a task analysis allows the teacher to develop a management system that structures a learning task in a logical teaching sequence. This use of task analysis relates it to curriculum design. Second, task analysis can be a method of assessment when it is used to compare learner progress to specific steps in the instructional sequence. The use of task analysis as an assessment tool is discussed here.

The skill of developing task analyses should be practiced based on the information presented in Chapter Three. If there were a request to analyze the goal of division or the goal of self-feeding, the teacher could develop a breakdown of the steps involved in sequential order from least to most demanding. These substeps, when learned in the same order, would lead the student to perform increasingly more complex tasks. Repeating this process for a specified number of behavioral objectives would result in the learner's being proficient in the given cluster goal area. The relationship between task analysis and assessment will be further clarified in the following paragraphs.

Each step on a given task analysis is the yardstick by which to assess student performance. For example, a behavioral objective under the self-feeding cluster may state, "Student will be able to swallow pureed food when presented by the teacher." This objective will be broken down into additional components that may include (1) opening mouth with prompt; (2) allowing teacher to place food in mouth; (3) keeping food in mouth; (4) closing mouth; (5) swallowing food after throat has been stroked; and (6) swallowing food without assistance of prompt. Using the objective and its components as an assessment tool, the teacher then merely records how the learner responds at each level of the instructional analysis. Given a task sequence of academic skills, the teacher can follow the same process (see Figure 4.3).

Using task analysis as an instructional tool has become increasingly important to teachers. Once a task analysis of a particular skill area has been completed, the teacher has a "blueprint" for assessing behaviors, teaching new skills, and subsequently modifying the program. This flexibility in the task analysis approach also allows it to work well in conjunction with other assessment techniques.

Task analysis is not, however, a casual process. The ability to develop high-quality task sequences involves a logical thought process and the ability to observe the fine details of how a task is completed.

For example, a task analysis of reading comprehension might include basic steps such as identifying the main idea, pinpointing details, drawing logical conclusions, and making inferences. These areas may be broken down further, however, with the sequenced skills written in behavioral format. The teacher then develops criterion-referenced tests or administers a standardized test to gather information on student progress in each of the stated areas. Similarly, a task analysis for teaching the motor skills necessary for a profoundly retarded learner to hold her head up might entail various steps; for example, holding the head up at one-, two-, or three-second intervals while sitting and while lying on the stomach. These steps could also be incorporated into various activities such as eating. In any case, once



Task analysis helps the teacher to structure a learning task in a logical teaching sequence and to assess learned behaviors. (Courtesy of Glynn County Public Schools, Georgia)

<i>Goal Area:</i>	Phonetic Analysis—Reading
<i>Cluster Goal:</i>	Student will be able to recognize and read in context words containing consonant variants.
<i>Short-term Objective:</i>	
<i>Context:</i>	Second grade passage to be read orally.
<i>Outcome:</i>	Words, including all consonant variants.
<i>Criterion:</i>	95% of the targeted words must be correctly read.
<i>Subskills:</i>	Soft or hard c Soft or hard g Silent sound of letter when in kn, wr, gn blends Final sounds of gh/f

■ FIGURE 4.3

Sample Task Analysis for One Area of Phonetic Analysis of Reading.

the blueprint of the task analysis has been developed, the teacher can include an observation component that allows a trained observer to record student progress.

This section includes assessment techniques that should be used, and in most cases developed, by teachers for collecting assessment data on mentally retarded learners. Data must be interwoven with program development and teaching, allowing the results of assessment to aid the teacher in making appropriate instructional decisions.

Scores can provide valuable information for monitoring purposes, just as a body temperature that is too high or too low can indicate the presence of a health problem. Assessment scores, such as a score from a standardized reading test indicating a deficit area in decoding, can be valuable to a teacher when they are (a) based on preset criteria, or (b) used for global assessment purposes. Unfortunately, some teachers may find themselves totally relying on various test scores. For example, to such teachers grades may have become an end in and of themselves instead of being the monitoring system they are intended to be.



KEY CONCEPTS



- Standardized tests are helpful for identifying severe deficit areas in both academic and social skill areas.
- Standardized diagnostic tests of academic skills are most useful when given by the teacher because the teacher can observe student behavior and error patterns that will have an effect on the student's behavior in his or her classroom.
- Criterion-referenced tests (CRTs) can be either commercially produced or developed by the teacher. They are developed from specific objectives, allowing the teacher to compare the student's performance in relation to certain skills instead of in relation to the performance of other students.
- CRTs often provide the most useful information relating to classroom programming because they can be developed with a specific skill area in mind. For example, a teacher working on fractions can develop a CRT that intensively assesses a student in only that area.
- Observation is a valuable assessment tool, especially when dealing with social behaviors, independent living skills, academic skills that are being applied to community problems, and vocational skills.
- Task analysis is both an assessment and teaching tool, providing the teacher with a device to monitor a student's performance against a series of subskills. This approach allows the teacher to identify exactly where the student is having difficulty and where to begin instruction.

Teachers must analyze learner responses to identify error patterns and areas of strength. This process is opposed to viewing a set of scores as the end product of assessment. Gathering only scores from standardized assessment batteries provides little, if any, useful information for teaching. Conversely, teachers should gather assessment data that allows them to make competent programmatic decisions. The

next section of this chapter presents a pragmatic approach to gathering useful data that will assist the teacher in developing effective educational interventions. The format of the following section is based on the IEP process, following sequential steps to demonstrate the importance of assessment and the kind of data needed to develop effective programs.

ASSESSMENT AND THE IEP

Initial assessment of learners to establish their present level of performance provides the foundation for future program development. This level of assessment is crucial for identifying the needs of the student where more intensive investigation is necessary. The teacher's responsibility for appropriate assessment of the learner is paramount, and it begins before the IEP meeting convenes. The teacher plays an important part in the data collection and program development process as well as being an advocate for the student.

Present Levels of Student Performance

Information for establishing a student's present level of performance is collected from three sources: cumulative records and an interview of the student, the parents, and past instructors; standardized tests; and criterion-referenced measures (including observation of student behaviors). The information from these sources must be collected and analyzed prior to IEP development if the data are to be of practical use.

First, a careful inspection of cumulative records, followed by an interview, can produce a wealth of information that will point to the next step in the assessment process. Moran (1979), for example, found that cumulative records can yield valuable data such as deficiencies in academic and social areas, age at onset of difficulties, absenteeism, and testing results in comparison to classroom performance. Identifying noticeable deficits in student behavior can save time when the teacher is deciding the types of diagnostic measures to use. For example, achievement test results located in a learner's record may indicate severe problems in reading. This information can save time by alerting the teacher to this area for intensive analysis. Similarly, information from previous adaptive behavior scales and behavioral checklists can pinpoint areas for further inspection without the teacher's having to repeat screening procedures.

The age of onset of learning problems is especially important for profiling academic skills (Moran, 1979). If records show that the student demonstrated problems when entering school (which should be the case for mildly retarded learners), the indication is a developmental disability. Learners whose deficits do not appear until later grades, however, generally demonstrate learning problems resulting from sources other than mental retardation. This data could aid in interpreting poor test results and signal that placement in classes for the mildly retarded would be inappropriate.

Two final areas indicating the need for more specific assessment are absenteeism and discrepancies between records and classroom performance. Carefully scrutinizing absentee and health records can pinpoint when in a student's career a long illness occurred. This may point to deficits in skills normally taught at that time (Moran, 1979). Absentee and health records can also supply information concerning when during the year certain students may be absent (e.g., in cold weather) and pertinent information concerning vision or hearing, as well as possible medical problems. This level of assessment provides valuable clues to the types of standardized and/or criterion-referenced measures that will be necessary for further analysis.

When information pertaining to student performance on a standardized measure is presented to a teacher, it may have little meaning for program development. Often the most valuable data provided by measures of this nature are not test scores. Rather, the most useful information is what some professionals call "by-products" of assessment. These by-products are what constitute learner characteristics that can only be observed by the astute assessor. Besides the obvious data generated by administering a particular type of test, information such as the following should be noted:

1. *Preferred modality*: Does the student respond better to visual, auditory, or tactile stimuli?
2. *Learning style*: How does the learner respond to unfamiliar questions? Will the learner guess (risk-taker) or refuse to answer (failure avoider)?
3. *Information processing*: Does the learner reason through an answer or quickly attempt the first answer available?
4. *Error patterns*: Does there appear to be patterns of errors that occur in specific skill areas?
5. *Reliance on assistance*: Will the learner attempt to work on the solution to a question alone (independent learner), or does the learner demand constant feedback with questions such as "Is this right?" (dependent learner)?
6. *Hierarchy of reinforcers*: What types of initial reinforcers appear to have positive effects on the learner (e.g., smiles, "good job," etc.)?

To obtain such valuable information, the teacher should have first-hand experience with testing the learner. This can be obtained by closely observing the learner while administering standardized measures.



IDEA FILE



Assessing a student's modality preference and whether or not any changes can be effected in identified deficit areas is a highly controversial issue (e.g., Kavale, 1981; Sternberg & Taylor, 1982); however, there appear to be some data supporting the need to identify preferred modalities when assessing academic skill areas (e.g. Kampwirth & Bates, 1980; Tarver & Dawson, 1978).

Mildly retarded learners could probably benefit if teachers could identify their modality strengths because teachers could then present some information in ways that were easier for the students to grasp. For example, a student with strong auditory perception skills might be allowed to listen to stories on tape while reading a corresponding manuscript.

Assessing Skill Areas with Standardized Tests

Standardized tests also provide a quick, relatively accurate measure for assessing skill areas. For example, the administration of several academic diagnostic tests provides a general profile of student strengths and weaknesses in the designated area. These measures then can identify skill areas where more intensive assessment is necessary. The information generated from these measures can also be of sufficient detail to develop objectives for the IEP. However, before the IEP can be translated into an implementation plan, the teacher will have to gather more intensive information. One word of caution: Students can perform less than their best when presented with a standardized test (Moran, 1979). Teachers should not underestimate the extent to which a student can perform. Often, a student's performance is less than his or her potential for progress.

Teachers may find it impossible to collect data using standardized tests. In this case a number of less formal measures are available including behavioral checklists, informal reading inventories, and teacher-made tests, among others. The goal of administering these measures is the same as it would be if formal tests were used: to establish a global learning profile of the student.

Constructing the Performance Profile

Before an IEP can be adequately developed, a profile of student performance relating to predetermined goals and objectives is required. Therefore, the standardized and CRT measures administered during this pre-IEP level of assessment relate specifically to those outcomes. Once data have been collected and analyzed relative to goals, it will be time for the teacher, parents, and supporting professionals to meet for detailed program development.

For example, the cumulative record of a profoundly retarded learner may contain anecdotal reports denoting questionable self-feeding skills, possible self-abusive behavior, and no apparent toileting programs. This information, although valuable for setting parameters for additional assessment, is far too general for use in making programming decisions. To obtain more specific information the teacher may have to coordinate and in some cases implement the following assessment activities:

1. Request a physical therapist to develop a motor assessment profile.
2. Request a complete medical profile if one is not available (including types of drugs administered and their effects on programming, e.g., drowsiness).

3. Administer an adaptive behavior scale to former teachers and significant others.
4. Observe the learner in his or her current placement and continuously record learner movements, responses to stimuli, and other behaviors.
5. Request a communication profile from the language specialist.
6. Meet informally with each member of the assessment team to discuss the findings.
7. Notify the school administration that sufficient information has been gathered to conduct the IEP meeting.

Importance of the Teacher's Role

Two crucial points are implicit in the seven assessment activities listed. First, teachers may feel that coordinating these activities is not part of their job and will result in additional work. This attitude may be difficult to overcome. Teachers need to realize that a process of this nature actually saves time and can result in less work for the teacher. When learners are placed in a program, the teacher may have to rely on information provided by people they have never met, and information about important areas may not be available. The result is that the teacher must perform additional work to assess the learner adequately, and these tasks have to be completed while responsibility for the rest of the class is pending.

The second point involves the pivotal role of the teacher in the assessment process. In each of the seven assessment activities listed, teacher involvement is vital for two reasons: (1) the teacher can ensure that skills important to the student and related to the classroom are assessed; and (2) the teacher benefits from the knowledge of the specialists and can assimilate data concerning the learner. This last point assists in the development of the more intensive assessment activities needed for program implementation.

The same seven assessment activities would be applied with mildly retarded learners, substituting the use of academically related measures in steps 3 and 4 and eliminating or including assistance from other professionals as needed (e.g., vocational educator). Whatever modifications are made, the process is the same, culminating in information used for IEP decisions.

The next step in the assessment continuum occurs after the IEP has been developed and involves the implementation plan, including the instructional objectives. This level of assessment includes the intensive activities that will be used for both judging learner performance and monitoring student progress.



IDEA FILE



Error analysis is a vital component in the assessment process that is becoming more popular with special educators (e.g., Howell & Kaplan, 1980). Essentially, error analysis involves carefully reviewing a sample of errors that a student is making and hypothesizing the cause for the student's mistakes. This approach should be used with both standardized and criterion-referenced measures by recording the stimulus that was presented to the student and the erroneous response given.

The method presented by Howell and Kaplan (1980) is a simple, yet effective one for teachers to use. Their approach is to develop a table such as the one shown in Table 4.3 and record student errors as they occur.

Analyzing the mistakes of learners appears to be a more important end product of assessment than the mere recording of scores. The error analysis allows the teacher to locate a student's current level of performance in relation to a scope and sequence chart and begin teaching from that point.

Assessment for Revision: Ongoing Monitoring of Learner Progress

Formative Evaluation

Formative evaluation involves a continual monitoring of student progress. Performance is measured against preset instructional objectives chosen specifically for the individual learner. The assessment tools available to the teacher for this level of intensive inspection of skills include both criterion-referenced tests and behavioral observations.

The reader is referred to the example in the previous section involving the profoundly retarded learner. At the first level of the IEP, the behavioral objectives indicate that instruction is necessary in all areas of self-help skills (e.g., eliminating self-abusive behaviors and developing self-feeding and toileting skills). Using the example of self-feeding skills, the teacher would devise a systematic observation system to record existing sucking skills, types and frequency of jaw movements, frequency of tongue thrusting, and other behaviors. During initial assessments the adaptive behavior scale may have indicated a deficit area in the learner's ability to keep food in his mouth rather than in the precise learner movements stated above. A more intensive evaluation would involve counting the number of tongue thrusts occurring under different conditions and at different times. Assessment information of this nature provides a baseline as well as information affecting the type of intervention needed to decrease the number of tongue thrusts, thus facilitating appropriate eating responses.

A similar example can be given for assessing an academic skill. Global assessment procedures may have identified a deficit area in fractions, as pinpointed

TABLE 4.3 Student Error Record

Stimulus	Response	Assumed Cause
$\begin{array}{r} 195 \\ \times 7 \\ \hline 1365 \end{array}$	$\begin{array}{r} 195 \\ \times 7 \\ \hline 735 \end{array}$	Cannot carry in consecutive places.
SHOW BOY	SHOE BY	Does not read diphthongs in context.

by the Key Math Diagnostic Arithmetic Test (Connolly, et al., 1971). From these data and other information (e.g. cumulative records, CRT) adequate behavioral objectives could be written for the IEP. From this point, teachers would devise both criterion-referenced tests based on their instructional analysis and subsequent objectives similar to the following:

Behavioral Objective 1.1

Outcome: 20 numbers including decimals (e.g., 1.75)

Context: Student will be able to correctly write the equivalent fraction.

Criterion: 80%

Instructional Objectives:

1.11 Divide figure into designated number of parts.

1.12 Write fractional parts into which a whole has been divided.

Given a complete instructional analysis of the fraction area (available in a number of scope and sequence charts and commercial teacher manuals), the teacher can intensively assess the learner in relation to the stated objectives. When this step is completed, the teacher will have a profile of the learner's abilities.

Assessment-Instruction Interaction

What occurs in a process of this nature is simply a sequence involving assessment-instruction, and so forth. Explaining differences between the two steps is difficult since they are interwoven throughout the instructional process. For example, a teacher instructing severely retarded learners to brush their teeth will be providing the necessary prompts and reinforcers to increase the probability that the students will master each instructional objective. In addition, that teacher will be recording the success rate of the learners for each objective, thereby collecting ongoing assessment data. Similarly, when a teacher administers to a mildly retarded learner a short test designed to measure progress in reading comprehension, that teacher will spend time reviewing the test with the learner to reinforce appropriate answers, correct existing errors, and generalize skills to the next step in the instructional sequence. In this case interfacing occurs between assessment and instruction.

Probing

Probing is a technique of assessment that results in an ongoing profile of learner progress. The techniques used to probe learner behavior are tools that have been

discussed throughout this chapter: criterion-referenced tests and systematic observation. A unique feature of probes that relates directly to the IEP is that they are frequent and, if possible, they should occur daily. This principle of frequent monitoring is important. By definition, mentally retarded students learn at a slower rate resulting in less obvious gains. Therefore, frequent probing is important because any gains that are made should be an indication of program effectiveness. Conversely, if no student progress occurs the teacher is alerted to program inadequacy. With frequent probing, ineffective teacher techniques, materials, and/or reinforcers will be identified and modified, thereby reducing the amount of time needed for instruction. With all the extra activities and unseen events that occur during the school day, every minute of instructional time is valuable.

A typical sequence of teaching events usually involves scheduling a short time each day for individualized instruction in all categorical areas. That is, for a mildly retarded student the teacher ensures at least 5 minutes of one-to-one instruction in the academic areas designated by assessment data. Also, the teacher arranges for individual guided practice time for the student on the instructional objective(s) covered during the session. The teacher eventually presents the learner



Interfacing between assessment and instruction occurs when the teacher reviews tests with learners to reinforce appropriate answers, correct existing errors, and generalize skills to the next step in the instructional sequence. (Courtesy of DLM Teaching Resources, Allen, Texas)

with a CRT covering what the student was targeted to learn, attempting to measure whether the instruction had an impact. By applying probes of this nature, teachers gather information from assessment measures that are sensitive to student progress. Based on data from the probes, teachers subsequently can make decisions as to whether more practice is needed before continuing to the next objective, a revision of the instructional intervention is required, or the skill has been mastered.

Examples of Ongoing Assessment

To illustrate the important points concerning assessment and its relationship to program evaluation and revision, two brief examples concerning both academic and vocational skill areas are presented here. In the first example, an instructional sequence is to be designed to teach subtraction with the final objective that the learner will subtract by regrouping in alternate places. A typical instructional analysis of subtraction might include at least the following instructional objectives:

1.1 *Context:* Given worksheets requiring written answers, student will be able to

Outcome: Correctly compute subtraction problems.

1.11 With no regrouping.

1.12 Regrouping in each of the decimal places.

1.13 Regrouping consecutively.

1.14 Regrouping alternately.

Criterion: Between 80% and 90% per worksheet

Percentages are used as a quality measure of student performance in this instance because the teacher probably will change the number of problems that will be included in each probe. If the number of problems changes from day to day, a measurement system that will allow comparison between daily performances is necessary. In other words, criterion requirements stated in terms of four problems out of five correct or eight problems out of ten correct cannot be compared because the total number is different. However, if they are converted to percentages, the results become 80% and 80% respectively, demonstrating that the learner is maintaining the quality of performance. Figure 4.4(a) presents an example of how an assessment profile in subtraction can be obtained on a student.

The original CRT of the most complicated subtraction problems indicated a severe deficit in that area, which alerted the teacher to begin instruction with simple facts. The first two sessions resulted in a review for the student based on the scores of both probes. Instructional objective 1.13, however, indicates that the student probably is just learning regrouping in each of the decimal places and the current mode of instruction is having no effect. In this case, the teacher might have decided to break down the instructional sequence into finer steps that included each of the separate decimal places. In addition, decisions to add different or additional cues, change reinforcement schedules, and use more modeling may be made to increase

Cluster Goal (1.0): SUBTRACTION

Behavioral Objective (1.1): Given 15 worksheet problems concerning regrouping alternately, student will be able to correctly write the answers.

Instructional Objectives: Given worksheets requiring written answers, student will be able to correctly compute

1.11 Simple facts

1.12 No regrouping

1.13 Regrouping in each of the decimal places

1.14 Regrouping consecutively

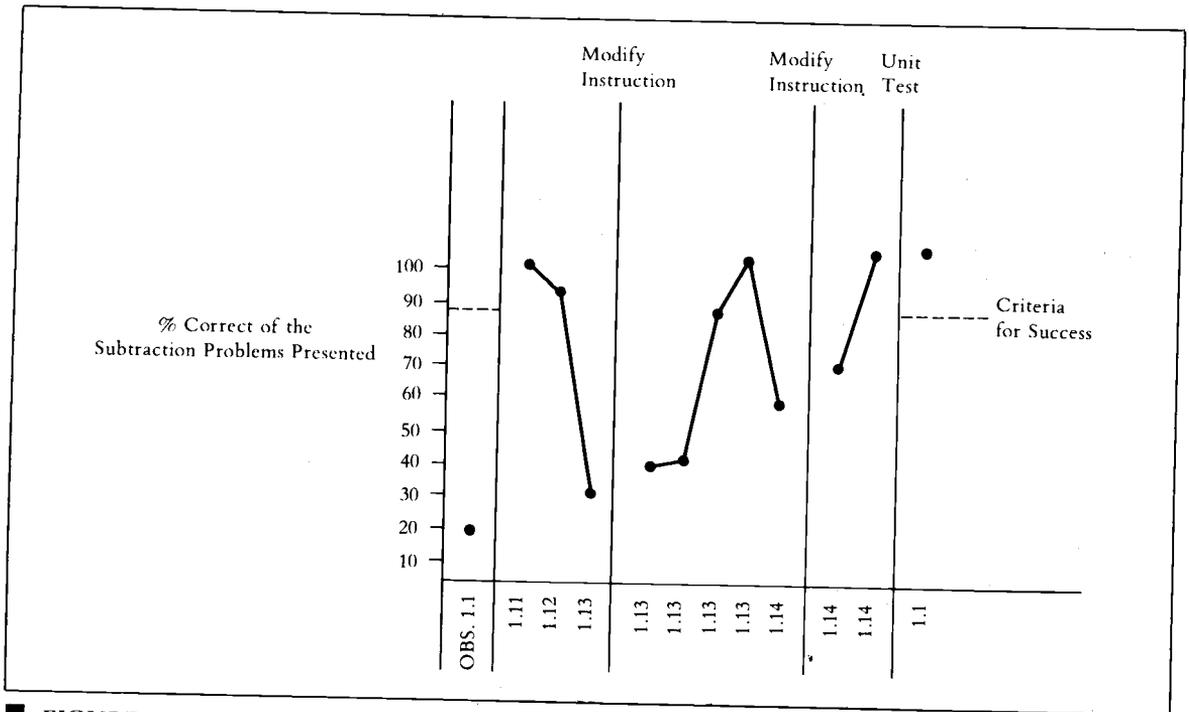
Assessment Results:

<i>Objective</i>	<i>Criterion Expected</i>	<i>Criterion Obtained</i>
Preinstructional assessment: B.O. 1.1	90%	0%
Probes: I.O. 1.11	100%	100%
I.O. 1.12	100%	100%
I.O. 1.13	90%	70%
I.O. 1.13	90%	70%
Decision to revise instruction: I.O. 1.13	90%	90%
I.O. 1.14	90%	80%
I.O. 1.14	90%	90%
B.O. 1.1	90%	90%

■ *FIGURE 4.4(a)*
Sample Assessment Profile—Subtraction

the probability of learner success. In any case, these data indicate that the student met the criterion after the program revision was made. Figure 4.4(b) is self-explanatory, demonstrating the eventual learner success at mastering the unit objectives.

A similar example of how ongoing assessment provides teachers with data for program revision can be illustrated by a process for developing vocationally related skills in moderately and severely retarded learners. To summarize the initial steps, both the special education teacher and the vocational education teacher work together to gather preliminary information about each student's present level of performance. Subsequently, this dual educator team provides the IEP participants



■ FIGURE 4.4(b)
 Example of a Graph Depicting a Profile of a Student's Progress in Subtraction

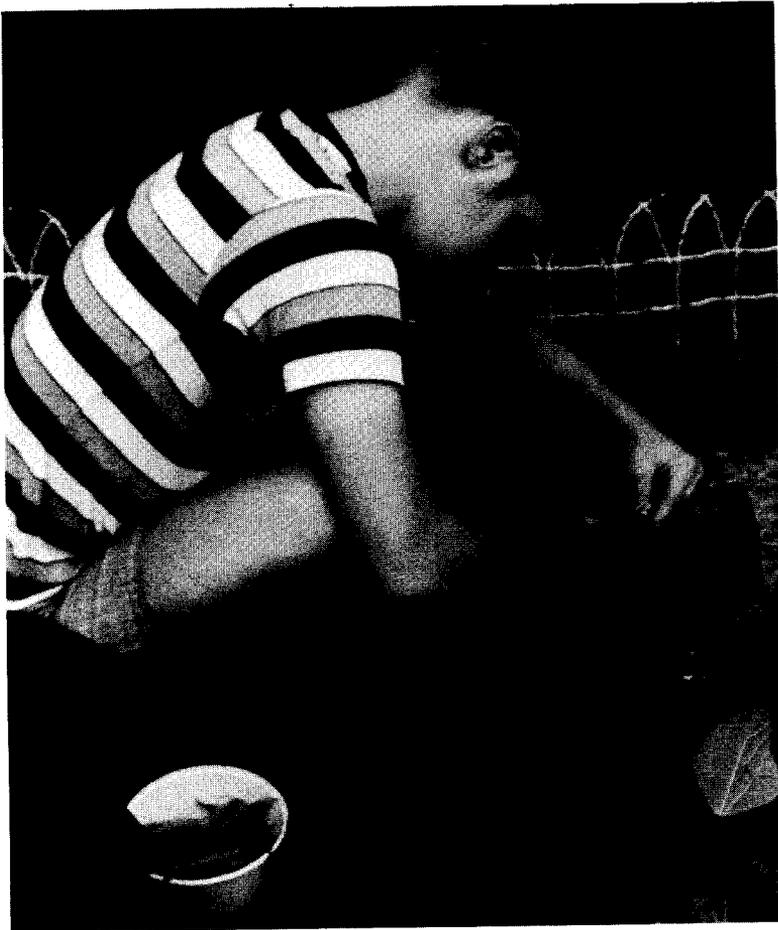
with suggestions based on their findings as to what goals and objectives would be beneficial for the learners. Once the decision has been made concerning modified placement either in an occupational readiness program or a combination readiness and occupational preparation program, the team applies curriculum modification procedures (see Chapter Three) to develop appropriate instructional objectives. For example, a moderately retarded learner who demonstrates appropriate adaptive behavior and motor skills may benefit from vocational training in a horticulture cluster. The following cluster goal and objectives highlight one potential curricular area: horticulture.

Cluster Goal 2.0: Transplanting

Short-Term Objective 2.1: Given any potted plant, with verbal directions to transplant it to another container, student will be able to gather necessary materials and reroot the plant so that at least 98% of the repotted plants survive for a minimum of two weeks.

Sample Instructional Objectives: Given materials and verbal directions, the student will be able to:

- 2.11 Judge whether or not a plant needs watering.



Vocational skills such as gardening illustrate the importance of assessment and its relationship to program evaluation and revision. (Courtesy of Kay Shaw)

- 2.12 Sufficiently water a plant.
- 2.13 Transport potted plants without dropping.
- 2.14 Handle a nonpotted plant without damage.
- 2.15 Root a nonpotted plant.
- Etc.

The objective reflects the content area knowledge of the vocational educator and a technique for assessing contributed by the special educator.

A task analysis format is used in assessing the ongoing performance of the student. Figure 4.5 presents an example of a task analysis including the instruc-

<i>Goal Area:</i>	Horticulture								
<i>Cluster Goal:</i>	Student will be able to transplant plants.								
<i>Short-term Objective:</i>	2.1								
<i>Subskills</i>	1 S	2 E	3 S	4 S	5 I	6 O	7 N	8 S	9
Judge whether or not the plant needs watering.	G	G	VI						
Sufficiently water the plant.	G	G							
Transport the potted plants without dropping.	G	G							
Handle an unpotted plant without damaging it.	G	G							
Root an unpotted plant.	G	G							
<i>Code</i>									
VI: Student completes task with only verbal instruction.									
M: Student completes task with only teacher model.									
PP: Student completes task with only physical prompt.									
G: Student completes task with only guidance.									

■ **FIGURE 4.5**
An Example of a Task Analysis Recording Sheet for Horticulture

tional objectives outlined above. Both educators have contributed to developing this tool. However, once the analysis form has been devised, the vocational specialist can use it to monitor the progress of the learner. As instruction continues, the teacher observes that the student is having difficulty progressing with both instructional objectives 2.14 and 2.15. Using this assessment data, the dual educator team can decide what revisions are needed to increase the probability of learner progress. For example, the data presented in Figure 4.5 should alert the teachers to problems the student is having with controlling fine motor movements. When presented with the delicate task of handling unpotted plants without precise guidance from a teacher or peer-tutor, the student damages the plant. In this case, program modification would require introducing additional instructional objectives that would allow the student to practice control of fine motor movements.

This section has described the process of applying ongoing assessment techniques in an effort to monitor student progress for program revision. The two examples presented provide a basis for understanding the use of assessment data on a continual basis. What remains is to "take a step back" to view the entire instructional system as a whole instead of daily interventions. To accomplish this task, teachers need to reapply assessment techniques similar to those they used to establish the learner's entry behavior on designated behavioral objectives.

Assessment for Program Effectiveness: The IEP Review

In Chapter Three the principle of summative evaluation was discussed. Reviewing the definition, summative evaluation involves gathering information at the completion of the unit that establishes whether student performance matches the preset criteria. The general assessment methods that can be used at this level involve direct product measurement, observational analysis, and learner output. Examples of each of these techniques were presented in Chapter Three. They were also stressed in this chapter. This form of evaluation is essentially a posttest, that is, an assessment based on the behavioral unit objective the results of which are compared with those of a similar measure administered at the program's outset. When the learner entered the system, he or she was assessed in accordance with preset criteria. The results of this assessment delineated what specific objectives were to be the focus of the learner's instructional program. When instruction is completed, the student is presented with the same or a similar assessment measure to note overall progress in the unit of study and to make judgments concerning overall effectiveness of the program.

One more consideration must be addressed during summative evaluation. Generalization and the need to program for it are discussed in a later chapter, but a brief explanation relating to assessment is warranted here. When a retarded learner has successfully completed a unit, the next step in the summative evaluation process is to allow the student to demonstrate those skills under different and/or varying circumstances. In this instance, the teacher requires the learner to perform the skill in different settings, under the supervision of different individuals, using alternative materials and under varying reinforcers or schedules. If the learner fails to accomplish the transfer, the teacher should develop additional program components that will focus on using the learned skills under varied conditions.



KEY CONCEPTS



- Ongoing monitoring of student progress is a vital component of the IEP process and allows the teacher to modify the instructional methods and materials if results indicate that little or no learning is taking place.
- Monitoring a student's daily progress can be done either by using CRTs or by observing student behavior. *Probes*, another term for the frequent monitoring of learner progress, come in many forms. Flashcards, worksheets, workbooks, having students answer questions orally, task analyses for grooming skills, and watching students interact in a group are all examples of probes.
- Converting the data from probes to chart form may help teachers and students to better follow the learning patterns of the person being charted.
- *Summative evaluation* relates to assessing the student's performance over a large block of instruction (e.g., end-of-the-unit test). For example, a student working for 2

weeks on the six subskills of subtraction might have demonstrated sufficient progress that the teacher wishes to assess her over a more complicated area. In this case, the teacher may choose to develop a CRT including a sample of subtraction problems representing all six of the subskills.

- Another aspect of summative evaluation vital for assessing retarded learners involves monitoring the generalization of learned skills to community problems. Thus, if the student in the example passed the unit test on subtraction the teacher would devise another measure that tested the student's ability to use the skills to solve a community-based problem (e.g., balancing a checkbook or conducting a cost comparison between two items in a grocery store).

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DEVELOPING INSTRUCTIONAL INTERVENTIONS, PART I: MEASUREMENT SYSTEMS

■ Some teachers mistakenly believe that assessment and program implementation are separate processes. Information from the previous chapter demonstrated that, in some instances, discriminating between assessment and instruction can be an impossible task. Many teachers use assessment probes to provide immediate feedback to the learner. As they administer the probes, they also demonstrate and prompt correct responses, thus combining both assessment and instruction.

Assessment is an ongoing process; it works alternately with instruction in an assess-instruct-assess-instruct format. Data acquired from the assessment probes feed immediately and directly into the instructional system, facilitating program improvements (Scott & Goetz, 1980). The success of the program is measured by learner progress; therefore, assessment and instructional intervention are virtually dependent upon each other (Walker & Shea, 1984).

The goal of this chapter is to present instructional interventions that are keyed into a continuous assessment system. Chapter content will address current approaches to teaching mentally retarded learners and focus on behavior analysis, an approach which this author and others feel has the strongest empirical foundation (e.g., Sailor & Guess, 1983; Snell, 1983; Wallace & Kauffman, 1978). A large body of the literature regarding mentally retarded individuals demonstrates the extent and success operant procedures have had with this population (Repp, 1983).

APPLIED BEHAVIOR ANALYSIS

Many research studies attempt to measure changes in the behavior of retarded learners while they are members of a group. For example, a statistical research design might be used to measure whether or not a new reading program will be

useful for teaching a group of learners, with success indicated by increasing student scores on standardized reading tests. By choosing participating students based on specific characteristics of a larger group, the researchers hope to generalize their findings to the identified population. Therefore, if the target group of students has increased its reading scores, the generalization is that this program may be effective with the larger group.

The current trend appears to be moving away from the traditional method based on group norms because these norms are seen as inappropriate for teaching mentally retarded learners. These students differ significantly from group norms in both academic and social behavior. Statistical methodology that uses mean scores to represent the total group's behaviors serves only to point out the deviance between the retarded and the general population, a deviance already known to exist. Public Law, 94-142 states that retarded learners need an educational program



Informal assessment—assessment is an ongoing process that works alternately with instruction.
(Courtesy of Clarke County Public Schools, Georgia)

that is individually designed to match their strengths and weaknesses. Therefore, a measurement system that can analyze the learner as an individual and not as a member of a group is desirable.

A Technology for Teaching

A desirable technology for teaching includes a system that identifies the needs of individual learners, applies behavioral techniques to meet those needs, and uses measurement systems that monitor progress frequently. A system that meets these criteria has been developed from years of operant conditioning research paired with the principles of systems design (Lovitt, 1976). Applied behavior analysis (ABA) is a process that is best conceptualized by focusing on the word *applied*. As used here, it refers to the systematic application of operant conditioning principles designed to improve learner behaviors (Sulzer-Azaroff & Mayer, 1977). ABA should not be confused with behavior modification, which is a narrower approach that refers to only the operant procedures themselves. Applied behavior analysis, on the other hand, includes a number of components needed for comprehensive program development such as observing, measuring, and changing the behaviors of learners in their daily environments (Bailey, 1977).

A perusal of the literature will identify a great number of research endeavors demonstrating the effective use of ABA principles with mentally retarded learners, as well as many other handicapped populations (e.g., Polloway & Polloway, 1980; Schilling & Cuvo, 1983). Problems can arise, however, when these well-documented programs are not completely understood and/or inappropriately implemented by practitioners, which is unfortunate since the techniques of ABA can be very useful with retarded learners.

Components of ABA

A classic article by Baer, Wolf, and Risley (1968), described several characteristics of ABA that can provide special educators with a powerful tool for changing learner behavior. First, an ABA program must be *applied*; that is, it must be relevant to the learner for which it was designed.

The concept of "applied" has taken on the added dimension of social validity, supporting the study of behaviors important to retarded individuals and the environments in which they live (Wolf, 1978). Programs guided by this philosophy are not concerned with comparing mentally retarded learners with others. They are concerned with modifying behaviors to improve the quality of a person's life.

A second characteristic of ABA programs is that they are what Baer and colleagues termed *analytic*. Establishing that the teaching procedure used is in fact altering the behavior of the learner is the essential component of the analysis phase. A clear cause-effect relationship must be established between the instruction given

and the learner's behavior. A teacher introducing a positive reinforcer to a learning setting may expect that the reinforced behavior is strengthened. Conversely, if the reinforcer is removed from the learning setting the teacher might expect the behavior to decrease.

A third area delineated by Baer and colleagues (1968) involves the behavioral aspects of ABA, emphasizing Skinner's (1953) discussion of measuring observable behaviors. ABA concerns itself with behaviors that are operationally defined so that an accurate measure can be obtained of how often or how long they occurred. Once the definition has been established, more than one observer should be able to view the behavior concurrently, and the observers should be reliable among themselves concerning the measurement.

Finally, the procedure used to change the behavior must be described in a systematic fashion (Baer, et al., 1968). Precisely describing procedures used to change the behaviors of learners allows others to use the techniques elsewhere. Clearly outlining instructional procedures also provides teachers with opportunities to analyze certain portions of their approach that prove to be ineffective.

When a behavior is targeted for change, any change that occurs must be deemed effective. That is, the change in behavior must be great enough to be of practical significance to the learner (Bailey, 1977). This point is related to the concept of *social validity* mentioned earlier. Wolf (1978) delineated three criteria for social validity:

1. The social significance of the goals. Are the behavioral goals really what society wants?
2. The social appropriateness of the procedures. Do the ends justify the means? That is, do the participants, caregivers, and other consumers consider the treatment procedures acceptable?
3. The social importance of the effects. Are consumers satisfied with the results? All the results, including any unpredicted ones? (p. 207)

Social validity should be a major concern in developing programs for mentally retarded learners. All aspects of the curriculum must be of practical use to the consumer (student). Using the concept of social validity as a guide, teachers will seek input from the learner (where possible), parents, significant others, and the community at large. Making program judgments without such input carries the risk that skills will be taught in isolation with little or no carryover into the learner's out-of-school daily activities.

A final point relating to the effectiveness of ABA involves the generalizability of program results (Baer, Wolf, & Risley, 1968; Bailey, 1977). Practitioners should develop instructional procedures that teach students to generalize new skills to different situations, times, and people, and while using alternative materials. Hoping the skills learned by retarded learners will be generalized to other situations is not enough (Stokes & Baer, 1978). Teachers must consciously program for generalization if they wish it to occur. ABA techniques lend themselves as tools available to teachers for programming the transfer of newly learned skills to community living.



- Applied behavior analysis (ABA) is a systems approach that includes application of behavioral principles (e.g., fixed ratio reinforcement schedules; time out from positive reinforcement); replicability of the procedures used to change behavior; evaluation of the effects of the procedures on behavior; and change in procedures when evaluation results demonstrate that a change is warranted.
 - ABA programs differ from traditional techniques of analyzing change in learner behavior primarily because ABA systems involve direct, frequent measurement of behavior as opposed to infrequent standardized testing procedures.
 - An important concept imbedded within ABA programs is social validity (Wolf, 1978). Social validity is a guideline for designing ABA programs which requires that the behavioral procedures used be designed with the best interests of the student in mind. In the field of special education, one way to interpret social validity is to apply instructional techniques that assist the learner in becoming as independent as possible.
-

Identifying Behaviors Targeted for Change

If the foundation of a newly built house is weak, the structure will not stand the test of time. Starting with an inappropriate definition of learner behaviors is an example of a weak foundation that can adversely affect an educational program. Teachers who do not specify and define the behaviors they wish to change may set the stage for eventual failure of the programs they design.

All objectives in a curriculum for mentally retarded learners can be defined so that the behaviors involved are observable; that is, they can be seen, felt, and/or touched to establish a record of occurrence. For certain behaviors, an observable definition may require timing the behavior to determine the length of occurrence. Teachers should describe *precisely* what they want the learner to do. Statements such as "He annoys me" or "He can't read" do not communicate what changes in behavior the teacher would like to see occur.

All effective programming is built on objectives. The quality of these objectives and whether or not they include the necessary components (see Chapter Three) dictate the success or failure of the intervention (Polloway, Payne, Patton, & Payne, 1985). Therefore, if the objectives are written in measurable terms the first step of the design has been successfully completed. White and Haring (1980) have suggested viewing behaviors in terms of physical movements. They believe that all objectives targeted by practitioners as being "teachable" require the learner to demonstrate some type of movement during or after instruction has occurred. For example, if a learner is asked a question, the expected answer may require the movement of lips to produce the necessary sounds. Likewise, when the learner is presented with an arithmetic problem, the movement might be a written response. White and Haring (1980) defined a movement as ". . . any change in the position of the body" (p. 12). Teachers may find it difficult to visualize a learning situation for

retarded students in which the student would not be required to physically move in some way. In all curricular areas, retarded learners are required to move to demonstrate a skill (or sequence of skills) and to demonstrate the application of some knowledge that has been learned. Therefore, if teachers can describe the movement of the learner when defining a particular behavior, they essentially have written the main part of an objective.

The precision of movement definitions varies among different behaviors. For example, the out-of-seat behaviors of Brenda may be easily counted because her movements away from her chair are obvious and distinct. Jeff's out-of-seat behaviors, however, may not be as clear, requiring a more complete definition of the movement before an accurate measure can be obtained. White and Haring (1980) provided three questions by which teachers can judge the precision of their movement (behavioral) definition:

1. Does the definition allow for more than one type of movement to occur?
 2. Are all the behaviors in a class equally acceptable or important to us?
 3. Would two or more people be able to agree exactly as to when an instance of the desired movement has occurred, how long it occurs, and when it stops occurring?
- (p. 13)

A closer inspection of these three criteria suggests a number of implications for classroom teachers. First, in instances where there may be a number of ways a behavior can be exhibited (e. g., learner may exhibit different methods for holding a toothbrush), the teacher must precisely describe the behavior(s) so that there is no debate as to which form of the behavior is acceptable. On the other hand, if it is not critical, for example, whether students compute addition problems using their fingers or using counting sticks, this also should be stated.

A second implication for teachers involves making decisions concerning the importance of certain behaviors. A behavior considered appropriate by some teachers may be deemed inappropriate by others. When it is important for learners to begin an assembly task by holding one component in their right hand and a second in their left hand (instead of the reverse), this should be outlined in the definition.



CASE STUDY



Mr. Moss and Ms. Tree were having coffee in the lounge and discussing Waldo, a student who was causing trouble in both of their classes.

"I just don't know what to do, Palma," said Mr. Moss. "Waldo is driving me crazy! He's hyperactive and swears in class. On top of all that, his academic functioning is poor. Why, he never understands the answers to questions!"

Ms. Tree looked concerned, and after some thought she said, "Pete, the problem we're both having with Waldo may not be so much Waldo but the trouble we have defining what he does! My professor in this course I'm taking says that we have to define Waldo's behaviors operationally before we can develop procedures to change them."

"Oper. . . what! I said he was hyperactive, swears, and doesn't understand questions," exclaimed Mr. Moss.

"*Operationally defined* means that we define his behaviors in terms of movements," said Ms. Tree. "For example, *hyperactive* might be defined as the number of times Waldo leaves his seat during a 20-minute lesson. *Swearing* might be defined as the exact words you identify as disruptive and the number of times Waldo says these words during a given period of time."

"Palma, those definitions sound reasonable, but what do we do for understanding?"

"Now Pete, calm down. We can define understanding in terms of the percentage of correct answers Waldo gives during an oral question-and-answer period!"

Suddenly Mr. Moss's eyes lit up. "I see what you mean, Palma. By defining the behaviors more precisely we can each attempt to change them in our classes and know we are working on the same things!"

"That's right Pete. Furthermore, we could come into each other's classrooms, watch Waldo's behaviors, and compare the results to see how reliable our system is."

"Palma you're brilliant!"

Finally, the best test of the precision of a definition is whether or not independent observers can simultaneously record and agree on the occurrence or nonoccurrence of the behaviors. For the most part in classroom situations the teacher's judgment concerning behaviors will suffice; however, some mentally retarded learners exhibit behaviors that are difficult to measure. In these instances a



When defining behaviors to be measured, it may be necessary to structure situations where the behaviors occur as frequently as possible. (Courtesy of Kay Shaw)

second, or at times more than two observers, will be required. For example, an accurate measurement of self-abusive behavior in some retarded persons cannot be obtained by one person. Likewise, recording the duration of a student's temper tantrum may require an accurate measure to count the number of minutes it lasts. Measuring the subtle changes in a behavior of this type requires that teachers establish the accurateness of the measurement system by employing additional observers and comparing their results.

For the purpose of defining behaviors, it may be necessary to structure situations where they occur as frequently as possible. These situations are important for retarded learners, who require many trials to learn a specific task. If a behavior is defined so that it may only occur once or twice a day, it may not be sufficient for teaching purposes. For example, this consideration is important when teaching toileting skills to the retarded. To have sufficient opportunities for instruction, a teacher may need to structure the behavioral definitions and the environment to provide frequent opportunities for toileting behaviors. If the teacher waits for natural occurrences of these behaviors, they may be sporadic, and infrequent.

DEVELOPING EFFECTIVE MEASUREMENT SYSTEMS

Developing a precise behavioral measurement system is a vital first step for all teachers of mentally retarded students. Such measurement systems provide a means for analyzing the effectiveness of an ABA program (Sulzer-Azaroff & Mayer, 1977). Measures used to track the progress of students under specified behavioral conditions are required as a component of the IEP (individualized education program). There are a number of techniques of behavioral measurement available to classroom teachers that can be grouped into two categories: (1) direct measurement of permanent products and (2) observational recording of transitory learner behaviors (Cooper, 1981; Sulzer-Azaroff & Mayer, 1977).

Measures of Permanent Products

A measure of a permanent product is a desirable and highly effective method for assessing learner progress. This measurement system allows the teacher to evaluate a product that the learner has generated by demonstrating behaviors that the teacher has targeted for change. Examples include the number of math problems computed, pages read, items assembled, glasses broken, and floors mopped. Unfortunately, even though most teachers use permanent product measures, some do not use them in a systematic fashion, possibly losing valuable learner progress data. Cooper (1981) has summarized a number of techniques that teachers can use to assess permanent products. These techniques have been discussed by a number of different authors (e.g., Bailey, 1977; Sulzer-Azaroff & Mayer, 1977) and have been validated by research (e.g., Johnson & Bailey, 1977).

Frequency and Rate of Behavior

The first technique actually includes two methods, each a mathematical function of the other: measuring frequency of behavior and measuring rate of behavior. Obtaining the frequency at which a behavior occurs involves taking a count of that behavior. For an accurate count, the behavior must be discrete (with a clear beginning and end), and the length of the session must be kept constant. For example, using a frequency measure of a permanent product a teacher could count the number of correct arithmetic problems completed in 10 minutes or the number of pine tree seedlings a student correctly planted in 1 hour. Using permanent products is a desirable technique because it allows the teacher to return to the completed products and compare the progress with newly completed tasks.

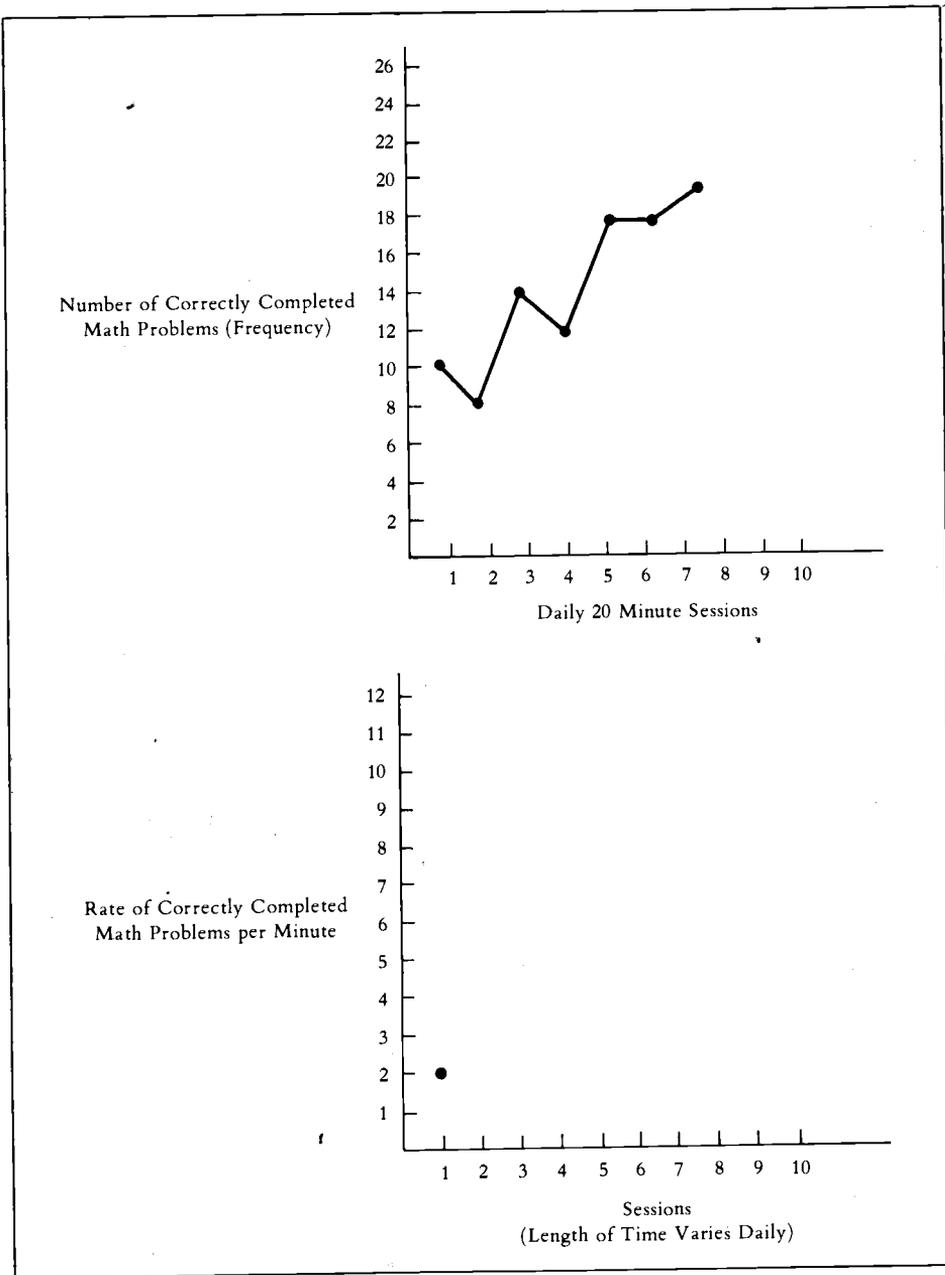
Rate is a function of the frequency count. It is used when the time needed to complete a product is variable. For example, a teacher may require a learner to work on 20 problems for 10 minutes one day, 15 problems for 7 minutes the next day, and so forth. In order for the measure to remain standard, a rate of correctly completed problems is divided by the total number of minutes the learner had to complete the task. The result yielded by this method will be the number of correct problems the learner produced per minute (see Figure 5.1).

Measures involving rate of permanent products can be tremendously useful to teachers of retarded learners. Rate lends itself to measurement of efficiency, a vital prevocational and vocational skill. In many instances, the speed at which workers can correctly complete tasks is a requirement for job success. Using rate as a classroom measure introduces students early to the need for efficiency in their work. In addition, the use of rate as a measure can be an efficient method for data collection. Students can be taught to monitor their own time by recording when the task was completed, thus freeing the teacher from constant supervision.

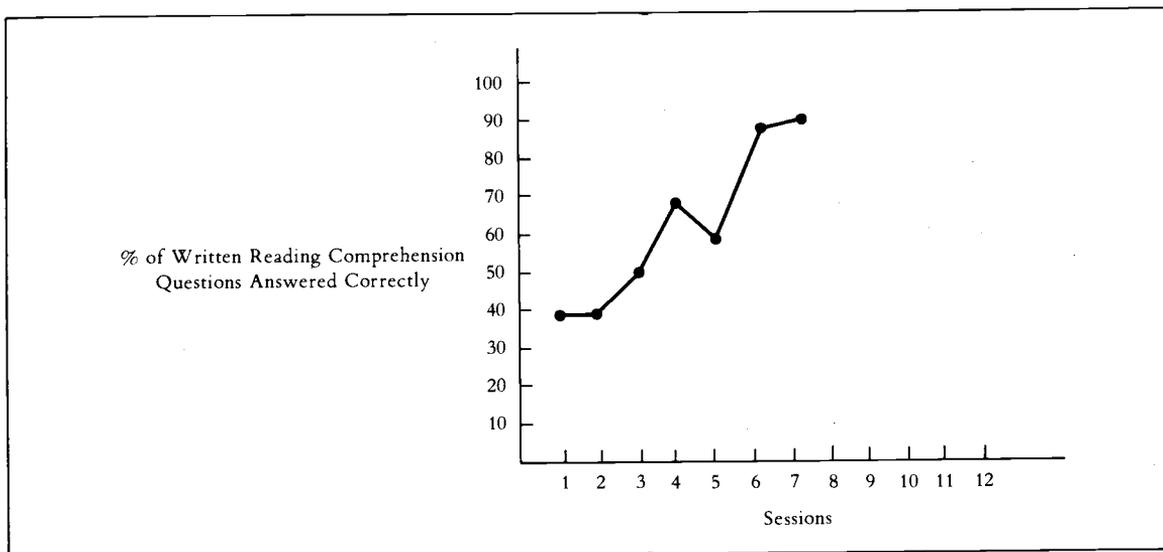
Percentages

One technique of measurement that allows the teacher to follow learner progress across varying numbers of completed tasks is the calculation of percentage of correctly completed products. Percentages are computed by dividing the number of units the learner completed correctly by the total number of units presented. The use of percentages lends itself to monitoring progress in academic skills and is the technique most used by teachers to award grades. There is a problem, however, in using percentages only for grading purposes. Percentages as quality measures have more utility when they are charted, allowing the teacher and learner to obtain a picture of progress made on specified objectives (see Figure 5.2). All basic skills can be monitored using percentages, including the quality of a learner's writing skills, oral communication skills (when a taped permanent product is retained), and computation and reading skills.

There have been a number of research efforts demonstrating the utility of percentages as a measure of ongoing assessment of student permanent product data



■ **FIGURE 5.1**
Two Charts Depicting the Frequency and Rate of Correctly Completed Math Problems



■ **FIGURE 5.2**
 Chart Depicting the Percentage of Written Comprehension Questions Answered Correctly During Seatwork Sessions

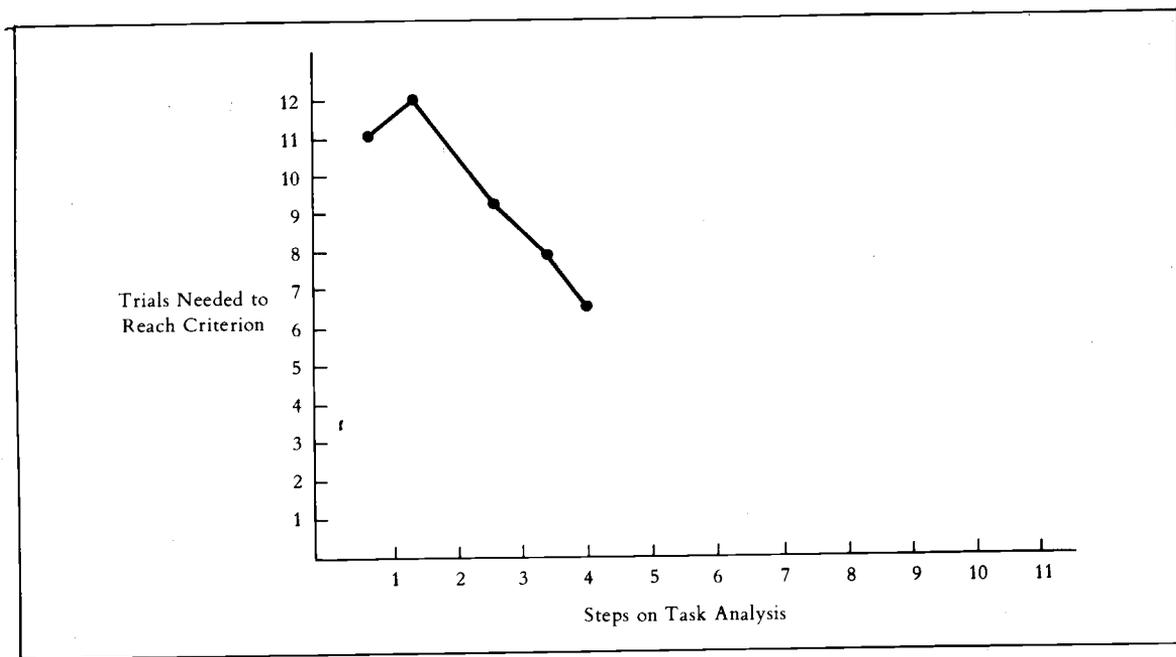
(Cooper, 1981; Lovitt, 1976, 1978). Cooper (1981) has suggested that percentages are a most effective measure when they reflect larger numbers of units. For example, a learner who answers three out of ten items correct reflects a 30% accuracy rate. On the following day the same student might correctly complete four out of ten items for a 40% accuracy rate, resulting in a 10% improvement. However, in such cases teachers should not make hasty judgments about results of their teaching. The use of percentages with smaller units tends to generate spurious results, thereby requiring a longer period of time before judgments about the success of teaching techniques can be made. Referring to Figure 5.2, the reader will note that between any 2 days in sequence, the learner's progress will have increased or decreased by minimum of 10 percentage points. However, when these data are put into perspective for the entire 8 days, a steady pattern of improvement is demonstrated. Generally the larger the number of permanent products (e.g., math problems, reading questions), the more sensitive the system will be to fluctuations in performance. Percentages can be useful for probes with a small number of assessment units if the data are considered over longer periods of time after patterns of progress are established.

Number of Trials to Completion

Other techniques for evaluating permanent products are deviations of or used in conjunction with frequency/rate and percentages. Cooper and Johnson (1979) and later Cooper (1981) discussed four variations, two of which are particularly rele-

vant for use with retarded learners. First, for many retarded learners self-care and prevocational skills are the main curricular areas. In instances where steps or tasks are identified for student completion, a measurement system would be used that records the number of trials needed for the student to learn each step. For example, a severely retarded student may be learning to disassemble, clean, and assemble a carburetor from a lawnmower. For each step in the process, a number of trials will be needed before the learner will master that step and move on to the next one. If the instruction is effective, the teacher will expect to see a gradual reduction in the number of trials needed for the student to successfully complete each step (refer to Figure 5.3). Since the student requires fewer trials to criterion, the data would indicate an improvement in fine motor skills, ability to follow certain directions, and so on.

Percentages can also be used in conjunction with trials to criterion by simply measuring the number of trials that the student correctly completed and dividing it by the total number of trials initiated by the teacher. As instruction progresses and if the interventions are effective, the teacher would expect that the quality of learner responses (percentage of correct trials) would increase. Viewing the previous example from a different perspective, the severely retarded learner now has to improve on the number of trials that he correctly completes. After the student is first presented with the task of removing the adjustment screws from the carburetor, the data should indicate that he had a low percentage of correct trials. However, as instruction progresses, the percentage of correct trials should increase



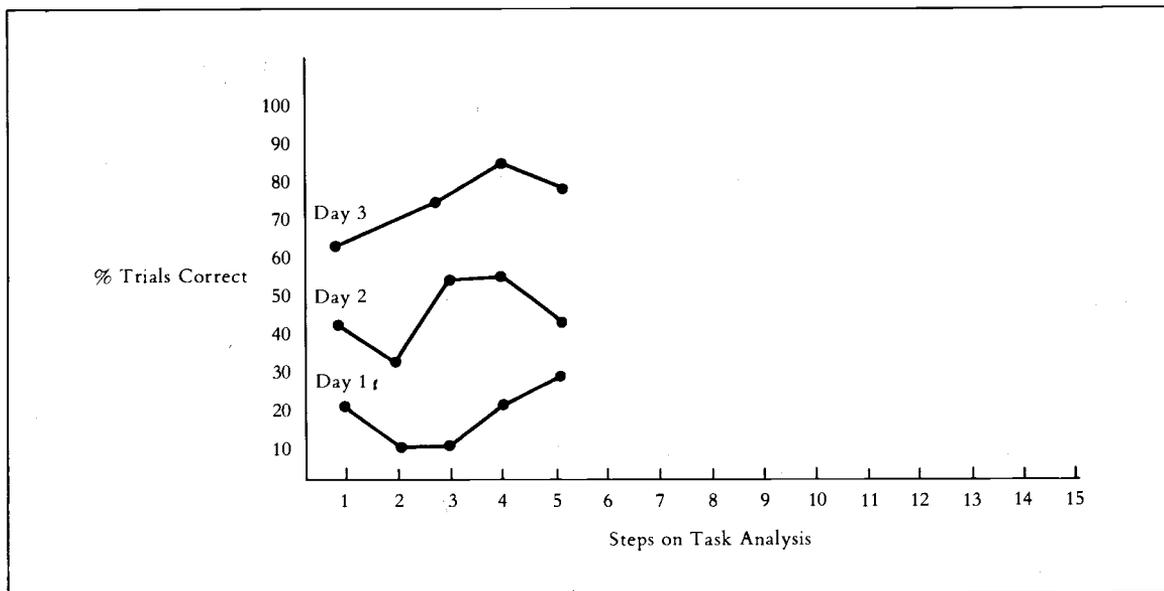
■ FIGURE 5.3

Trials to Criterion in Task Analysis

until the student can correctly complete the entire task at each presentation (see Figure 5.4). Whichever technique is used, the resulting information is basically the same: each presents a different picture of the same behavioral progress.

Task Analysis

A final technique for measuring permanent products is task analysis. A student learning to add numbers follows a set of steps ranging from column addition with no carrying to carrying in alternate places. Taking the example of the carrying in alternate places, the learner must actually perform a multiple-step operation depending on the number of place values in the problem. Each of the steps the learner successfully completes can be counted and charted. The technique of analyzing task complexity can be extremely useful when teaching writing skills. The number or percentage of correctly formed letters is an example of the utility of this technique.



■ FIGURE 5.4
Percentage of Correct Trials to Completion



IDEA FILE



The use of permanent products as a measure of learner progress continues to increase in popularity among teachers. These techniques have a wide range of uses and often are limited only by the teacher's imagination. The following is a short list of examples of how some teachers have used permanent products and how researchers have used these techniques to validate their experimental procedures.

- Hansen (1979) used electronic sensing devices to count the frequency of bedwetting instances for two retarded children.
- Neef, Iwata, and Page (1980) monitored the cumulative number of words students learned to spell correctly.
- Martin, Pallotta-Cornick, Johnstone, and Goyos (1980) used the mean number of units correctly produced to monitor any improvements in work production rates for retarded clients in a sheltered workshop.
- Wood and Flynn (1978) developed 15 criteria for appropriate room cleaning and used them to measure any improvements in room cleanliness exhibited by boys reinforced to complete the tasks.

Other Examples

- Match-to-sample, where a student completes a task by copying the design of a model provided by the teacher (e.g., Student attempts to copy a pegboard design provided by the teacher).
- The number of times in a taped conversation with a peer that the student states his point of view.
- The square feet of floor space that a student mops.

With the availability of videotape equipment and cameras, teachers can now record the completed product on film so a more in depth observation can be made at a later time (Bailey, 1977). Pictures of a task can be taken at various points along the way, so that a record is kept of the learner's progress. Also, teachers could videotape a play session or role-playing activity and later analyze student behaviors. Research has been conducted on the use of videotaping for instructional purposes; however, the use of this technology for observational purposes and to assist teachers in task analysis merits further study.

DIRECT OBSERVATIONAL RECORDING OF BEHAVIORS

Many learner behaviors do not result in the completion of a permanent product and require different measurement systems. These behaviors involve what Sulzer-Azaroff and Mayer (1977) termed *transitory events*; that is, behaviors that must be observed under natural environmental circumstances to make it possible to count or time whether the behavior occurred or did not occur. For example, behaviors in this category that are often exhibited by retarded learners include headbanging, rocking, name calling, sound utterances, out-of-seat behavior, off-task behavior, compliance, smiling, and initiating conversations. Measuring these and other behaviors requires the use of live observers. In any case, transitory behaviors do not result in permanent products by students but rather in behaviors that can be categorized as either discrete or transient.

Measuring Discrete Behaviors

Discrete behaviors have a clear and distinct beginning and end (onset and offset). Teachers of retarded learners who use task analyzed curricular components have in fact identified discrete behaviors. Therefore, when teachers define a behavior operationally, it can be termed discrete if there is no doubt when the behavior started and when it stopped. If a mildly retarded student asks a question, this can be considered a discrete behavior. Conversely, if a severely retarded learner babbles a number of undistinguishable sounds, so that identifying a clear onset and offset is not possible, it cannot be classified as a discrete behavior.

Two methods can be used to measure discrete behaviors: event recording and duration recording (Alberto & Troutman, 1983; Bailey, 1977; Cooper, 1981; Sulzer-Azaroff & Mayer, 1977). Event recording involves a count or tally of the number of times that a specific behavior occurs within a designated period of time. The teacher can choose either frequency, rate, or percentages to use with event recording. For example, a teacher may record the number of words that a severely retarded student can repeat in 10 minutes (frequency), or convert the system to record rate simply by dividing the total number of words said correctly by the total time. The percentage of words said correctly by the student can be determined by dividing the number of correct responses by the total number of words presented. The choice of whether to use frequency, rate or percentage depends on the task to be taught; some tasks lend themselves better to one type of measurement technique than either of the others.

There are a number of event recording techniques teachers can use to obtain accurate data. Probably the most efficient and unobtrusive technique is to use a wrist golf counter. Teachers (or other observers) can keep this device with them at all times, keeping their hands free to engage in other activities. Additional devices or techniques for collecting event data might include transferring pennies from one pocket to another, making tallies with a pencil on a recording sheet, and the like. It is up to the teacher to choose the most appropriate techniques given the target behaviors.

The second method for recording discrete behaviors involves taking a measure of duration (length of time). This method allows the teacher to time the length of a specific behavior with the goal of either decreasing or increasing the length of time that the behavior occurs. For behaviors where approximate measures will suffice (e.g., length of time to complete an assignment), teachers can use a wrist-watch or wall clock. However, if a duration measure is to be accurate, a precise definition of the discrete behavior must be available, and for this there is no substitute for a stopwatch. Teachers of mentally retarded learners will find that both a stopwatch and wrist counter are vital tools for monitoring and changing the behaviors of their students. Figure 5.5 shows examples of two types of recording sheets that teachers can use for recording discrete behaviors.

Event recording does not lend itself to recording behaviors that occur at high rates (e.g., certain self-injurious behaviors). Therefore, teachers should be able to develop observational systems to collect data that, when charted, will provide an accurate picture of those fleeting behaviors often exhibited by mentally retarded learners. Research in the field of applied behavior analysis has provided time

Student: KEVIN Observer: MR. PETE MOSS

Behavior: INTERRUPTING OTHERS DURING INDEPENDENT SEATWORK
ACTIVITIES (FREQUENCY)

Observation Times: DAILY 9AM-9:30 AM

3/26/84	3/27/84	3/28/84	3/29/84	3/30/84	4/1/84	4/2/84	4/3/84
HHH III	HHH I	HHH IIII	HHH	HHH I			

Student: JAMAL Observer: MR. PETE MOSS

Behavior: LENGTH OF TIME ENGAGED IN AN INDEPENDENT
LEISURE ACTIVITY (DURATION)

3/26/84	3/27/84	3/28/84	3/29/84	3/30/84	4/1/84	4/2/84	4/3/84
3 MIN. 10 SEC.	3 MIN.	4 MIN. 5 SEC.	3 MIN. 5 SEC.	5 MIN.			

■ FIGURE 5.5
Examples of Event Recording Sheets

sampling procedures that use intervals of time as the basic unit of measure for recording these fleeting behaviors.

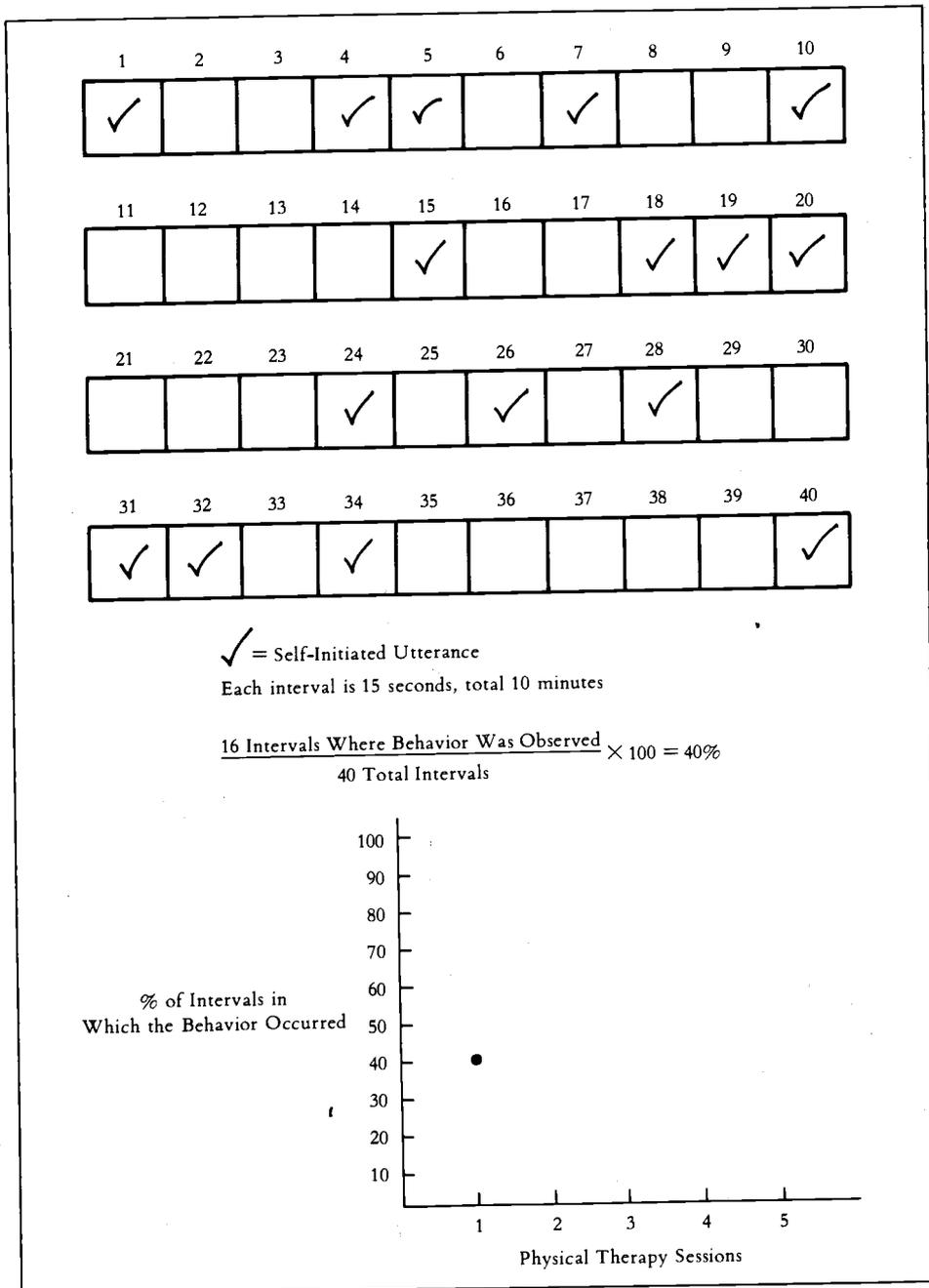
Measuring Transient Behaviors

Transient behaviors include movements exhibited by learners that occur at varying intensities and varying times of the day. These behaviors often do not have a predictable pattern associated with their occurrence or nonoccurrence. Behaviors such as sporadic temper tantrums, rocking, sudden utterances, and other types of fleeting movements that do not have a clear onset and offset require a recording system that can "capture" the essence of the behavior. Interval recording systems take a standard block of time such as a 20-minute reading lesson or a half-hour physical therapy session and break down the total time into smaller discrete time intervals. This allows teachers to analyze the components or patterns that are being exhibited by learners and attempt to alter the patterns of behavior (Cooper, 1981).

Continuous Observation Systems

Bailey (1977) has classified interval recording systems into two categories. The first category includes techniques known as *continuous observation*. These methods require that the teacher or other observers watch the learner continuously and record the specified aspects of the target behavior for the entire interval. For example, a teacher who is interested in increasing the self-initiated sounds that a profoundly retarded learner will make might choose to observe the student for 10 minutes during a physical therapy session. Since self-initiated utterances are fleeting behaviors, the teacher can break down the 10-minute period into forty, 15-second intervals. The teacher would then observe for the entire 10-minute session, recording some aspect of the behavior during each of the forty intervals (see Figure 5.6).

Partial Interval Recording. There are two different methods for developing continuous observation systems that are especially useful for classroom teachers. These methods have been discussed by many authors (e.g. Bailey, 1977; Cooper, 1981; Hall, 1971; Sulzer-Azaroff & Mayer, 1977). First, the *partial interval recording system* allows the observer to record a response if the response occurred during any portion of the interval. In the example just given, if the learner made a sound any time during the interval that interval would be scored (see Figure 5.6). This system allows the teacher to record a percentage of intervals during which the learner initiated sounds, thus providing an estimate of the current level of this behavior. Subsequently, the teacher might design a program to increase the number of utterances emitted, and this would be represented by an increase in the percentage of intervals in which sounds were uttered. The use of percentages results in a type of quality measure, allowing the teacher to judge if and when patterns of improvement occur.



■ FIGURE 5.6
 Partial Interval Recording System Plus Charted Data

Partial interval systems have a weakness that can be minimized with some preplanning. When behavior occurs at high rates (e.g., more than one talk-out per interval), the data recorded will not be representative of the actual number of behaviors if only the first occurrence is marked. Any additional occurrences are lost (not counted) until the following interval. The simplest solution to this problem is to shorten the length of the intervals. In many cases this modification will decrease the probability that more than one occurrence of the behavior will be exhibited during any interval. Rapidly occurring behaviors may require teachers to use an event recording system if a discrete definition of the movement can be developed.

Whole Interval Recording. A second method of continuous observation in an interval recording system involves observing whether or not the target behavior was emitted for the entire interval. This *whole interval recording system* allows the teacher to mark the interval only when the student engages in the behavior for the entire length of the interval. If the behavior ceases at any time during the interval, that block is not scored (see Figure 5.7). For example, the deteriorating work habits of a mildly retarded learner may have become a concern to her teachers. Karen may be demonstrating alarmingly long periods of time when she engages in some type of off-task behavior. After a behavioral definition has been established delineating what constitutes off-task behaviors, her teachers can set up an observation system using a whole interval approach. By totaling up the numbers of intervals that Karen has engaged in these behaviors and multiplying by the length of time of one interval, the teachers can obtain a conservative estimate of the length of time she stayed off-task.

Whole interval recording systems tend to produce conservative estimates of the behaviors they measure. Figure 5.7 demonstrates that parts of the behaviors actually occurred within intervals two, three, and five. Following the rules of using whole intervals, these segments cannot be recorded, and yet some behaviors did occur. This characteristic of whole interval systems is not necessarily a weakness; instead it can be considered a strength when certain behaviors are being recorded.

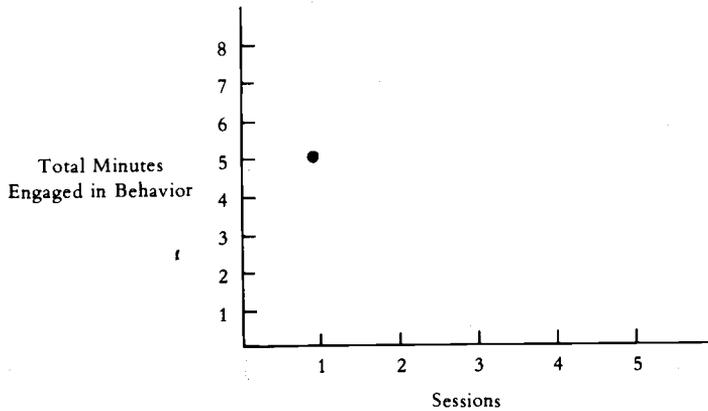
Sulzer-Azaroff and Mayer (1977) have pointed out that to select a valid measurement system professionals must match the characteristics of the system to the characteristics of given behaviors. Therefore, since whole interval systems tend to be more conservative (they underestimate) and partial interval systems tend to be more liberal (they overestimate), considering how they affect the recording of behaviors is important. For example, in Karen's case any eventual reduction in her off-task behavior would actually be less than what is presently occurring. It might be more efficient to redefine the behavior so that the amount of time Karen engages in on-task behavior is recorded. An observation of on-task behavior using the conservative method would estimate slightly less time engaged in the activities than was actually occurring. When attempting to increase these behaviors, a slightly conservative estimate will show more improvement than is actually being charted. One general rule of thumb would be to use more conservative methods when an increase in behavior is required and more liberal measures when a decrease is desired (Sulzer-Azaroff & Mayer, 1977).

1	2	3	4	5	6	7	8	9	10
✓					✓	✓	✓	✓	
11	12	13	14	15	16	17	18	19	20
		✓		✓	✓		✓	✓	✓
21	22	23	24	25	26	27	28	29	30
✓			✓	✓		✓	✓	✓	✓
31	32	33	34	35	36	37	38	39	40
							✓	✓	✓

✓ = Scored only when behavior occurs for the entire interval.
 Each interval is 15 seconds, total 10 minutes

21 Intervals Scored
 × 15 Seconds per Interval
 315 Seconds

5.15 Minutes
 $60 \overline{) 315}$
 300



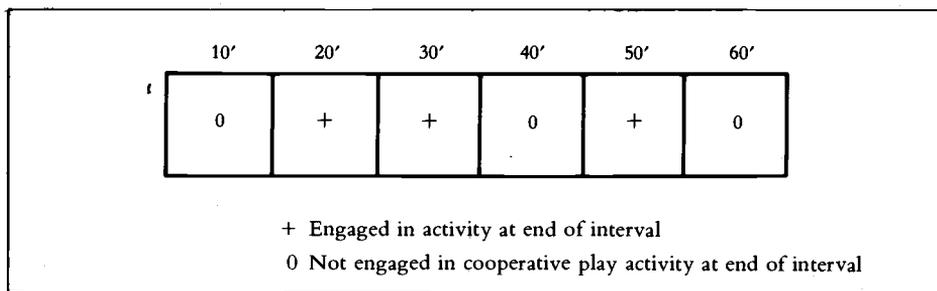
■ FIGURE 5.7
 Whole Interval Recording System Plus Charted Data

Momentary Time Sampling

There is a second interval recording system that can be useful to teachers. Momentary time sampling allows teachers to record the occurrence or nonoccurrence of target behaviors only at the end of prespecified time periods. As a result, teachers using momentary time sampling systems are free to participate in other activities while they are collecting data on a target behavior. For example, a teacher interested in obtaining a representative sample of how often a moderately retarded preschooler participates in cooperative activities with other children could use this approach (see Figure 5.8). The instructor may wish to observe the child during a free play period but not waste valuable teaching time by continuously observing the student.

The teacher could choose to break up the hour into twelve 5-minute intervals, observing the learner only at the end of each time period and recording whether or not a cooperative interaction is taking place at that time. This system allows the teacher to interact with other students without abandoning the applied behavior analysis program formulated for the target learner. With momentary time sampling systems, teachers can either use fixed time periods or observe learners at random intervals. In either case, if teachers are able to gather a sufficient number of data points (observations of the behavior), this system can be efficient and practical.

Inherent in all behavioral observation systems is a chance of error from recording more or less of the behavior than is actually occurring. Therefore, teachers should consider some type of system that checks whether or not observers are seeing what is intended. This system of checks, called *reliability of measurement*, is easy to use in classrooms. It will be discussed in the next section.



■ FIGURE 5.8
Momentary Time Sampling at 10-Minute Intervals



KEY CONCEPTS



- Permanent product evaluation is easy to use because obtaining these data does not interfere with the class schedule. Teachers can evaluate the products after the students complete the assignment.
 - By writing good objectives with clearly stated criteria, teachers can easily evaluate a completed product based on the preset criteria.
 - Frequency, rate, and percentages are three measures that can be used to evaluate permanent products.
 - By task analyzing the steps needed to complete permanent products (e.g., assemble a lawn mower carburetor), teachers can monitor students' progress toward the final objective.
 - Observational recording systems are used to measure behaviors that do not result in a permanent product.
 - Discrete behaviors are those with clear beginning and ending points (e.g., brushing teeth, catching a ball).
 - Event recording differs from permanent product evaluation only in the sense that discrete events occur and can be observed yet do not necessarily result in a lasting product (e.g., toothbrushing). Event recording can also use measures such as frequency, rate, and percentages.
 - Duration recording involves recording the length of time a student engages in a targeted behavior. Latency is similar to duration because it involves a length of time; however, this measure is used to record the length of time that elapses *before* a student engages in a behavior (e.g., length of time before students pick up their toys after a request by the teacher).
 - Transient behaviors are fleeting, leaving no predictable pattern for when they occur or for how long (e.g., some types of self-stimulatory behavior such as rocking or hand waving). Interval recording systems artificially break down larger blocks of time into discrete units in an effort to "capture" the fleeting response.
 - Partial interval recording systems are used to record a response if it occurs at any time during the interval. If there is a chance that the behavior will occur more than once during an interval, the length of the intervals should be shortened. Data resulting from a partial interval system can be graphed using frequency of intervals in which the behavior occurred or percentage of intervals in which the behavior occurred.
 - Whole interval recording systems are used to get a duration measure of a behavior. The teacher marks an interval only when the behavior occurred for the entire interval. A count of the number of scored intervals multiplied by the interval length results in the total time a student was engaged in a behavior.
 - Momentary time sampling allows the teacher to record behaviors if they occur at the end of an interval (e.g., whether Tommy is on-task at the end of each 5-minute interval). This system is less accurate than the others, but it does allow the teacher to sample behavior while engaged in other activities.
-

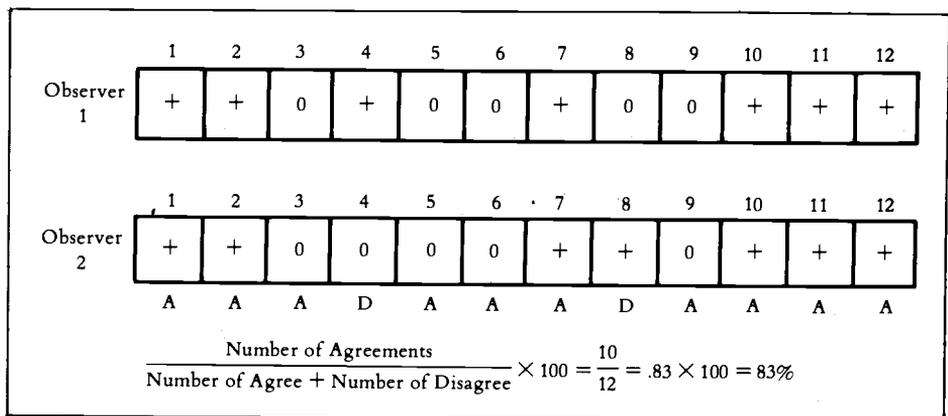
Reliability of Measurement

The best test of a measurement system's accuracy is whether or not it allows two or more people to simultaneously observe and consistently record the occurrences or nonoccurrences of the behavior. Interobserver reliability checks should produce a figure demonstrating that the observers agreed a minimum of 80% of the time.

A number of methods exist for establishing reliability among observers. However, for the purpose of most classroom teachers the point-by-point method or its variations appear to have the most utility. Interobserver agreement is reported in the form of percentage of agreement and disagreement among the various observers (see Figure 5.9). When the data gathered by two or more observers are compared using the simple formula given in Figure 5.9, the reliability percentage should be greater than 80% before the teacher can feel comfortable that the measurement system is accurate. Moreover, to increase the accuracy of the reliability estimate, it is important to compare each interval and note whether or not observer agreement occurred. This point-by-point method tends to be more conservative and accurate, lending additional support to the quality of the measurement system.

The importance of establishing good reliability estimates should be evident. If teachers fail to check the accuracy of their measurement systems, they can never be sure that they are obtaining an accurate count of learner behavior. Bailey (1977) has outlined a number of steps for enhancing the effective use of interrater reliability checks.

1. Observers must share the same vantage point.
2. Observers should not be able to view each other's scoring.
3. Observers must be using exactly the same interval.



■ FIGURE 5.9
Point-by-Point Reliability Formula

4. Observers should not communicate with each other.
5. Observers, if possible, should be unaware of checks. (pp. 111–116)

It may not always be possible to institute these procedures in classes for the retarded. However, being aware of the potential problems may limit the damage done to reliability estimates. For example, the first two steps can easily be handled using room dividers and other partitions located in many classrooms. The third step can easily be arranged by making a simple cassette tape that has been pretimed with a recorded voice stating “Interval one. . . , interval two. . . ,” and so forth. The observers can be hooked in to the tape recorder via inexpensive single-ear receivers and plug-in jacks. The fourth and fifth steps can usually be handled simply by the teacher’s monitoring of the situation.



IDEA FILE



One disadvantage inherent in the use of applied behavior analysis systems is the need for assistance when implementing such programs. A majority of behavioral programs should require only the efforts of the teacher, who can implement the intervention and quickly record the data. At times, however, programs become more complicated, especially when teachers are attempting to monitor and change transient behaviors of their students. The following suggestions may help teachers to design and implement more sophisticated programs.

- Teachers should locate and train a pool of volunteer observers who are available when needed. Parents, members of church groups, and members of community service groups can be good sources of these volunteers.
- Another source of potential observers is students enrolled in either high school or postsecondary vocational child care classes. Teachers of these classes often look for activities to increase their students’ contact with children.
- Teachers who have developed a good peer tutoring program also will have a ready pool of observers for recording data.
- Whenever possible, teachers should help students learn to record their own behaviors. This technique affords learners some measure of control over their lives and helps them to take more responsibility for their actions. Self-charting can also become a behavior modification procedure, helping students keep track of frequency, duration, or intensity of their behaviors.

Finding and Training Observers

No standardized procedures exist for training observers. As with all the components of applied behavior analysis, the foundation for training observers is the behavioral definitions and concise, operational definition of movements will make training observers easier.

Once the behaviors have been outlined and defined, the next step is to locate potential observers who are available during the times needed for observation, are interested in the class, and are reliable enough to meet with the teacher for training sessions (Bailey, 1977). Reliable, well-prepared observers are invaluable; however, there are times when even the most conscientious volunteers cannot attend a session. To avoid losing data, substitute observers should be available.

The length of training sessions varies from teacher to teacher. However, all sessions should allow ample time for practice. The mechanics of manipulating data sheets, tape recorders, and/or stopwatches while attempting to observe a learner can cause a loss of data. Initial sessions should allow observers to "get a feel" for the target behavior(s) either from the teacher's discussion and modeling of the behavior(s) or from viewing a videotape of the student exhibiting the movement(s). The latter technique is preferred in cases where the behavior is resistant to change and video equipment is available.

More than one observer may be necessary (especially when the teacher cannot act as a reliability checker), and it is best to train them at the same sessions. This allows for all observers to ask questions and discuss the behaviors simultaneously. Additional sessions allow for practice in coding the behaviors. Observers who are trained with video equipment should practice their skills in the natural setting at least once before the actual data collection sessions begin. Trial runs tend to iron out many problems that are unforeseen during training sessions.

Developing Data Recording Sheets

The efficiency of a data recording sheet is vital to both the teachers and any other observers gathering data. A cluttered, poorly designed sheet causes confusion and adversely affects the reliability of the measurement system. Therefore, a primary concern of the teacher is to design a recording sheet that will facilitate observation.

A coded sheet minimizes the amount of writing required of the observer, thus simplifying the system. Figure 5.10 demonstrates how it is much simpler to mark through a predetermined code than it is to remember the codes and write them down.

When an interval system is employed, the observation sheet would include boxes representing each interval. A simple check mark would be made in the box if the behavior was observed during that interval.

Bailey (1977) has suggested that an efficient observation sheet should contain three sections: (1) descriptive information; (2) observation boxes; and (3) a scoring and reliability summary of the data. The demographic data on the top of the sheet provide a reader with all information needed to understand when and how the data were gathered. This section is part of the teacher's management plan, allowing for the original data to be filed for later use.

Observational boxes were explained previously; however, equally important is the data scoring and reliability summary (Figure 5.10). This information minimizes confusion at later dates concerning who the reliability checker was or what the scores were for a particular day or session.

1 min		2		3		4		5		6	
OT	TO	OT	TO	OT	TO	OT	TO	OT	TO	OT	TO
P	T	P	T	P	T	P	T	P	T	P	T

7		8		9		10		11		12	
OT	TO										
P	T	P	T	P	T	P	T	P	T	P	T

OT - Off task
 TO - Talk-outs
 P - Poking others
 T - Throwing objects

■ FIGURE 5.10
 Example of a Coded Data Sheet Within Intervals

ESTABLISHING A BASELINE: ONE TOOL OF ASSESSMENT

Traditional assessment procedures attempt to measure a learner's present level of performance with standardized instruments such as diagnostic arithmetic or reading tests. The scores obtained from these tests establish a point of reference, allowing a comparison for later test samples. The information presented in Chapter Four suggested that these scores may not be sensitive enough to monitor the progress of retarded learners. The techniques of direct measurement, on the other hand, provide a way to visualize learner progress.

Establishing a baseline involves recording data that reflect student behaviors prior to the application of instructional techniques and materials or changes in the physical environment. These data can reflect permanent products (e.g., number of syllables pronounced correctly), discrete movements (e.g., getting out of a seat), or transient behaviors (e.g., rocking) and can all be charted to form a baseline.

Establishing a baseline of learning behavior is a vital component of the applied behavior analysis process; however, problems that can occur during baseline may adversely affect the gathering of a representative sample of learner behaviors. Professionals agree that it is best to gather repeated measures of a behavior over a period of several days or, in some cases, more than 1 week. Data that have been charted provide teachers with the best indication of when a truly representative sample has been obtained. For example, a teacher interested in

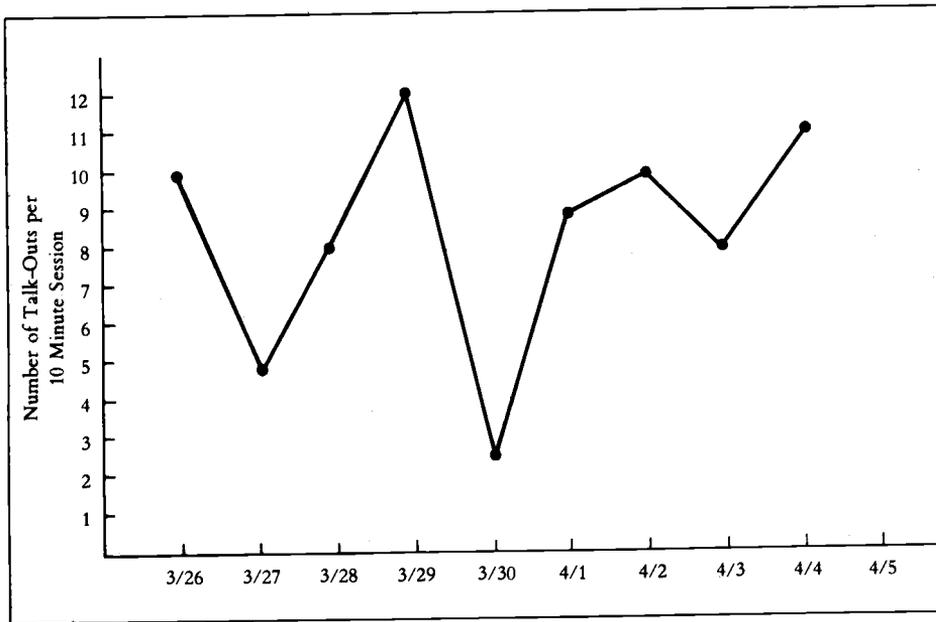


The techniques of direct measurement provide a way to visualize the learning process. (Courtesy of Clarke County Public Schools, Georgia)

modifying Kathy's sudden talk-outs during workshop exercises may find that these behaviors had alternately high and low rates of emission. In this case, it would probably be wise to continue baseline observation longer. Figure 5.11 presents a chart of Kathy's baseline for talk-outs. Note that during the first week (sessions 1–5), the number of talk-outs recorded was unstable. In this instance, the teacher was wise to extend the baseline over the next 4 days in order to obtain a clearer representation of Kathy's behavior. Of course, not all the behaviors exhibited by retarded learners will stabilize over time. When they do not stabilize, teachers can take an average of the behaviors and use that as a point of reference for possible changes occurring after intervention (see Figure 5.11).

Charting Student Progress

One goal for teachers of retarded learners should be to make instructional techniques more effective. Accomplishing this goal will require teachers to carefully



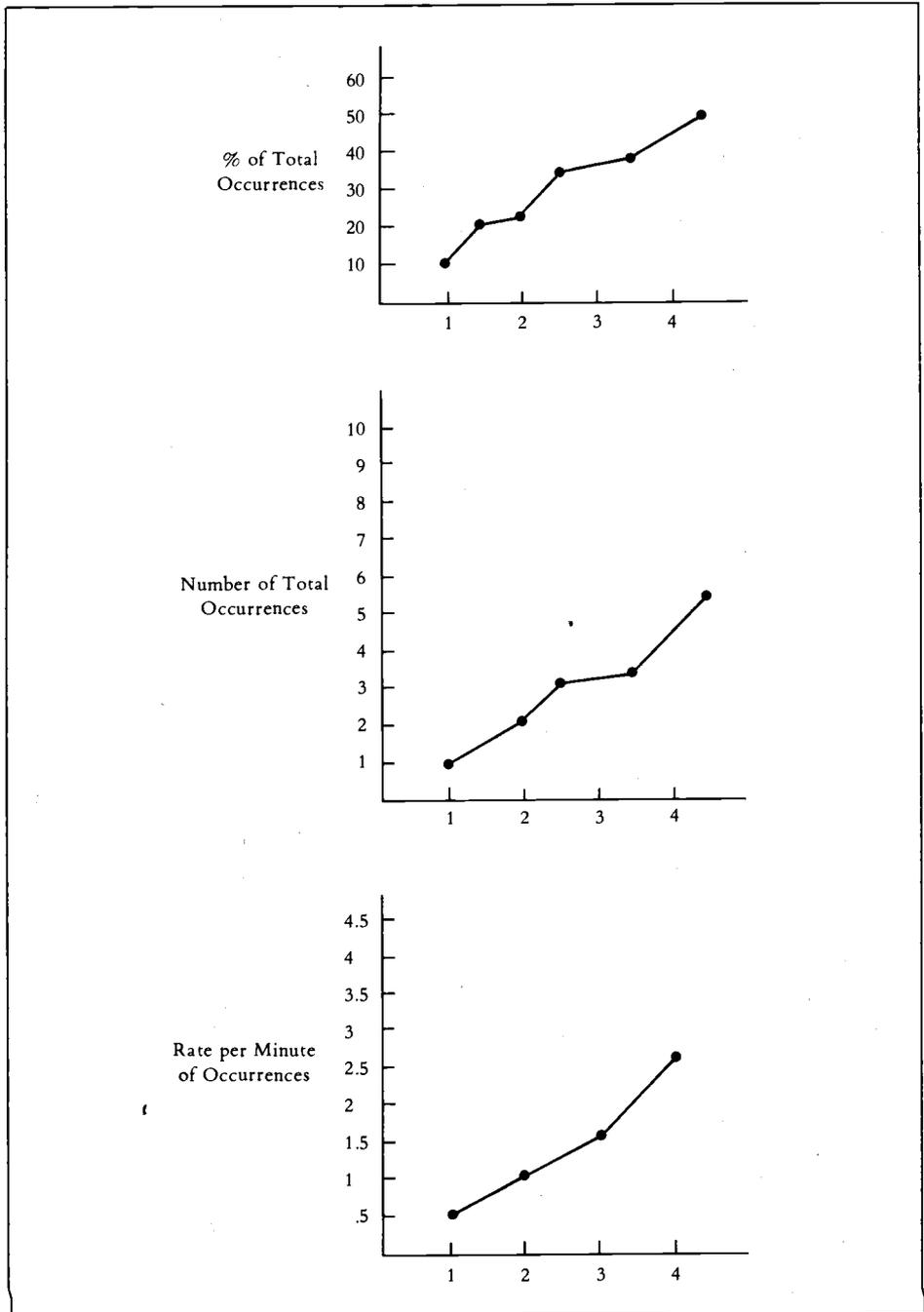
■ FIGURE 5.11
Chart of Kathy's Talk-Outs—Baseline

monitor student progress and relate any progress to the intervention. This functional relationship between what the teacher does (e.g., use of behavioral procedures, materials, or media) and subsequent student behavior was discussed earlier. A key point, however, is that student behavior should occur as planned or it will be necessary to alter the behavioral procedures.

The methods used to measure student progress should be designed to monitor the behaviors of individuals. Often data will be more useful if they are converted into graphic forms that allow teachers to see the patterns of behaviors as they occur. The old saying that "one picture is worth a thousand words" has definite implications for charting the behaviors of retarded learners.

Line Graphs

Line graphs are drawn using two axes on graph paper, with the horizontal axis (abscissa or x -axis) representing the times the behavior occurred and the vertical axis (ordinate or y -axis) representing the amount of behavior that will be charted. Figure 5.12 provides examples of line graphs for monitoring behaviors. These graphs provide teachers with a method for frequent, easy-to-use checks of their students.



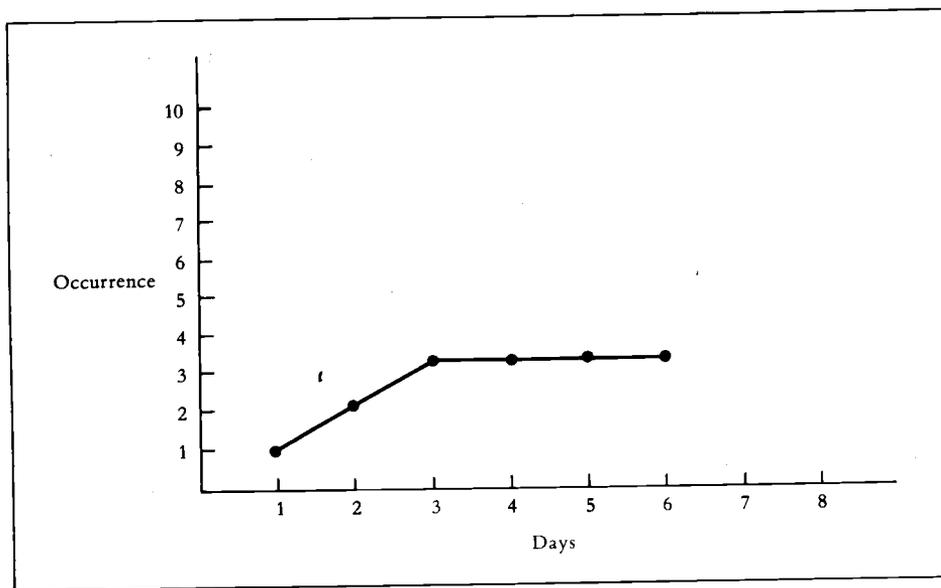
■ FIGURE 5.12
Basic Line Graphs

Cumulative Graphs

Cumulative graphs are an excellent way to monitor behaviors that occur at low rates by providing the user with a view of the upward trend of the response. To use a cumulative graph, the teacher adds the number of occurrences for the present session to those of the previous session.

For example, a resource teacher may wish to chart Maria's tardiness for class. Since Maria can only be late once each day, the use of a line graph would not be helpful because it would not demonstrate a pattern (e.g., a line fluctuation between zero and one occurrence). A cumulative graph, on the other hand, will allow the teacher to establish a pattern of Maria's behavior (see Figure 5.13). The teacher defined the target behavior as crossing the door's threshold after the class bell has rung. On the first day Maria was late, and the teacher recorded this on the chart. Days two and three were also late days for Maria, requiring her teacher to add the first occurrence to the second (scoring a two for day two) and the third to the first two (scoring a three for day three). For days four and five, however, Maria was on time. This required the teacher to add zeros (representing no occurrences of late behavior) to day three.

The cumulative graph is a helpful tool for teachers because it allows them to monitor the patterns of behaviors occurring at low rates and pinpoint the exact times the behaviors occurred. In the example given, the teacher's goal will be to plot a straight line that will represent Maria's getting to class on time.



■ FIGURE 5.13
Cumulative Graph

Ratio Graphs

Ratio graphs are becoming more popular for charting behaviors occurring at high rates (e.g., handwaving) or where the numbers of possible occurrences from session to session vary sufficiently that charting percentages would not be useful. (e.g., Monday a student gets 18 out of 20 math problems correct, or 90%, and Tuesday he gets 48 out of 50 correct, or 96%—a difference of six percentage points when the student could have missed the same two problems.)

In these instances, teachers could choose to use ratio graphs, charting the rate per minute of their students' behaviors (Figure 5.14). These charts allow a great deal of variability, charting behaviors up to 1,000 per minute. A form of applied behavior analysis called *precision teaching* (White & Haring, 1980) uses ratio charts for improving academic skills, social behaviors, and any other response that can be converted into rate.

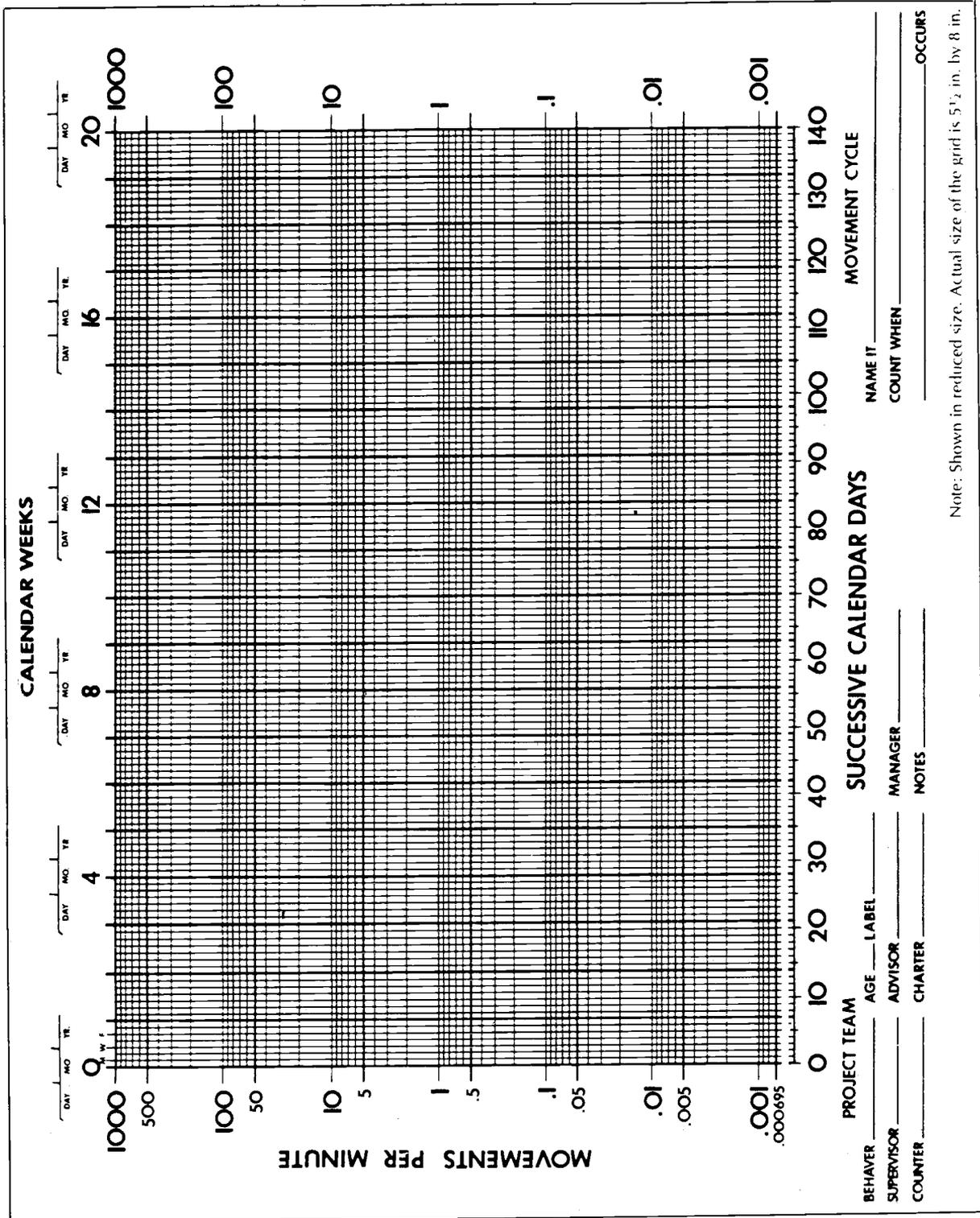
Single-Subject Designs

The charting methods used for establishing a cause-and-effect relationship between student behaviors and the interventions used by the teacher are called *single-subject designs*. The designs provide teachers with tools for judging the success of their teaching techniques and materials.

The first step in using single-subject designs is to gather *baseline* data. These data reflect the student's behavior *before* the teacher attempts to make any changes. Taking baseline data is important because the teacher will compare the student's behavior *after* the intervention has been applied. When single-subject designs are used appropriately to control other variables, any changes in the student's behavior might be attributed to the intervention.

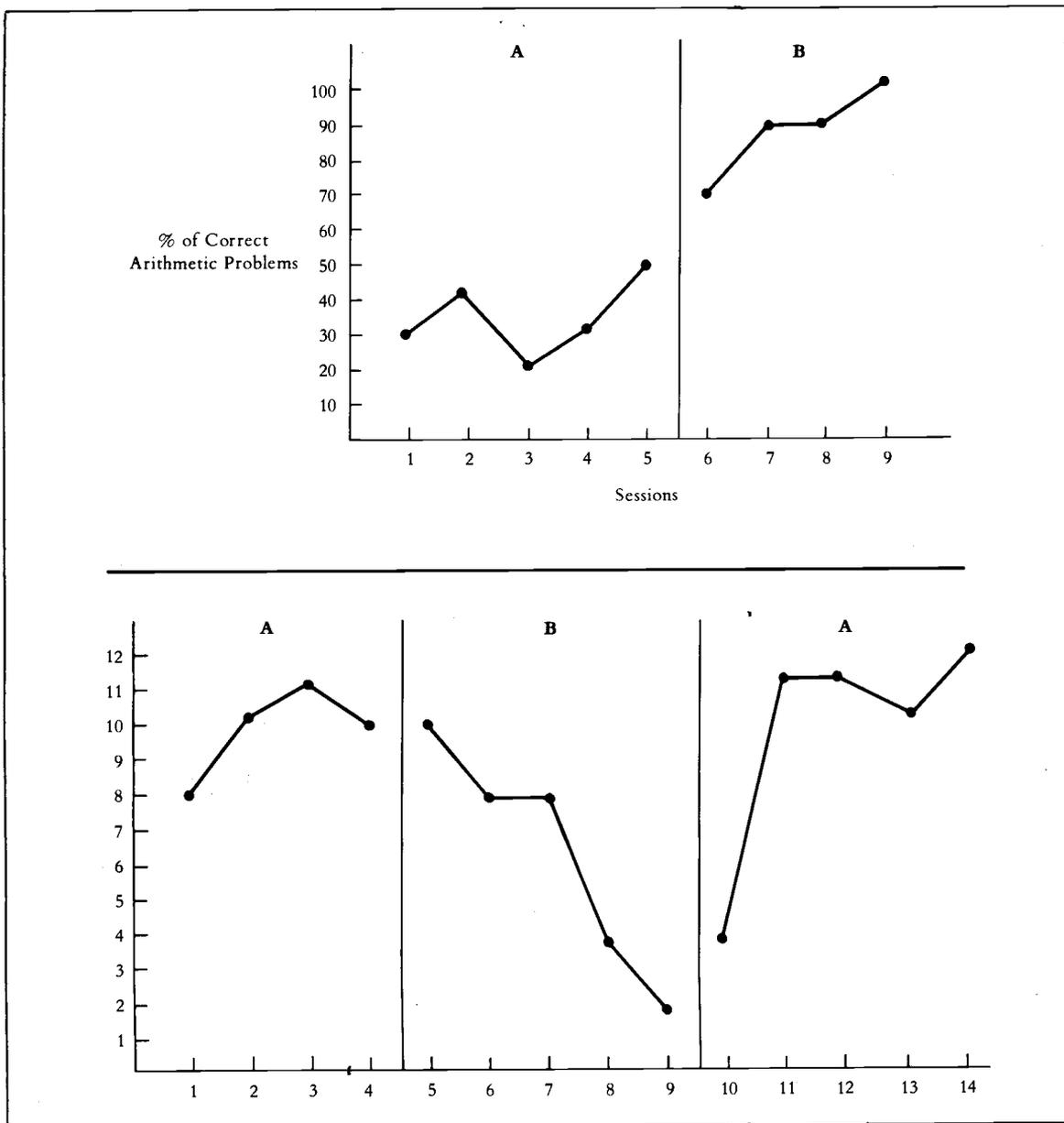
The most basic of the single-subject designs is the *A B design*. This design is easy to use because it only requires the teacher to collect data during two phases: the baseline and after the intervention. For example, Ramon has been having a great deal of trouble completing his arithmetic worksheets with any degree of success. After analyzing his errors, Ms. Barnstorm suspects that Ramon is not discriminating between the various operational signs (+, -, x, ÷). She first records his scores for five trials, and then after the fifth trial she begins to color code the signs on his worksheets (Figure 5.15). In this case, the intervention (color coding the signs on the worksheets) may have been a help to Ramon, since the data indicate a rapid improvement after the treatment phase began.

The *reversal design* is a technique used to assess the causal relationships between interventions and behaviors by following four steps: (1) taking baseline data; (2) applying the intervention; (3) returning to the baseline phase by removing the intervention; and (4) returning once again to the intervention phase (Figure 5.15). The control exerted by the reversal design is based on the belief that the intervention is controlling the behavior. Therefore, when the intervention is removed the behavior should return to its normal rate.



Note: Shown in reduced size. Actual size of the grid is 5 1/2 in. by 8 in.

FIGURE 5.14



■ FIGURE 5.15
Examples of A B and Reversal Designs

The example of the reversal design in Figure 5.15 shows the measurement of the effects of ignoring on the unproductive behaviors of a student. In this example the teacher counts the number of times that a student requests assistance from others. The teacher, who had previously stopped all her activity to help the student, now ignores each incident and praises the student for attempting the task before requiring assistance.

The numbers of requests dropped during the treatment phase, suggesting that the teacher's ignoring and praise technique was working. Further evidence that the treatment was effecting the decrease in the target behavior occurred when the teacher discontinued this intervention. When the intervention was not in place, the target behavior returned to higher levels, and it decreased again when the teacher began to ignore and praise.

Multiple-baseline designs are used to analyze the effects of an intervention on behaviors that are difficult to reverse. For example, if a student learns to add single-digit numbers because of a teacher's intervention, the removal of the intervention does not guarantee a reversal since the behavior has been learned. Therefore, most academic behaviors are not easily measured with reversal designs.

Multiple baselines have also been used to measure behaviors that it would be considered unethical to reverse. If a student's headbanging is controlled by using a pleasant stimulus such as light or sound, the procedure should not be reversed to prove that the treatment is effective, because the student might injure himself.

When using the multiple-baseline design, the teacher applies the intervention at different times across different settings, individuals, or target behaviors. The first example (Figure 5.16) demonstrates how a teacher uses a multiple-baseline across different settings. The resource teacher wishes to demonstrate that the use of chapter outlines developed by regular education peers might affect the test performance of a mainstreamed mildly handicapped student. Baseline data on the student's performance on semiweekly quizzes in science, social studies, and health education are taken by the regular educators for 2 weeks. Volunteer students in the science class then begin providing the target learner with chapter outlines the day before each quiz.

During this intervention the teacher continues to monitor the student's performance in social studies and health, where no outlines are used. After 2 weeks of using outlines in science, the teacher introduces them to the social studies class and then 2 weeks later to the health education class. As the baselines in Figure 5.16 indicate, the outlines appear to have assisted the student in improving his grades in all settings.

Multiple baselines have a great deal of utility because they can also measure the effects of interventions on more than one individual or on more than one behavior of the same individual. Figure 5.16 provides examples of each of these variations.

There are a number of other variations of the multiple-baseline design that are used primarily for research purposes. *Changing criterion designs* and *multi-element or alternating treatments designs* are examples of variations that may not be practical for classroom use because of the rigor required to control intervening variables. Teachers interested in measuring the effects of their teaching techniques generally can do so using either the reversal or multiple-baseline designs.

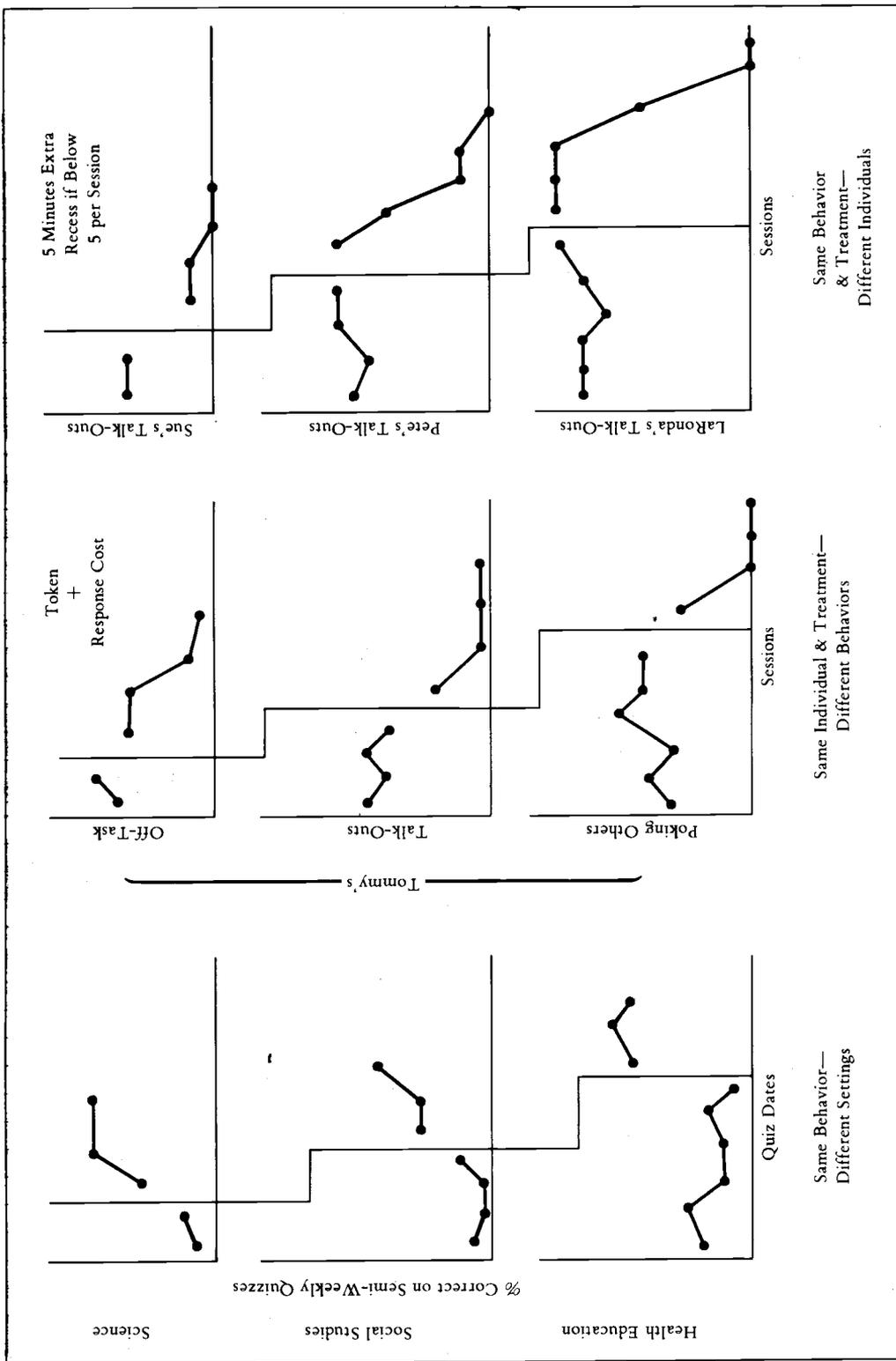


FIGURE 5.16
Examples of the Different Uses for Multiple-Baseline Designs



KEY CONCEPTS



A system of monitoring student performance is a vital component of ABA programs. This system usually results in charting student behaviors, making it easier to see slower learning rates and to discover problems with interventions.

- Line, cumulative, and ratio graphs do not allow teachers to establish a cause-and-effect relationship between their intervention and student behaviors. These graphs do, however, allow for a relatively simple way to monitor student progress.
- Single-subject designs are methods of charting that allow teachers to experimentally verify the cause-and-effect relationship between teaching strategies and student behaviors.
- A B designs are the easiest to use and the least rigorous in terms of experimental control. The "A" represents the baseline phase, where the teacher measures the target behaviors before any intervention occurs. The "B" represents the intervention phase, which is a measure of the target behavior after the intervention is applied. Any subsequent changes *might* be attributed to the intervention.
- Additional phases can be added to the A B design if the teacher wishes to try more than one intervention on the same behavior (e.g., A B C D E. . .).
- Reversal designs are more sophisticated than A B designs because they require a return to baseline, attempting to prove that without the intervention the target behavior will return to the previous levels. This design becomes more powerful as the number of reversals increases (e.g., A B A B. . .). Reversal designs cannot effectively measure acquired behaviors (e.g., academic skills) and should never be used to reverse behaviors where ethical questions are of concern (e.g., self-injurious behaviors, aggressive behaviors).
- Multiple-baseline designs have great potential for use in classrooms for retarded learners. They can be used to measure the effects of teaching strategies on a student's behaviors across different settings. These designs can also measure the effects of teaching strategies across more than one individual (e.g., token reinforcement on the student's completion of homework assignments). Finally, multiple baselines can be used to measure the effectiveness of a treatment across more than one behavior of an individual (e.g., ignoring and praise on Pam's out-of-seat, talking, and note-passing behaviors).
- Multiple baselines establish experimental control by successively applying the treatment at different intervals to different baselines.

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DEVELOPING INSTRUCTIONAL INTERVENTIONS, PART II: TECHNIQUES FOR CHANGING LEARNER BEHAVIORS

■ Teachers may fail to realize the utility of behavioral teaching strategies, and they also may fail to recognize exactly what they do in the teaching process. Some lesson plans describe in great detail what the student will do, but present no description of what the teacher does during the instructional process. Lovitt (1976) stated that a crucial element of applied behavior analysis (ABA) teaching programs is that all teaching procedures must be replicable. For example, a typical description of a teacher-learner situation might be that the teacher will present the learner with a discrimination task which, if successfully completed, will be reinforced. Unfortunately, this statement's lack of precision makes it impossible to understand or analyze what variables are occurring, which makes it impossible to judge the effectiveness of instruction. A replicable description might state that the teacher will model the discrimination task in conjunction with verbal directions, subsequently following the model with a graduated guidance procedure. Each time the learner correctly completes the task, a social reinforcer (e.g., smile) and a verbal reinforcer (e.g., "good job") are presented.

APPLYING BEHAVIORAL TEACHING STRATEGIES

Before the appropriate instructional procedure can be chosen, teachers must decide what effects they wish to have on student behaviors. To begin the process, it may be helpful to categorize the behaviors targeted for change. A simple procedure is to view behavior change in one of four ways: (1) increasing (accelerating) new or existing behaviors; (2) decreasing (decelerating) inappropriate behaviors; (3) maintaining existing behaviors; and (4) generalizing learned behaviors (Kysela & Hillyard, 1978; Snell & Smith, 1978; Sulzer-Azaroff & Mayer, 1977). All behaviors

of retarded learners should fall into one of these categories. Behavioral procedures (teaching strategies) are designed to change behavior in one of these four ways.

REINFORCEMENT

Technically, reinforcers are stimuli which, when applied as a consequence of a behavior, increase the probability that the behavior will reoccur. The principle of reinforcement is relatively easy to understand, and that may be one reason why it has been misused. When the principles of primary reinforcement became popular among educators, there was a rather abrupt increase in the use of sweets (candies) to modify the behavior of retarded learners. These sweets at times were administered in an unsystematic manner, and at times were not contingent upon the target behavior but rather a series of behaviors. As children began to “get wise” to the system, these sound behavioral principles became known as bribing and ultimately took on a negative image among some teachers—a situation analogous to blaming the hammer for pounding a nail in crooked.

At least a decade has passed since the push to use edible reinforcers, but some of these same problems may still be evident. Changes have occurred in the type of edibles that are used, but not in the quality of use. Recent visits by the author to some classes for young mildly retarded learners found that candy has given way to sweet cereal, or in more health-oriented programs apples and raisins. Although these changes may be appropriate, they will need to reflect a more systematic and precise use of the principles of reinforcement before desired changes in behaviors can occur.

A variation of the old saying that “one person’s bread is another person’s poison” can represent the basic foundation of reinforcement. Reinforcers that may be highly preferred by one learner may have little or no effect on others. Similarly, an event that may appear to be punishing to one person may, in fact, be reinforcing to others. These two examples illustrate where some teachers may have problems when using reinforcers with retarded learners. A first step for teachers is to incorporate techniques and/or observations designed to establish a hierarchy of reinforcers for each learner as part of their assessment strategies.



IDEA FILE



Many retarded students may have little experience with a wide variety of reinforcers. For example, a student who has never heard jazz music will not choose jazz records as reinforcers. Teachers can better assess a learner’s hierarchy of reinforcers by exposing the student to a wide variety of potentially pleasant experiences. This assessment technique is called *reinforcer sampling*. It can be implemented in two ways.

First, teachers can observe students engaging in normal daily activities. The activities, materials, and other individuals most frequently approached by each learner can be considered reinforcing.

A second technique is to structure situations where students can be exposed to different activities, materials, and individuals, noting which ones appear to be preferred (sometimes called a *reinforcer menu*). The reinforcers for each student are then ranked in terms of preference.

Finally, teachers can talk to the students, their parents, and siblings to establish other potential reinforcers.

Positive Versus Negative Reinforcers

Positive reinforcers are consequences that when paired with behaviors cause an increase in or strengthen the rate of response. If the behavior does not increase or maintain itself after a specific consequence has been applied, that consequence is not a positive reinforcer. Negative reinforcers also increase or maintain the behavior they are connected with; however, the difference is that negative reinforcers are aversive consequences which when *removed* from the situation cause the behavior to increase. Negative reinforcers are frequently used by teachers. When a teacher tells a student that she must complete her workbook activities before she can go with the rest of the class to recess, the teacher is using negative reinforcement. The aversive consequence of missing recess will be removed when the student completes her assignment. Some teachers use academic work as negative reinforcers, which may cause students to dislike their assignments.

Negative reinforcers resemble punishers only because they may stimulate adverse side effects in the student. In the example just cited, the danger is that the student will come to dislike workbook activities and attempt to avoid them. The misuse of negative reinforcers may be partially responsible for student dislike of academic tasks. Negative reinforcers are different from punishers in their effect on behaviors. Negative reinforcers tend to increase behaviors, whereas punishers tend to decrease behaviors. A reinforcer, then, serves to increase or maintain the level of a behavior.

Effective Use of Reinforcers: Relationship to Behaviors

Teachers can enhance the effectiveness of their positive reinforcement systems by precisely defining the behaviors they wish to reinforce. This step relates to the important principle of *immediacy of reinforcement*; that is, a poorly defined behavior makes it difficult to present the reinforcer immediately following that behavior. Moreover, an imprecisely defined behavior may result in the teacher's inadvertently reinforcing the wrong behavior.

For example, a teacher wishing to reinforce a severely retarded learner for "appropriate verbalizations" needs to define the kinds of verbalizations that are considered appropriate. Otherwise, utterances such as curses and screams may be reinforced by mistake. Similarly, if a behavior has not been defined in a manner identifying a clear beginning and ending, such as the completion of an assembly

task, the teacher may fail to immediately reinforce the behavior when it is completed.

Levels of Reinforcers

Positive reinforcers are enhanced when teachers match the most effective reinforcers to specific learners. Therefore, teachers should understand a reinforcer hierarchy (MacMillan, 1973; Snell & Smith, 1978) and how the levels of primary, secondary, and generalized reinforcers affect students.

Edible reinforcers are powerful tools for use with retarded learners if not abused or overused. The use of nutritious foods such as fruits and vegetables is desirable. However, teachers should be aware that satiation may occur if a specific food item is used too often. Overuse of reinforcers should be avoided at all costs. Edibles should be distributed in small quantities and should always be paired with a social reinforcer (e.g., a smile, a pat on the back). For instance, younger mildly and/or severely retarded learners may respond better to a small quantity of a reinforcer (one raisin or one piece of unsweetened cereal) paired with a *very* enthusiastic delivery ("Great job" or physical contact such as a pat on the arm).

Tangible reinforcers are the next level of the hierarchy. They include items such as toys, comic books, colored pencils, and free time. Teachers may look



Edible reinforcers should be distributed in small quantities and always paired with a social reinforcer such as a smile or a pat on the back. (Courtesy of Kay Shaw)

negatively upon tangible reinforcers because of excess cost or problems associated with presenting such reinforcers in conjunction with the behavior (Sulzer-Azaroff & Mayer, 1977). Tangible reinforcers do, however, improve the learning of some retarded learners and are generally most effective when used in conjunction with a token system.

Tangible reinforcers alone can be used effectively if two points are kept in mind. First, more complex behaviors merit more expensive rewards. In other words, you would not present a learner with a record album for completing one math assignment. Instead, the album may be contingent on a series of complex behaviors, such as using math skills appropriately in a number of community settings. Second, it may be wise to use tangible reinforcers that have many parts (Sulzer-Azaroff & Mayer, 1977). In this way, a student can earn, for example, a different crayon for each completed task, culminating in the presentation of a coloring book when the sequence of skills is combined to produce a completed task. This technique eliminates the possibility of "using up" potent reinforcers early and not having additional tangibles that are as effective for the remaining sequence.

The third step in a positive reinforcer hierarchy involves the use of token reinforcers. Token reinforcer systems are characterized by allowing students to earn points for specific behaviors that can be "cashed in" at a later time for various tangible reinforcers. In classrooms, group homes, workshops, or on-the-job placements, token economy systems can be an effective tool for changing the behaviors of retarded learners. Token systems may be the best available tool for teaching retarded learners to defer reinforcement. In many ways, these systems are effective methods of simulating work for pay situations.

The final step in a positive reinforcer hierarchy involves approval (praise) by significant others. Social reinforcers, such as smiles, verbal praise, a pat on the back, or a handshake are the types of reinforcers teachers should work students toward. The utility of social reinforcers lends strong support for their use because of their ease of application and the extent to which they are available in the natural setting. If the primary goal is to assist retarded learners to be as independent as possible, the use of social reinforcers becomes an important program component. Therefore, it is important to pair social reinforcers with each presentation of edible, tangible, or token reinforcers. The goal is to gradually fade the primary reinforcers and allow behaviors to come under the control of social reinforcers.

In general, it is best to use the highest level of reinforcer that works with a learner and move on to the next highest level as quickly as possible. For example, a teacher would not choose to use edibles with a moderately retarded learner if tangible reinforcers proved to be effective. Likewise, the teacher would attempt to move the learner promptly to the next higher level of a token economy. This effort moves the learner closer to more natural contingencies.

Additional Considerations for Using Positive Reinforcement

Maximizing the effects of reinforcers requires that students have a clear indication of the conditions for reinforcement. For example, if a student is to be reinforced

after completing a certain number of tasks or at a certain time of the day, the delivery of the reinforcers and the conditions must remain constant.

Deprivation of reinforcers is an important concept to consider when using edible reinforcers. Martin and Pear (1978) have defined deprivation as the time period that precedes any teaching in which the learner has not come in contact with the reinforcer. For example, presenting an edible reinforcer soon after a student's lunch period probably will minimize the strength of the reinforcer. Training sessions should be scheduled to allow a reasonable gap between when the student has eaten and when edibles are used as reinforcers.

Severe conditions of deprivation are unethical (Martin & Pear, 1978). Under *no* circumstances should teachers develop programs that incorporate intensive deprivation conditions, such as eliminating a student's breakfast and lunch so that edible reinforcers will be more powerful. Natural deprivation that is part of a student's daily schedule is a more appropriate option. For example, a teacher may wait until just before a learner leaves school to present instruction for which edibles are reinforcers. In this case, there has been a reasonable length of time since the lunch period, and the potency of the reinforcer is increased.

Using highly preferred activities to strengthen the response of nonpreferred ones is another form of reinforcement, known as the *Premack Principle*. Students often will engage in a behavior that otherwise has a low probability of occurring provided that they are then allowed to engage in behaviors that have a high probability of occurring (Premack, 1959). Parents and grandparents have for ages found this principle to be effective when they have told children, "Finish your chores and then you can go out and play."

Teachers can find many uses for the Premack Principle (e.g., "Finish your arithmetic and you can have extra recess time."). However, the failure to use this approach to reinforcement systematically can cause it to be less than effective. When using preferred activities it is important to establish firm conditions under which the behavior is to be reinforced and to use preferred activities sparingly.



KEY CONCEPTS



- A positive reinforcer is a stimulus that, when paired with a behavior as its consequence, either maintains the behavior at the current level or increases the probability that the behavior will reoccur.
- Positive reinforcers will be most effective when their presentation is *contingent* upon the production of the target behavior and is administered *immediately* following the behavior in question.
- Negative reinforcers *are not* punishers, because they tend to increase the behaviors they are paired with while behaviors paired with punishers tend to decrease. The key to understanding how negative reinforcers influence behavior is based on the concept of removal of an aversive stimulus or escape from one. If the teacher pairs the removal of an aversive stimulus with an increase in a desired behavior, a negative reinforcer has been used.

- Negative reinforcers should be used with caution since they can trigger aversive side-effects in some students. Some students become aggressive when presented with an either/or choice, and they can also learn to dislike the desired behavior if they perceive that it caused them to be subject to the aversive consequence.
 - Positive reinforcers that can be used with retarded learners fall into four categories: edible, tangible, token, and social reinforcers. Each of these can be powerful tools for behavior change if not abused or overused.
 - Students should have a clear indication of the conditions under which they will be reinforced.
 - Satiation results when a student is overexposed to a given reinforcer and its effect is severely weakened. This is especially true with edible reinforcers.
 - Deprivation or the space of time between meals can either strengthen or weaken the effects of edible reinforcers. For example, using edibles after lunch tends to weaken their effect.
 - The Premack Principle is a powerful tool for change. Highly preferred activities are used to strengthen the responses of less-preferred ones.
-

STIMULUS CONTROL: INCREASING NEW OR EXISTING BEHAVIORS

Antecedent stimuli are a set of events preceding behaviors that have a profound influence on the direction those behaviors will take. A stimulus (stimuli) is any one or a set of events, objects, or changes in the environment that results in a change in a learner's behavior (Miller, 1980). In an instructional setting, stimuli exist that may increase the probability that a student behavior will reoccur in the presence of those events, objects, or changes in the environment. For example, a teacher's saying to the class, "Let's get ready for lunch" increases the probability that activities will cease, materials will be returned to their places, and students will begin washing their hands.

Identifying and analyzing antecedent stimuli that trigger learner behaviors is a most important teacher responsibility. Teachers may fail to see the cause-and-effect relationships between what they do and how learners react, and the relationship between the behaviors of learners and their effects on other students can also be easily overlooked. This section presents strategies of stimulus control, that is, techniques for increasing the probability that a learner behavior will occur in the presence of certain stimuli and not in the presence of others. Stimulus control through a systematic arranging of antecedents is a technique for teaching retarded learners to discriminate among environmental events.

Discriminating Among Environmental Events

Historically, some professionals have felt that retarded individuals had a deficit in the ability to discriminate, that is, the ability to detect differences in objects, events,

and behaviors needed to respond appropriately in different situations. The use of systematic and precise instructional strategies for teaching appropriate discrimination skills appears to remediate some of these deficits (Westling & Koorland, 1979). For example, a nonretarded infant is apt to pick up subtle cues from its mother as she prompts the baby to babble—a behavior that brings immediate reinforcement. A retarded infant, because of some degree of sensory deprivation or other problems associated with retardation, may not pick up on these cues. Over time, reinforcers for the parents tend to decrease as the baby fails to generate responses, and this exacerbates the problem. Conversely, parents of retarded infants should *increase* their talking and babbling in order to help the infant to begin discriminating among sounds.

Differential Reinforcement

The procedure for teaching learners to exhibit certain behaviors in the presence of specific stimuli while inhibiting responses in the presence of others is called *differential reinforcement*. This strategy involves reinforcing a learner under certain conditions and not under others. For example, each time a student is about to enter the bathroom, the teacher points and says, "Mike, you're going to the men's room." If the teacher reinforces Mike when he enters the room, Mike should respond to the sign "Men," discriminating between the different bathrooms. The term for a stimulus occurring prior to a behavior that will be positively reinforced upon its occurrence is *discriminative stimulus* (S^D). For example, if a teacher wishes to have a mildly retarded learner change assignments, the teacher may press a low-frequency buzzer, reinforcing the learner only when the change is made. Over a number of trials the buzzer will become the S^D , increasing the probability that in its presence the learner will appropriately change assignments.

Two other ways to use differential reinforcement for stimulus control include choosing not to reinforce a learner's response when it occurs in the presence of a stimulus (S^A) or choosing to punish a response when it occurs in the presence of a stimulus (S^{D-}). Teaching learners to discriminate appropriately, then, involves either positively reinforcing, ignoring, or punishing behaviors when they occur in the presence of specific stimuli. Teaching retarded learners requires precision in identifying the stimuli important for control purposes and also in correctly reinforcing those stimuli once identified.

Teachers should consider a number of points before developing programs aimed at bringing behaviors under the control of environmental stimuli. First, the stimuli chosen by the teacher (e.g., verbal directions, events) must be clear and distinct. Stimuli can be adequately identified when teachers make a written list designating the conditions under which the behavior should occur as well as what conditions are inappropriate.

Students must know exactly what the S^D involves, along with the target response expected and the method of reinforcement. With mildly and moderately retarded learners, this communication can be enhanced by posting and referring to specific rules (Martin & Pear, 1978). The use of verbal directions by teachers must

be concise. Teachers may have a tendency to combine a number of verbal directions with no clear beginnings and endings to their requests (Langone, Koorland, & Oseroff, submitted for publication). For retarded learners who have auditory processing problems, such directions may increase confusion.

Teachers must find a way to clarify S^D s for severely and profoundly retarded learners who are initially unable to comprehend rules and verbal directions. Clarifying S^D s can be accomplished by developing distinct cues to catch the learner's attention. The teacher can also schedule several opportunities for the learner to come into contact with the designated stimulus. This allows the teacher to guide the behavior and subsequently reinforce it, structuring a number of pairings of the discriminative stimulus and behavior to allow additional reinforcement.

Choosing and appropriately applying the best reinforcement procedures for each learner is vital. Many severely and profoundly retarded learners do not respond to what are considered appropriate reinforcers, such as certain foods or social praise. As a result, teachers can become frustrated in their efforts to change behavior. In these instances, some nontraditional methods of reinforcement such as bright or colored lights, buzzers, vibrators, or fruit juices placed on the tongue in small doses can be highly effective.



CASE STUDY



" S^D , S^D , S^D , who does this nut from the university think we are, physics professors?" exclaimed Betty. "This inservice course was supposed to teach me to teach my EMR kids, and all she's doing is talking about discriminative something or other!"

"Now don't get all worked up; Betty. Dr. S. Control has some good ideas," said Gene. "Remember, the examples she used to teach academic skills were very good and made me realize that my behaviors have a tremendous influence on how the kids will react."

Betty asked, "Well, explain to me how all this mumbo jumbo is going to help me teach reading."

Shaking his head, Gene stated, "One example of an S^D is when you ask your kids to pick out the words you read them that begin with a certain sound. When students identify a correct word you reinforce them with social praise. That's an example of a discriminative stimulus that will increase the probability that they'll get the right answer when you read the words aloud."

"OK, I understand how that can be useful, but what's this S^A and S^D -stuff?"

" S^A s are easy to remember because you ignore a wrong answer, providing no reinforcer, and redirect the student toward the correct choice. S^D -s are used very infrequently because they involve punishing a response in the presence of a given stimulus. Dr. Control told us that punishers have many bad side-effects and may not be worth using."

Betty looked relieved. "When you explain it, I can understand how discrimi-

native stimuli can be more helpful if I use them more precisely and am careful whether or not I reinforce or ignore my kids' responses. Does that mean that everything I do affects how my kids will respond?"

"Just about," answered Gene. "Verbal instructions, models, prompts, written cues, and guidance are all considered discriminative stimuli."

"Now I understand," said Betty. "I can't wait until our next cocktail party, when I can impress my wise-guy science teacher neighbor with my new technical vocabulary! By carefully using S^D's I'll get him talking about what I want to talk about for a change."

"The idea, Betty, was to use S^D's to be a better teacher, remember?" asked Gene.

"Oh, yeah, that too!"

Implications for Teaching Retarded Learners

Stimulus control involves some action by the teacher that is either direct, such as a physical prompt, or indirect, such as a written cue. The goal of arranging antecedent stimuli is to increase the probability that the desired learner outcome will occur. First, teachers must be more aware of the quality of verbal directions that they use with learners since, with the constant action and interaction occurring within classrooms, verbal instructions can become confusing.



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- The teacher should get the student's attention before presenting the instruction. A rule of thumb would be to have the learner look at the teacher's face just prior to and during the verbal direction. (Langone, et al., submitted for publication).
- Verbal instructions should have a clear onset and offset. Also, in most cases one verbal direction should be presented at a time. When it is necessary to provide more than one instruction at a time, there should be a distinct pause between directions. (Langone, et al., submitted for publication).
- Verbal directions should be sequenced in the order in which the student is expected to perform them (Sulzer-Azaroff & Mayer, 1977).
- In many cases teachers should speak slowly, using sentences with appropriate vocabulary and simple word combinations (Snell & Smith, 1978).
- Teachers should determine whether or not the target response is in the learner's repertoire (Sulzer-Azaroff & Mayer, 1977) so that the instruction given is not beyond the student's present functioning level.
- Teachers should assess whether or not the verbal direction is, in fact, an effective discriminative stimulus (Sulzer-Azaroff & Mayer, 1977). Teachers may erroneously assume that instructions have been in the presence of a behavior long enough for the response to be adequately reinforced.

Verbal Directions

Verbal directions are the most sophisticated of stimulus control procedures. The ability to live independently requires that retarded individuals be able to appropriately respond to the verbal instructions and requests of others. Conversely, there might be times when a retarded person would be appropriately responding to a verbal instruction by not responding at all, for example, if a peer were to instruct him to shoplift. In either case, the ability to discriminate and act on verbal directions is an important competency for learners. Nevertheless, many moderately, severely, and profoundly retarded learners have inadequate or no skills for being able to follow verbal directions alone (Dunlap, Koegel, & Burke, 1981). Consequently, teachers must initially pair verbal directions with other techniques of stimulus control, eventually getting the learner to respond to verbal instructions alone or, in most cases, to environmental stimuli that trigger the need for them to perform certain behaviors (Richman, Reiss, Bauman, & Bailey, 1984).

Modeling

Modeling is an important teaching tool. Unfortunately, many retarded individuals demonstrate a severe deficiency in their ability to model the behaviors of others (Whitman & Scibak, 1979), and teachers do not appear to use modeling techniques to their fullest advantage (Langone, et al., submitted for publication). The result may be the loss of a valuable teaching technique.

Modeling involves demonstrating a sequence of skills as a complete set or simply demonstrating isolated steps in a sequence. The learner watches the demonstration and is then required to imitate the desired responses.



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- Teachers should always get the student's attention prior to each step in the modeling procedure (e.g., Neef, Walters, & Egel, 1984). One suggestion is to direct the learner's view toward the task being modeled (e.g., hands in an assembly task) (Langone, et al., submitted for publication).
- Teachers should combine clear, concise verbal directions with the modeling procedure (Langone, et al., submitted for publication).
- A model must be carefully chosen. Learners tend to model more readily the behaviors of others who have characteristics similar to their own, and they will also model the behaviors of others they deem prestigious. Therefore, teachers should point out the similar characteristics of the model and use class leaders as models in a peer tutoring process (Sulzer-Azaroff & Mayer, 1977).
- Teachers should keep the modeling process as simple as possible. If an instructional analysis has been properly designed, the teacher follows the sequential steps from the easier to the more difficult (Martin & Pear, 1978).

- Teachers can use effective reinforcement procedures to reinforce correct modeling behaviors of learners. Learners tend to imitate more readily when the models have been reinforced for their behavior (Sulzer-Azaroff & Mayer, 1977).
- Teachers should choose models who are familiar to the learner and allow the models to demonstrate competence in the behaviors they are to demonstrate. (Sulzer-Azaroff & Mayer, 1977).
- Teachers should always model the behaviors from the same direction that the learner is required to perform the task. This minimizes any left to right confusion (Langone, et al., submitted for publication).

A variation on modeling procedures that is very effective in teaching pre-vocational skills to retarded learners is called *match-to-sample modeling*. This technique involves teaching the learner to follow a completed task matching the steps to a completed duplicate sample. For example, when students are being taught to complete a circuit board assembly, using a completed unit as a sample helps by serving as a reference to the pattern.

Teaching Imitative Skills

Many severely and profoundly retarded learners lack the basic skill of imitating. Therefore, teaching imitative skills becomes paramount before modeling can be effective. Researchers have developed some effective procedures for teaching imitative behaviors in this population (Butz & Hasazi, 1973; Streifel & Phelan, 1972). These procedures include physical prompts, guidance, and various shaping techniques.

Physical Prompts and Cues. Physically prompting a learner by using gestures or building written cues into instructional materials is a technique of stimulus control. For example, a teacher may *point* to an object and request that the student pick it up. Similarly, when teaching reading comprehension skills a teacher may underline key words in a paragraph in order to cue the student to the main ideas of the passage. In each case, the teacher systematically attempts to direct the learner's attention to some relevant stimulus of the task.



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- Teachers should always use a clear verbal direction with each prompt and cue, following the rules for verbal directions stated earlier in this chapter (Langone, et al., submitted for publication).
- When using cues embedded in activities and materials, teachers should make sure the cue is distinct enough in color, shape, or size to direct the learner's attention to the key aspects of the stimulus (Westling & Koorland, 1979).

- Teachers should order prompts and cues in a hierarchy from the most natural to the most artificial (Sulzer-Azaroff & Mayer, 1977). For example, when requiring a learner to discriminate between two different colors of transistors, the most natural prompt may be to point in the direction of the desired color. The most artificial prompt, then, may be to push the desired transistor closer to the student, facilitating the choice of that object.
- Teachers should not overuse any prompt or cue that encourages the learner to become overly dependent on it (Sulzer-Azaroff & Mayer, 1977). A general rule of thumb is to fade the prompt or cue as soon as possible.
- Teachers can use a combination of prompts and cues as required by student needs, carefully fading one element of the combination at a time (Fisher & Zeaman, 1973). Initial teaching of a skill may require the use of two or more artificial prompts and cues, for example, pointing as well as increasing the size and changing the color of the stimulus. However, when fading the cues, the teacher should gradually fade one cue, then another, and so on.

Using physical prompts and cues as teaching procedures can be highly effective when applied systematically. Gold (1972), in his now famous bicycle brake study, demonstrated the effectiveness of using color cues in teaching a complex assembly task to severely retarded learners. Similarly, Lovitt (1978, 1984) has demonstrated in a number of research projects the utility of prompts and cues in teaching academic skills to handicapped individuals.

Physical Guidance. The concept of antecedent events is concerned with using a teaching procedure that ensures learner success. Physical guidance involves carefully "guiding" the learner through the desired task by shadowing the student's movements. For instance, golf pros often shadow a beginner's movements by standing behind the student, placing their hands over the student's grip on the club, and guiding the student through the swing. Likewise, when teaching a psychomotor skill to a retarded learner, the teacher can guide the learner through the task by manipulating the learner's hands, arms, or legs. Physical guidance can be subdivided by degrees. The first degree, called *graduated guidance*, involves partially guiding a learner through a task. The second degree, *total guidance*, involves completing the entire task while manipulating the learner's movements (Foxx & Azrin, 1973). Total guidance is designed to ensure the success of the learner by guiding the learner through the entire task. For example, when teaching a profoundly retarded learner to hold up his or her head, a teacher would manually assist the learner's head to the desired position while presenting the verbal stimulus, "Hold up your head." This procedure allows for immediate and frequent reinforcement because the student completes the desired task on each trial.

The second degree of guidance gradually directs the learner through the task using varying amounts of hand pressure (Foxx & Azrin, 1973). Graduated guidance may in some cases have more utility for teachers than a total guidance procedure. This technique uses only the amount of force necessary to direct the

student toward the desired goals. That is, if a learner resists a teacher's direction, the teacher should only use enough force to counteract the opposition. The amount of force used to begin the student's movement will be minimal, increasing only as the need arises (Foxy & Azrin, 1973). For example, when teaching cursive writing to mildly retarded students, the teacher may assist them by gently touching their writing hands in the direction that the pen should go to complete the letters.



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Whether a teacher decides to use total or graduated guidance is dependent upon the needs of the learner.

- If a learner is very passive (e.g., limp hands), or if a learner simply resists a teacher's efforts at total guidance, the teacher should use the graduated technique (Foxy & Azrin, 1973).
- Teachers should develop a teaching setting that is relaxed and comfortable, thereby increasing the probability that the learner will only minimally resist teacher direction (Sulzer-Azaroff & Mayer, 1977).
- Teachers should use clear, simple verbal directions with each attempt at guidance (Langone, et al., submitted for publication).
- Teachers should fade guidance to a touch or shadow the learner's movement from a short distance away as soon as possible (Foxy & Azrin, 1973).
- When fading the guidance, teachers should use a smaller degree of the original procedure, such as touching the wrist, the elbow, and finally the back (Snell & Smith, 1978).

One technique of presenting the antecedent events (teacher behaviors) is to do so in hierarchical fashion. The hierarchy generally proceeds from giving the most sophisticated S^D of verbal directions to modeling, then physical prompts/cues, and ending with the lowest level of guidance. PROJECT MORE, developed at the University of Kansas, sequences teacher behaviors in this hierarchy and suggests that teachers follow this pattern when teaching skills to retarded learners (Lent & McLean, 1976). The important point is that the level of antecedent teacher behavior used is dependent on learner needs. Information gathered during the assessment process (see Chapter Four) should help the teacher decide the level of S^D that a student comprehends. The teacher begins the instructional presentation to the learner by gradually fading each of the lower levels until the student can function under modeling and eventually with only verbal directions.



KEY CONCEPTS



- Increasing the probability that behaviors will occur and reoccur can be accomplished more efficiently by pairing some form of antecedent stimulus with a consequence

following the behavior. Essentially, the teacher provides learners with some type of prompt or cue designed to stimulate the desired responses. If the desired behavior occurs, the teacher positively reinforces it, increasing the probability that it will reoccur when the original prompt or cue is given.

- Teachers can choose to positively reinforce, ignore, or punish behaviors that occur after antecedent events. Once these events begin to have control over the behaviors, they become *discriminative stimuli* (S^D).
- Using S^D s is a method of helping students discriminate between conditions when behaviors may be appropriate or inappropriate. For example, ringing a bell in the classroom may signify that it is time to actively engage in a noisy game.
- The most common S^D s used by teachers are verbal instructions, modeling, physical prompts, visual or auditory cues, and physical guidance.
- All teachers use S^D s. The skill is in using S^D s consistently and precisely across different situations. For example, if a teacher asks a student to complete his math assignment—sometimes punishing him for failure to do so and sometimes ignoring him when assignments are unfinished—she sends mixed signals to the student. It then may become a game, with the learner trying to see if he can “get away with it” when she asks him to do his work.
- Fading is an important concept that involves the *gradual* removal of less desirable prompts so that behaviors will eventually come under the control of more natural S^D s (e.g., verbal instructions).

Developing New Responses: Shaping and Chaining

Shaping is a strategy designed to develop behaviors not currently in a student's repertoire of responses. The teacher first identifies some response related to the target behavior. The next step is to reinforce any changes in behavior (no matter how minor) until those changes begin to resemble the desired outcome. For instance, Michael, who is physically able to walk, does not do so independently when he needs to go to the bathroom. His gaze in the direction of the bathroom may be the first response to reinforce. Each time Michael moves in the direction of the bathroom he will also be reinforced. The teacher selectively reinforces movements that get closer to the target (*successive approximations*) while discontinuing reinforcement of those approximations when they no longer are useful (*extinction*). The result is a procedure that can be used successfully to develop new academic, language, social, self-care, and vocational behaviors in retarded learners.

Mildly retarded learners may have a great deal of trouble dealing with large numbers of stimuli presented at one time. Students who are mainstreamed into regular classes for academic subjects often find it difficult to complete assignments involving many parts (e.g., 25 arithmetic problems or 15 reading comprehension questions). Shaping can be a useful technique for helping students to gradually be able to complete larger units of work.

For example, out of 25 arithmetic problems, Cassius generally can only complete about five. His teacher will reinforce him for any improvement over five and continue to reinforce him only for improvements over the preceding level.



CASE STUDY



Bill was a high-school-age mildly retarded student who spent two periods a day in a resource room and the remainder of the day in mainstreamed regular as well as vocational education classes. Mr. Hansom, the resource teacher, discovered that Bill was having a particular problem in his consumer education class in keeping up with the class assignments and grasping the material.

Mr. Hansom approached Ms. Adams to ask her about the problem. "I just don't know what to do Mr. Hansom. Bill tries hard but he can't see the total picture of anything I teach. For example, just yesterday I taught a lesson about the importance of choosing a place to live based on individual and family needs, and when I assigned the homework Bill just looked at me with this blank look on his face!"

"Tell me more about the assignment," said Mr. Hansom.

"Well, I asked them to look in the "For Sale" and "Rental" sections of the newspaper and pick a place to live based on a net income of \$800 dollars a month for a family of four," answered Ms. Adams.

"I have an idea," claimed Mr. Hansom. "Why don't we develop *successive approximations!*"

"Please, Mr. Hansom, watch your language!"

"No, no, Ms. Adams, you misunderstand me. What I mean is that we can break down the large assignment for Bill and reward him for each step he completes toward the desired outcome."

Ms. Adams and Mr. Hansom worked out the following steps, each a successive approximation toward completion of the desired assignment.

- Bill will locate a home based on its accessibility to mass transit (because he doesn't have a car) and where his job is located.
- Bill will locate a home based on the number of bedrooms needed for him and his wife plus their two boys. He will also take into account the available storage space and size of yard.
- Bill will decide whether or not the school is close enough to their home so he or his wife can walk the boys to and pick them up from school.
- Bill will decide whether or not rental or mortgage costs are in line with their monthly budget based on the proportion of 25% of their total budget (using a calculator).
- Bill will judge whether or not any restrictions to tenants would be undesirable (e.g., no pets).

With this list of successive approximations in hand, Ms. Adams now reinforces Bill each time he completes a "mini-assignment." After he completes all the steps, she will give him another assignment that combines all the approximations at one time.

The procedure of backward chaining may be a more appropriate technique for teaching skills that require immediate completion and those that reinforce the learner when the last step in the chain is finished. Teaching retarded learners to dress is one example where the completion of the last step first allows students to see the completed task early in the teaching sequence. A second advantage for using the backward chaining procedure was demonstrated by Martin and Pear (1978) in an example of teaching a severely retarded girl to make her bed. The last step of the chain is to pull the bedspread over the pillow at the head of the bed. When the backward chaining procedure is applied, each step in the chain, when sufficiently reinforced, eventually becomes an S^D , serving as a cue to the next step.

Teachers have the option to use either forward, backward, or a combination of chaining procedures depending on the learner and the skill to be taught. When used inappropriately or in an unsystematic and inconsistent fashion, chaining can be a frustrating event for both teachers and students.



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- Field testing the task analysis with other people such as teachers, aides, general education students, and parents before applying it with retarded learners can improve the teaching sequence.
- Teachers should make sure the steps are taught in proper sequence so that each step in turn becomes a discriminative stimulus (Martin & Pear, 1978).
- Teachers should move slowly through the steps, being sure one step is thoroughly in place before moving on to the next step. (The criterion component of each instructional objective or step on a task analysis becomes the guide).
- Teachers should use clear, distinct verbal directions; models; prompts; and guidance when teaching each link of the chain (Sulzer-Azaroff & Mayer, 1977).
- As external prompts and cues become obsolete, teachers should fade them, leaving the natural S^D s that are inherent in the task.
- Teachers should be cognizant of areas where shaping can be incorporated into the teaching strategy. If there are links in the chain that are weak and not firmly in place in the student's repertoire, shaping will be helpful in strengthening those skills (Sulzer-Azaroff & Mayer, 1977).
- At any level of the chain, teachers should require the student to perform *all* the steps learned up to that point (Martin & Pear, 1978).
- Teachers should identify and use reinforcers that are effective with the target learner.

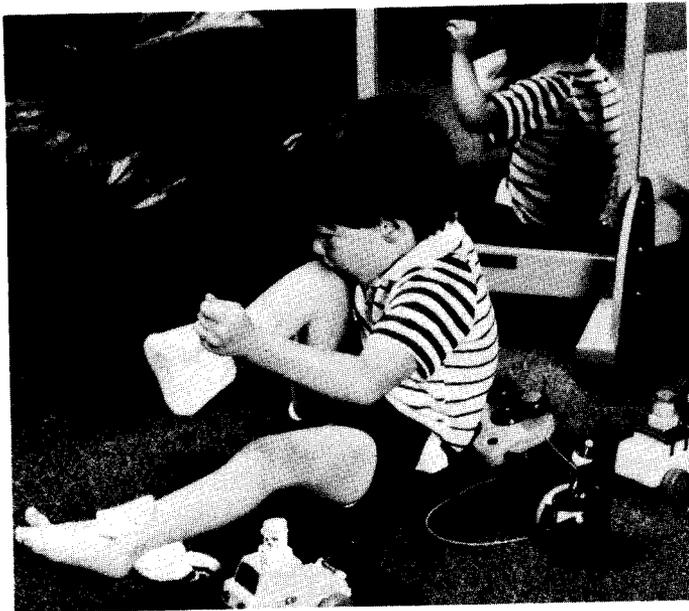
Increasing Behaviors: Token Economy Systems

Token economy systems, a form of reinforcers, are so complex in design and implementation that they can be easily misused and rendered ineffectual. How-

ever, the literature concerning token economies demonstrates a great many successes with these systems, supporting their *potential* value when they are designed carefully and implemented with a great deal of consistency.

Token economies are based on the same principles as our economic system; that is, we perform specified tasks for artificial incentives (money), and in turn we use money in exchange for our choice of goods and services. For educational purposes, tokens or points are earned by learners for exhibiting appropriate behaviors as negotiated between the teacher and students. The learners can then exchange these tokens or points for tangible reinforcers such as free time, preferred activities, and comic books. The effectiveness of token economies depends upon the learner's ability to understand a system of delayed gratification. A system of this nature can prove useful with many mildly and moderately retarded learners, but it may only be effective with some severely retarded students depending upon their ability to comprehend.

If token economies are scorned by some practitioners as being ineffective, it may be due to an unsystematic use of the technique. Research on token economies demonstrates that these systems have been quite effective in improving the academic skills (Bijou, Birnbrauer, Kidder, & Tague, 1967), prevocational task completion (Repp, Klett, Sosebee, & Speir, 1975), and self-help skills (Thomas, Sulzer-Azaroff, Lukeris, & Palmer, 1977) of retarded learners.



Research on token economics demonstrates that these systems have been quite effective in improving academic skills, prevocational task completion, and self-help skills. (Courtesy of DLM Teaching Resources, Allen, Texas)



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- Teachers should present tokens to learners immediately after the task has been completed (reinforce small steps at the beginning, gradually increasing the requirements necessary for earning tokens). However, teachers should set a minimal period that a learner has to wait before the tokens can be cashed in for the backup reinforcers.
- Backup reinforcers must be reinforcing to the students. Establishing a fair price list stating the cost in tokens for each reinforcer is a must. This price list should be in proportion to the actual cost of the items (Martin & Pear, 1978) or reflect the importance that the students place on the item (e.g., free time being a highly preferred activity).
- Once the price list has been set and the rules of immediate reinforcement developed, it is vitally important that teachers *be consistent* in the delivery of tokens and with the procedures for allowing tokens to be cashed in. Making exceptions to set rules will, more often than not, destroy the effectiveness of a token system.
- Teachers should be sure to obtain an accurate baseline of the target behaviors (Martin & Pear, 1978). Ongoing data are just as necessary as in any other behavioral program for establishing whether or not the token system is working.
- Teachers should keep an accurate, up-to-date recording system. Systems can become unmanageable if teachers lose track of who has how many tokens and who purchased what items. Data of this nature will be invaluable when revising the program.
- Teachers should identify people who can be of assistance in monitoring the program. Aides, parent volunteers, and regular education students, among others, can assist teachers in implementation, record keeping, and program management.
- Teachers should use tokens that cannot be counterfeited (Martin & Pear, 1978). In many instances, a points system that allows both the teacher and the student to keep a record of points earned may be more efficient for classroom purposes.

To be effective, token economies must be consistent and systematic. These programs are best implemented in an open atmosphere where administrators, parents, and significant others are kept abreast of occurrences and progress. Complicated token systems are generally devised for settings which encompass the learners' entire day such as residential or vocational settings; however, in many classrooms token systems can involve earning points for the completion of a specific activity (e.g., a math assignment). These points can be cashed in at a later time for preferred activities.

A technique that often works well in conjunction with token systems is called *contingency contracting*. Mildly retarded learners in particular react well to this approach, which spells out in contractual form what is expected of the student and what the teacher's role will be. After the teacher and the learner agree to the stipulations, they both sign the contract. This technique works well for some students and not for others. Yet, when used properly, it allows learners to take

responsibility for their actions and make decisions concerning the behaviors they wish to demonstrate. Teachers should always keep the original contract in a safe place, allowing the student to have a copy. At times, a learner who has not met the stipulations of the contract, and thus fails to receive the reinforcement, may destroy the document. After a "cooling off" period, the student may wish to reenter the agreement, which will necessitate only making a new copy of the document (Homme, 1969).

This section has provided teachers with suggestions for developing new behaviors or increasing existing ones. There are occasions, however, when teachers will need to apply techniques for decreasing the inappropriate behaviors of retarded learners. These techniques, designed to reduce the frequency and intensity of target behaviors, also require planning and systematic application. Inconsistent application of these techniques not only renders them ineffective but also has negative side-effects related to punishing contingencies. Therefore, it is crucial to develop programs that not only are effective for reducing inappropriate behaviors but also are consistent in their use.

DECREASING INAPPROPRIATE BEHAVIORS

Teachers should use a positive technique for behavior reduction first, applying aversive consequences only if the positive methods fail to have an effect (Barton, Brulle, & Repp, 1983). There are a number of positive methods that can be used to reduce behavior which are classified as techniques of *differential reinforcement* (Deitz & Repp, 1983; Martin & Pear, 1978; Sulzer-Azaroff & Mayer, 1977).

Differential Reinforcement Techniques

Differential reinforcement of low rates of behavior (DRL) allows the teacher to reinforce a learner who is emitting a behavior less than a predesignated amount during a certain time period. For example, while at a work station in vocational education, Ralph continually stops work to ask passers-by whether or not his work is "alright." In this case, the teacher may inform Ralph that if he only stops work to ask this question five times or fewer during a 1-3 hour session, he will be allowed to work on a preferred activity at the end of class. Ralph's teacher has decided that it would be best if Ralph seldom asked the target question; however, *for now* five times or fewer is an acceptable level.

In addition to the DRL technique, teachers have the option to apply a *differential reinforcement of other or zero behaviors* (DRO). This procedure involves reinforcing learners only after there are zero responses emitted during a specified time period. In Ralph's case, the teacher may decide that after he has decreased the number of the target responses, he is now ready to eliminate the behavior entirely. To accomplish this goal, the teacher would reinforce Ralph only if there were zero inappropriate questions asked during the 1-hour session.

A third technique for reducing behaviors using positive methods is called *differential reinforcement of incompatible behaviors* (DRI). Essentially, this procedure involves reinforcing a response that is incompatible with the target behavior. For example, a teacher could reinforce a severely retarded learner for picking up a ball, a response that competes with a self-stimulating behavior such as hand-waving.

A final technique is termed *differential reinforcement of alternative behaviors* (DRA). This procedure is similar to DRI except that the teacher reinforces behaviors that are substitutes for the target response. For example, a teacher might show a student how to work out with weights in the gym and reinforce the student for doing that instead of becoming overly anxious and engaging in destructive behaviors. Another example would be to reinforce mildly retarded students for writing letters of complaint to the teacher instead of talking back and cussing. The main thrust of the DRA procedure is to teach students more socially acceptable ways of dealing with stress.



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Differential reinforcement procedures generally take longer than aversive approaches to bring the target behaviors under control. However, the use of these procedures often leads to long-lasting effects because the students are learning new behaviors to compete with or supplant the undesirable ones.

- Differential reinforcement procedures can be used in conjunction with full sessions or intervals, depending on the frequency of the target behavior.
- Full sessions take a large block of time (e.g., 30 minutes), with the student being reinforced at the end of the session.
- Interval approaches take the session and divide it into equal parts (e.g., 30 minutes divided into 1-minute intervals) with students reinforced at the end of each interval.
- A full-session DRL (differential reinforcement of low rates of behavior) might be used for a less frequent behavior, reinforcing the student if he or she exhibits the behavior less than the preset criteria during the 30-minute session.
- An interval DRL can be used for behaviors that occur frequently, thus allowing the student more chances for reinforcement. For example, a student who leaves her seat about 30 to 50 times in 30 minutes would have little chance for reinforcement if the teacher targeted 20 incidences. However, if the teacher used 1-minute intervals and reinforced the student if she left her seat once or less, she might be able to keep the incidences at 30. The next step would be to lengthen the interval to 2 minutes, reinforcing her if she left her seat once or less during that interval.
- The lengths of intervals should not be set arbitrarily. Interval lengths should be set only after baseline data have been taken and analyzed. Teachers can choose interval lengths that best fit the student's needs and the characteristics of the target behavior.
- Full sessions and intervals can also be used with DRO procedures (differential reinforcement of other or zero behaviors).
- There have been a number of research efforts proving the effectiveness of differential reinforcement procedures, including the following applications:

- Controlling the activity level of retarded learners (Edelson & Sprague, 1974).
 - Reinforcing low rates of misbehavior (Dietz & Repp, 1973; 1974).
 - Training staff members (Repp & Dietz, 1979).
 - Reducing self-injurious behavior (Rose, 1979; Tarpley & Schroeder, 1979).
 - Reducing stereotypic behaviors (Harris & Wolchik, 1979).
 - Reducing inappropriate verbalizations using DRO (Konczak & Johnson, 1983).
-

Aversive Consequences

Unfortunately, positive approaches for decreasing inappropriate behaviors do not always work with different learners or at different times with the same learner. In cases such as these, teachers have the option to apply aversive consequences. Various punishers range in level of severity, and teachers should always use the least severe methods such as response cost, timeout, and overcorrection. The most severe of the aversive techniques (corporal punishment) results in too many negative side-effects and should be governed by an advisory committee of parents, administrators, and teachers (McDaniel, 1980; Rose, 1983). Aversive techniques such as electric shock are beyond the realm of the special education practitioner and are governed by human rights committees and other qualified professionals.

Response Cost

Response cost is the levying of fines on reinforcers, withdrawing specified amounts that are contingent upon certain offences (Walker, 1983). For example, if a student is fined 20 tokens for fighting, a response cost procedure has been applied. As with all behavioral procedures, a systematic application is needed if response cost is to be effective. When confronted with an inappropriate behavior that has not been previously targeted and explained to the learner, some teachers may be inclined to include it in the program. In this case, a teacher identifies a misbehavior and levies the fine before the student is informed of the response cost contingency. For a response cost system to be effective, the rules of the system must be clearly stated and understood by the learner in advance of its application and then consistently applied for each occurrence. Generally, response cost systems are used in conjunction with some form of a token economy.



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- Teachers should make sure learners have an adequate reinforcer reserve before implementing a response cost system. Fines are less effective when students have very little to lose.
- Whenever possible, teachers should allow learners to have input into developing the rules and fixing the fine lists in accordance with the severity of offences.

- Teachers should develop a rule poster with accompanying fines. Learners should demonstrate that they understand the rules and what the consequences are for breaking those rules (Sulzer-Azaroff & Mayer, 1977).
 - Teachers should not design systems in which learners can become too easily bankrupt. Building in opportunities for the learners to earn back some reinforcers for acts of restitution (e.g., picking up the blocks that were kicked across the room) makes a system more positive and fair.
 - Teachers may find it helpful to review some examples of response cost systems that have been used in research efforts, for example:
 - Modifying rule-violation, off-task, and academic behaviors (Iwata & Bailey, 1974).
 - Controlling unproductive behaviors of boys (Phillips, Phillips, Fixsen, & Wolf, 1971).
 - A group response cost system (Salend & Kovalich, 1981).
-

Problems will occur when response cost programs are implemented. Some students will refuse to hand over point cards or tokens when they are given their initial fines. A careful recording system can minimize this by demonstrating that the teacher's records are the accurate count of how many tokens a learner can spend. Response costs can themselves result in emotional outbursts or aggressive behaviors. Sulzer-Azaroff and Mayer (1977) have suggested downplaying this problem. Fines should be levied with little discussion and "fanfare," and when necessary the emotional outburst itself can be fined.

Timeout from Positive Reinforcement

Timeout procedures involve removing the student from the source of reinforcement or removing the source of reinforcement from the student. The mistake made by some teachers is to assume that their classes are reinforcing to students and that removing the students from class is a punishing consequence. In fact, some mildly retarded learners may prefer to be somewhere else if faced with activities that they perceive as having no relevance to their lives. Similarly, a severely retarded learner known to engage in self-stimulatory behaviors may find it more appealing to be alone in a timeout room than within the classroom. To be effective, timeout must be based on the removal of reinforcers known to work for a particular learner. Timeout ranges in complexity from simply turning away from a student (ignoring) to physically removing the student to a neutral room (Harris, 1985).

Timeout is a powerful technique for reducing behavior and should be used with great care. Parents, administrators, and significant others must be included in the decision making process before programs of this nature are implemented (Nelson & Rutherford, 1983). However, if less intense reductive measures are ineffective, timeout can be used.



Time-out ranges in complexity from simply ignoring a student to physically removing the student to a neutral room. Here, a time-out involves removing the student from the immediate environment to a nearby chair. (Courtesy of Kay Shaw)



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- If a timeout room is to be used, there should not be any reinforcers in that room (e.g., toys, books, view from window). However, the room should be comfortable in temperature and well-lit.
- There should be no locks on the door to the timeout room. If the teacher must hold the door shut, the wrong procedure is being used.
- For best results, a timeout room should have an observation window so that the learner can be monitored for injurious or self-stimulatory behavior. If either type of behavior occurs, the teacher should try another procedure (e.g., overcorrection—described in the next section).
- When escorting a learner to a timeout area, the teacher should refrain from all conversation except a brief statement of the misbehavior (e.g., “No throwing blocks”).
- If the learner has to be forceably dragged to timeout, the teacher should use another procedure.
- Timeout areas should be as close as possible to the teaching setting. This minimizes potentially reinforcing occurrences such as being seen by friends or other staff while walking to timeout.

- A student may engage in crying or temper tantrum behavior while in a timeout situation. In these cases, if the timeout period is to last for 1 minute, wait until the crying or tantrum stops, then time the 1 minute from that point.
- The length of a timeout session should only reflect what is minimally needed to affect the behavior. White, Nielson, and Johnson (1972) found that shorter durations of timeout appear to be more effective with severely retarded learners.
- Timeout should never be used in isolation. That is, to merely eliminate a misbehavior without replacing it by reinforcing an acceptable alternative behavior may result in other inappropriate outbursts.
- Whenever possible, remove the reinforcer from the learner instead of the reverse. For example, when working with severely and profoundly retarded learners, the teacher can remove a food reinforcer by simply turning around in the chair for a specified period of time (Smith, Piersel, Filbeck, & Gross, 1983). McReynolds (1969) used this technique when teaching language skills by removing a reinforcer (ice cream) when the learner exhibited other than the appropriate responses.
- Another, milder form of timeout involves asking students to leave the group for a short period of time by turning their chairs around (exclusionary timeout). After the time period (e.g., 2 minutes) the teacher would reinforce the student upon his or her return to the group.
- The following examples of timeout from positive reinforcement can be found in the research literature:
 - Removing a reinforcer worn by students if they misbehave (Foxx & Shapiro, 1978).
 - Moving students away from the activity to watch other students receive reinforcers for the correct behaviors (Porterfield, Herbert-Jackson, & Risley, 1976).
 - Use of a timeout room (MacPherson, Cander, & Hohman, 1974).

Overcorrection

Overcorrection is another procedure for decreasing inappropriate behaviors of retarded learners. Azrin and Foxx (1971) included in their toilet training program a reductive procedure that required the students to make some restitution for an inappropriate act (e.g., they had to take a bath and wash soiled clothing). Overcorrection is a mild punisher with two distinct variations: (1) restitutorial overcorrection and (2) positive practice overcorrection. Restitutorial overcorrection involves what Foxx and Azrin (1973) have described as requiring the person to correct the result of the inappropriate behavior by restoring the setting to a level that is better than it was prior to the occurrence of the incident. Students who deliberately spill their milk may be required to clean not only their table but also surrounding tables and the floor.

Positive practice overcorrection varies from restitutorial overcorrection by requiring the learner to practice the correct alternatives to the inappropriate behaviors. For example, learners who spill milk would have to practice correct pouring over a number of trials. Overcorrection can involve a combination of many behavioral techniques, including reinforcing alternate behaviors, using verbal

instructions, coaxing behaviors through graduated guidance, timeout, and feedback to the learner describing the inappropriate behavior. In many cases restitutional and positive practice overcorrection can be used together to achieve the desired result. Teachers should keep in mind, however, that although overcorrection has proved to be quite effective in reducing inappropriate behaviors such as self-injurious behavior (Azrin, Gottlieb, Hughart, Wesolowski, & Rahn, 1975), aggression (Foxy & Azrin, 1972), and classroom disturbances (Azrin & Powers, 1975), it is not a simple procedure to apply.



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- Teachers should choose alternative or corrective behaviors that relate directly to the inappropriate behavior. For example, if a learner throws objects, then the teacher should choose like objects for the learner to restore to their storage places. Similarly, a learner engaging in self-stimulating behavior such as tooth grinding might be required to brush his teeth.
- Teachers should keep talking to a minimum. A teacher should give only the verbal directions that are needed to direct the student's attention to the misbehavior and to the behaviors requiring restitution.
- As with all behavioral procedures, teachers should address all occurrences of the inappropriate behavior immediately. This suggestion requires that the classroom arrangement be such that a teacher, aide, or volunteer is in constant contact with the target learner.
- During the time that a learner is engaged in restitution or positive practice procedures, the teacher should avoid all forms of reinforcement (timeout). Further, Foxy and Azrin (1972) have suggested that a short additional timeout from reinforcement phase be extended beyond the time necessary to correct or practice the behaviors.
- Teachers should use appropriate graduated guidance procedures (refer to the earlier section of this chapter) when requiring the student to correct the misdeed or practice an alternative behavior.
- Overcorrection procedures have been demonstrated to work on classroom behavior problems. For example:
 - Having students recite the correct class rules (Azrin, Azrin, & Armstrong, 1977).
 - Controlling disruptive classroom behavior by positive practice methods (Bornstein, Hamilton, & Quevillon, 1977).
 - Positive and negative practice (Durana & Cuvo, 1980).

Professionals may find from experience that even mildly aversive procedures have a number of disadvantages. Punishment has been known to cause learner withdrawal, violent outbursts, and negative peer reactions toward the student being punished. Before an aversive program is implemented, teachers should give some thought as to how they will handle these potential negative side-effects should they surface. Keeping the suggestions given in this chapter in mind and

including parents, other professionals, and administrators in the development process should minimize problems.



KEY CONCEPTS



- Severe aversive stimuli such as paddling often lead to unwanted side-effects. Students may become aggressive or withdrawn or attempt to escape the situation when severely punished. Also, if students see teachers severely punish others, they may model those teacher behaviors.
- Students may learn to avoid punishers by not getting caught instead of by omitting the inappropriate behavior.
- Teachers should try positive differential reinforcement approaches first, before they use mild punishers.
- DRL techniques (differential reinforcement of low rates of behavior) lower students' rate of responses by reinforcing learners when they emit the behavior at less than a predetermined level.
- DRO techniques (differential reinforcement of other or zero behaviors) eliminate inappropriate behaviors by reinforcing the students if they do not emit the response within a certain time period.
- DRI techniques (differential reinforcement of incompatible behaviors) reinforce responses that compete with the unproductive behaviors.
- DRA techniques (differential reinforcement of alternative behaviors) teach students more desirable alternatives to unproductive behaviors.
- Response cost is a system of levying fines when students break prespecified rules. It is usually applied in conjunction with token economy systems.
- Timeout may be one of the most abused of the behavioral procedures. It should not be used for long periods of time (e.g., 15 minutes or 2 hours) because it results in the teacher being timed out from the student and probably has little effect on the target behavior (Vandever, 1983).
- Nonseclusionary (exclusionary) timeout procedures are preferable to seclusionary timeout procedures.
- Both restitutional and positive practice overcorrection procedures can be effective techniques for decreasing behaviors.

GENERALIZATION OF SKILLS

Skills taught in an isolated classroom setting, under conditions different from those in the learner's natural environment, may not be demonstrated by the student in the community setting. Therefore, careful consideration must be given to transferring control of behavior to natural reinforcers.

Intermittent Reinforcement

Initially, teaching skills to retarded learners (acquisition) generally requires reinforcing these students on a *fixed ratio* scale of one to one (e.g., reinforcing the learner after each occurrence of the target response). This procedure is important at the beginning of skill acquisition; however, research results indicate that it is not a durable schedule that will maintain behavior over long periods of time. This schedule of reinforcement is artificial; it does not reflect a true picture of how behaviors are naturally reinforced in the environment. Therefore, once the retarded learner has demonstrated some competence in a skill area, it is best to move to an intermittent schedule of reinforcement that cannot be predicted by the student.

The two schedules that most resemble naturally occurring events are called *variable ratio* (VR) and *variable interval* (VI) schedules. VR schedules allow teachers to reinforce target behaviors on an average of correct responses that cannot be predicted by the student. For example, a teacher may reinforce a student after five correct math problems on one day, after seven correct problems the next day, after 11 correct problems the next day, and so on. The unpredictability of the schedule maintains the behavior.

VI schedules work in much the same fashion, except the reinforcer is dependent on the average length of time the student engages in the target behavior. Therefore, a student may be reinforced for production behavior in a workshop on an average of every 10 minutes with the lengths of the interval varied slightly (e.g., 11 minutes, 15 minutes).

By adding a *limited hold* component to VI schedules, teachers can increase the efficiency of the technique. Limited hold components restrict the length of time after the interval has occurred that the students can receive their reinforcers, thus forcing them to respond quickly. For example, teachers often state that at the end of a 2-minute interval the bell will ring and those students working quietly will receive a token. Adding a 30-second limited hold time period after the bell allows the students to get seated and organized, increasing their chances for reinforcement. In the community, a student may learn to ride an elevator by pushing the button and waiting an average of 2 minutes (VI 2). When the door opens, the student may have 10 seconds of a limited hold to enter the elevator before the door closes (VI 2, LH 10 sec.).

Generalization

Teaching retarded learners isolated skills and then hoping the skills will carry over into their everyday lives is not a sound educational practice (Stokes & Baer, 1977). Teachers need to consider more sophisticated techniques designed to program for generalization. For example, teachers can include activities in their programs that allow students to practice skills across settings, persons, materials, and time (Langone & Westling, 1979). For example, generalization can be increased across

settings by allowing students to practice mobility skills on different types of buses or alternate transit systems. Similarly, when a learner is trained to perform specific custodial skills by one person, generalization may be enhanced by using a number of supervisors to monitor the learner. The possibilities for innovative generalization training exercises are endless. They include staggering training times, substituting new materials, and increasing the number of different mainstreaming alternatives, among other techniques.

Teachers should consider switching to natural reinforcers as soon as possible (Stokes & Baer, 1977). For example, training severely retarded learners to match appropriate colors or designs of clothes can be switched to natural reinforcers when the learners are placed in community activities where others have the opportunity to comment on their dress. In these instances the teacher can encourage the participation of community volunteers.

In their research review, Stokes and Baer (1977) found support for using more than one stimulus at a time to enhance the generalization of the target skill(s). Teachers can accomplish this by using techniques such as simultaneously including two trainers or concurrently training a skill in more than one setting. Also, using more than one teaching technique during a training session, for example, ignoring inappropriate behaviors while reinforcing alternate ones, appears to facilitate generalization more than just applying one procedure.



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Retarded learners may generalize skills across different settings, materials, and time more efficiently if they are accompanied by the same person under all conditions. The use of peer tutors is a highly effective method that continues to gain in popularity and can be used effectively in resource, self-contained, and community training situations (e.g., Donder & Nietupski, 1981).

- Before mainstreaming learners into regular or vocational classrooms, teachers should choose general education students from those classes and pair them with the retarded learners in a tutoring situation. When the retarded students move to the regular class settings, the peer tutors accompany them.
- Peer tutors can be valuable in helping retarded students generalize learned skills to community settings. For example, a teacher might have a peer tutor teach a student shopping skills in the classroom and then accompany the student to local grocery stores or help generalize social skills across settings (Shafer, Egel, & Neef, 1984).

Another consideration that has important implications for teachers of moderately or severely retarded learners involves using less structured teaching techniques. The initial teaching of a skill often requires structured teaching techniques such as prompts, models, and guidance. As the student becomes more competent

in the task, the teacher can "loosen up" the structure of the techniques so that they are more representative of actual community stimuli (Stokes & Baer, 1977). For example, a teacher using very precise, slowly presented models for teaching addition skills may "loosen up" by speeding up the models or combining two steps at a time after the learner has reached a certain competency.



KEY CONCEPTS



- Retarded learners do not readily generalize skills across persons, places, and time.
- Intermittent reinforcement is one method of helping students generalize skills. Essentially, this reinforcement schedule prevents students from predicting when they will be reinforced, and thus promotes more durable behavior over time.
- Variable ratio (VR) schedules allow teachers to reinforce behaviors after an *average of correct responses*.
- Variable interval (VI) schedules allow teachers to reinforce behaviors after an *average length of time* that they occur.
- Natural reinforcers improve generalization of skills.
- Peer tutors and a variety of trainers also help students to generalize skills.

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CURRICULUM AND DAILY PLANNING

■ Prior to this decade, public school programs had very little, if any, contact with severely retarded students and no contact with profoundly retarded learners. These individuals were confined to programs within state institutions or in self-contained training centers run by the states or by private groups such as local chapters of the Association for Retarded Citizens (ARC). Curriculum under these circumstances usually meant custodial care for some, basic self-care training for others, or the possibility of participating in arts and crafts activities. Isolated programs did, at times, develop activities that involved vocationally related skills; however, these options often came about because a small group or one person developed the idea. Unfortunately, when these individuals left, the programs often left with them.

TRADITIONAL APPROACHES TO CURRICULUM DEVELOPMENT

In the past, public school programs were primarily concerned with program development for the mildly (EMR) and moderately (TMR) retarded students. Mildly retarded learners generally were housed in classrooms located in regular school buildings, but curriculum for these students was quite different from that of their general education peers. Reynolds and Birch (1982) identified three types of adaptations in curriculum for the mildly retarded: (1) the regular curriculum was slowed down; (2) the regular curriculum was simplified; (3) the regular curriculum was stretched out.

By slowing the regular curriculum down, teachers would put off the presentation of certain skills to later in the retarded learner's life. Simplifying curriculum

amounted to omitting certain skills not deemed important for the learner, while stretching out the curriculum referred to repetition or increased practice of a given skill. All of the adaptations are acceptable techniques; however they were taken out of context when applied to a total group of mildly retarded learners. Curriculum guides developed as a result of these philosophies incorporated these adaptations specifically for mildly retarded learners.

Moderately retarded learners were always looked upon as being educationally different from students with mild cognitive deficits because of their perceived inability to attain competencies in basic academic skills. Therefore, their educational prognosis was based on their ability to become "trained" in self-care skills, social adjustment, and work habits in sheltered or semisheltered environments.

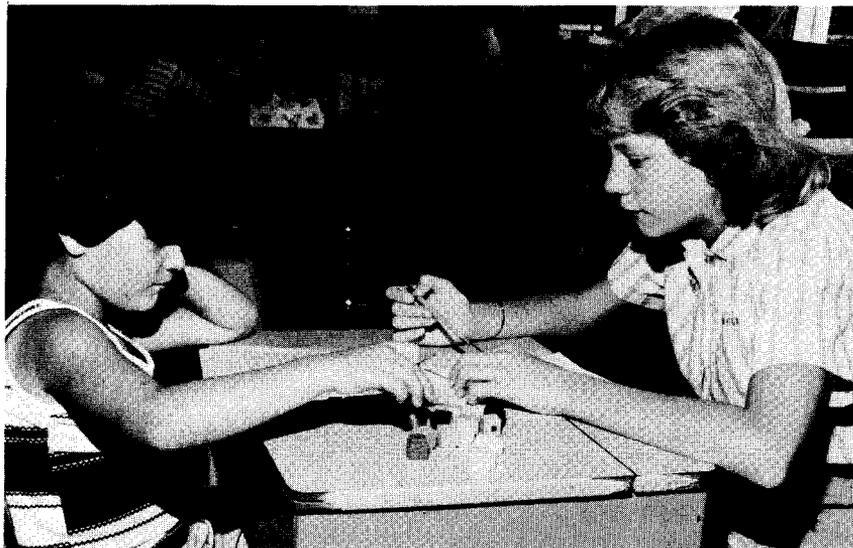
As with the mildly retarded learners, professionals felt that they needed to develop "separate" curricula for the moderately retarded. The resulting product was always based on a semidependent rather than a semi-independent attitude (Dunn, 1973). Consequently, curriculum options for these learners generally were not designed to allow the students to reach their true potential.

The implications of these approaches to designing curriculum for retarded learners still have an impact today. Moderately retarded students who previously were in self-contained special centers have been moved to regular school buildings. Severely retarded learners previously excluded from school programs can now be included, while in some parts of the country classes for profoundly retarded learners fall under the auspices of public schools and employ certified teachers. Although the field is moving in the right direction as far as public school placement, there has not been enough of a shift away from traditional approaches to developing curriculum for these learners.

In practice, the prevailing approach of developing one curriculum per group of learners still exists. The individualized education program (IEP) is in place in all areas of the country, yet in practice some professionals still pick objectives for students with little input concerning their specific strengths and weaknesses. In addition, there still appears to be the tendency to teach academically related objectives to students who do not require them. For example, some curricular options for severely retarded learners have become facsimiles of an academically based model, exposing them to academic readiness activities (e.g., identifying shapes). In some instances, the practice of incorporating more appropriate curricular options into daily instruction has not caught up with the trend toward placement in the least restrictive environment.

BRIDGING THE GAP

This chapter was written to provide teachers with a bridge between the process of designing curriculum presented in Chapter Three, the instructional methodology presented in Chapters Four through Six, and the remaining half of the text dealing with specific curricular areas. The information presented here provides teachers with strategies for designing daily plans after the students' IEPs have been developed.



The Individualized Education Plan (IEP) is the first step toward designing curricula appropriate for individual students. (Courtesy of Kay Shaw)

The following section presents teachers with the prevailing issues in curriculum content for retarded learners. Knowledge of these issues may help teachers make more informed judgments about choosing appropriate curricular options for these students.

Curriculum and the Community

One of the largest stumbling blocks facing educators of the mentally retarded involves the isolation of these learners from the community. The dominant practice is to teach skills in relatively sterile public school classrooms using materials that have little relationship to items readily available in daily living environments. A major trend, however, is to structure curriculum so that learners have the option to either practice school-learned skills in their natural environments or actually learn the skills within the context of the community itself.

A number of educational principles have surfaced in the literature supporting similar "natural" interventions. These principles relate to both research and instruction and emphasize the need to identify procedures and objectives that are important to learners (clients) as well as the community in which they live (e.g., ecological theory, Apter, 1977; ecological validity, Brooks & Baumeister, 1977; ecology of special education, Winschel & Ensher, 1978; and social validity, Wolf, 1978). In each of these instances (although some points differ) there is a similar underlying theme.

Social Validity

Social validity is a concept found primarily in applied behavior analysis research, a technology demonstrating great success with changing the behaviors of retarded learners (Whitman & Scibak, 1979). Clarifying the concept of social validity, Wolf (1978) identified three judgments that need to be made before applied behavior analysis research can be considered valid: (1) social significance of the program goals; (2) social appropriateness of the techniques used to change behavior; and (3) social importance of the effects of the behavior change. These judgments are directed toward the effects behavioral programs have on all people; however, there are specific implications that can be related to programs for retarded learners.

First, developing socially significant goals is the foundation for any teaching program. Traditionally, professionals have developed program objectives based on their judgment concerning what skills are appropriate for a retarded student to learn. The result is often the design of curricular options that have very little relevance to the learner's present role in the community (family and neighborhood environments) or future role (group home living and vocational options).

When developing socially significant goals, professionals must take into account the needs of the learner, the family, and the community in which the learner resides or will reside. For example, teaching communication skills in the classroom may result in teaching isolated sounds or simple words based on the objectives of a commercial language program. An alternative would be to record the types of communication existing between parent and child in the home environment. Valuable clues can be identified concerning any verbal or nonverbal communication that occurs. This approach provides a base on which to build the classroom curriculum options in the communication area. Chapter Three provided guidelines for developing community needs assessments (CNAs) that are vital for collecting this type of information.

The second characteristic of social validity discussed by Wolf (1978) addresses the procedures or techniques used to change the behaviors of learners. This factor is determined by comparing the ethical considerations, cost, and utility of the program in relation to the outcomes or changes in behavior. Ethical considerations are most important in light of the documented abuse and misuse of behavioral procedures with this population. Therefore, when using any procedure that is designed to reduce behaviors by use of aversive consequences it is best to include parents, administrators, community/professional advisory boards, and whenever possible the students themselves from the outset (see Chapter Six).

Further, teachers must keep in mind the utility and cost of implementing a program when weighing actual outcomes. An important trend is to provide hard evidence that a given intervention is affecting the behavior of the student. Accordingly, the tenets of social validity require that a system of continuous monitoring of pupil progress be devised to evaluate program effectiveness (see Chapters Four and Five). Teachers must also consider whether or not there are more efficient methods of obtaining the desired behavior change.

Finally, professionals must be aware of the social importance of the program

(Wolf, 1978). Teachers should obtain information concerning the opinion of the learner after the conclusion of the program (whenever possible) and sample the overall effects of the behavior change on the family and community interactions.

Successes can be short-lived if retarded students do not generalize learned skills to other settings, in the presence of people different from the original trainers, and even at different times of the day or with different materials. This problem underscores the need to develop curricular options that systematically allow these students to practice skills in their community environments. Using these strategies, teachers can evaluate the effects that changes in behavior are having on learner-community interactions. For example, students who learn to communicate using a combination of oral plus manual responses may be quite successful in making their needs known to school personnel. However, when they attempt to order a hamburger at a fast food restaurant they become quite frustrated if they are unable to get their point across. For a retarded learner to be satisfied with the results and the community to be a useful part of the learner's life, curriculum must address this aspect of social validity.

Ecological Issues

The issues of the ecology of special education, ecological theory, and ecological validity were mentioned in conjunction with social validity. In each of these approaches, the primary emphasis is on close inspection of the interaction between students and their daily environments. The implications for these approaches are straightforward, supporting the need for more student and community interaction (Stainback & Stainback, 1984; 1985). Therefore, teachers must be cognizant of the fact that community education (Apter, 1977; Seay, 1974) requires moving the classroom from the confines of the school building into the realistic settings of cities, towns, and villages as needed.

Before professionals can break the traditional molds of teaching in neatly ordered classrooms, they must first grasp the notion of teaching functionally related skills. Conversationally, functional curriculum options have existed for years, however in practice these skills are at times taught in a vacuum. In order to better grasp the true meaning of a functional curriculum, the following sections present some of the emerging trends in curriculum development for the different severity levels of mental retardation.

TOWARD AN APPROPRIATE CURRICULUM: MODERATE AND SEVERE RETARDATION

Educational programs still exist where academic-prerequisite-based curriculum options find moderately and severely retarded students completing worksheets and other activities that have little relevance to community living (Langone, 1981). In contrast, there are professionals who are expanding the trend of developing

age-appropriate curricula by teaching in the natural setting (e.g. Brown, et al., 1979; Brown, et al; 1981). Brown and colleagues (1979; 1981) have argued that teachers must distinguish between functional and nonfunctional skills, defining functional skills as those that increase the probability for independent community living. A teacher who is spending a considerable amount of time attempting to teach the labeling of primary colors may be teaching nonfunctional skills. Conversely, a teacher who is instructing the learner to discriminate colors by sorting various colored transistors at a community job tryout site is probably teaching functional skills. Appropriate curriculum options also include the materials and conditions under which the skill is taught (Brown, et al., 1979).

The problem of age-appropriateness must also be addressed. According to Brown and colleagues, "Most curricula offered through age 21 are designed to teach handicapped students how to function as nonhandicapped children under the age of 5" (1981, p. 624). This problem stems from the belief that a public school curriculum addresses only academically related skills. As a result, programs still exist that continue to teach skills such as letter and number identification and basic eye-hand coordination using paper and pencil or pegboard activities, up to and including the learner's last years in school.

The future of curriculum development for the moderately and severely retarded will improve if teachers will take some common-sense measures to change the prevailing practice of nonfunctional and non-age-appropriate curriculum design. Brown and colleagues (1979) have suggested developing curriculum based on the learner's present needs and a best estimate of future needs in a minimum of four curricular areas: vocational; domestic; recreation/leisure, and community functioning. Teachers will first need to gather information concerning the learner's present strengths and weaknesses; present home and community life; and what the learner's needs will be in 2 years, 5 years, and 10 years (Langone, 1981). In this instance, curriculum is future-oriented, its goal being to move learners ahead into more practical activities that are geared to their needs.

Brown, Nietupski, and Hamre-Nietupski (1976) presented a concept called the *criterion of ultimate functioning* that best illustrates the trends in educating these students. The criterion of ultimate functioning is in a sense a yardstick by which professionals should measure curriculum options, attempting to judge whether or not the activities are of true worth to the learner. This concept covers the characteristics, abilities, and skills a person must be able to demonstrate in order to participate as independently as possible in society. Activities teachers choose must relate to some form of independent functioning. For example, a program that uses exclusively materials such as puzzles, games, and pegboards that are based on academic prerequisite skills probably has little or no relationship to a severely retarded person's ultimate functioning.

There are several implications teachers should keep in mind when developing curricula for individuals with significant mental retardation. Initially, teachers should resist the temptation to teach a skill in the same fashion that would ordinarily be used with the general population. Instead, they should spend time thinking about what White (1980) referred to as the *critical function of a behavior*. Establishing the critical function of a behavior or set of behaviors involves recog-

nizing that there is more than one way to perform any given skill. For example, an 18-year-old student may have little or no reading skill. Taking into account the student's time left in school and his cognitive deficits, professionals must decide on options related to vocational training and placement. Some teachers might decide to identify potential employment outcomes requiring no reading while others might attempt to begin teaching reading in a traditional fashion, starting with the basics such as letter identification. Unfortunately, both options may be inappropriate—the first limiting the learner to fewer vocational opportunities with less chance for advancement, and the second being highly unlikely given the student's age and learning history. One alternative in this case would be to identify the technical vocabulary required for several employment outcomes and to teach those words using a whole-word approach in both the school and the natural environment.



IDEA FILE



Concepts such as Brown's criterion of ultimate functioning and White's critical functions have implications for all retarded learners. It is generally easier to relate these issues to education of the severely retarded, because curriculum for these learners must be functional in the sense of addressing basic self-care and leisure activities. Relating these concepts to education of the mildly retarded is not as obvious, but still is important. Brown, and colleagues (1976) developed six questions concerning curriculum design for severely handicapped students. Teachers should decide whether or not these questions are viable ones for application with any level of retardation besides the severely handicapped:

1. Why should we engage in this activity?
2. Is this activity necessary to prepare students to ultimately function in complex heterogeneous community settings?
3. Could students function as adults if they did not acquire the skill?
4. Is there a different activity that will allow students to approximate realization of the criterion of ultimate functioning more quickly and more efficiently?
5. Will this activity impede, restrict, or reduce the probability that students will ultimately function in community settings?
6. Are the skills, materials, tasks, and criteria of concern similar to those encountered in adult life? (p. 9).

TOWARD AN APPROPRIATE CURRICULUM: MILD RETARDATION

The questions presented in the Idea File also apply to mildly retarded learners. In some instances, however, these learners may be participating in activities involv-

ing traditional academic skills worksheets and other materials where little attempt is made to generalize these skills to community activities.

Generally, curricula available for mildly retarded learners provide few options addressing occupational readiness, career awareness, and independent living skills. For example, when mildly retarded learners are enrolled in a geography class they may be attempting to learn the capitals of all the states in the United States instead of learning the skills of map reading that can facilitate mobility in cities and rural environments.

The concepts of social validity and ecological special education apply to mildly retarded learners as well as to students of other severity levels. These conceptual issues have had different effects on trends in curriculum development for the mildly retarded. Specifically, the following three educational trends in special education for mildly retarded learners are having a great impact on curriculum development:

1. Special educators are assuming a primary role as consultants as opposed to being entire service providers.
2. Competency based education is resulting in minimum performance standards for high school graduation.
3. Interrelated or noncategorical grouping of mildly handicapped students demonstrating similar learning problems is becoming more prevalent.

Mainstreaming

Traditionally, EMR (mildly retarded) students were taught in self-contained classes under the guidance of a certified special education teacher. Certain progressive districts allowed their EMR learners to participate with the general student population in activities such as physical education, music, and lunch. Today, thanks to P.L. 94-142 and an increased knowledge base, the trend is to include mildly retarded learners with their general education peers in regular class options with support services provided by special education. This trend changes the focus of the special education teacher from primary service provider to consultant or support service provider.

The shift in teacher role also affects curriculum development for the mildly retarded. Alternate or separate curriculum options for this population are decreasing. Instead, curriculum options now reflect modifications in regular course content, identifying the important objectives that meet a retarded learner's daily living needs. For example, a mildly retarded learner enrolled in a political science class may not need to memorize the number of Congressional representatives from Georgia. Rather, more important objectives may be to know and be able to contact the representative from the student's district, correctly participate in the voting process, identify election issues, and categorize candidates according to those issues. Pinpointing important objectives and omitting those not necessarily pertinent to the life of the individual is a vital step in the curriculum development



Mainstreaming EMR students includes them with their general education peers in many school activities. (Courtesy of Kay Shaw)

process. The movement by state legislatures toward minimum performance standards is providing the thrust for identifying the basic and most important skills necessary for community survival.

Minimum Competency Testing

Minimum competency testing (MCT) resulted from a public concern for more accountability in education (McCarthy, 1980). Briefly, MCT involves identifying basic skills needed for graduation and testing students for competency in those areas, thereby setting standards for receiving diplomas at the high school level. These programs have caused a great deal of concern for both parents and professionals regarding their impact on handicapped learners. For example, there are questions concerning whether a handicapped student should meet the MCT requirements or the requirements designated on the IEP for graduation. In addition, questions are being asked as to the feasibility of exempting certain categories of handicapped students (McCarthy, 1980) and the ramifications of developing special diplomas as well as certificates of completion when a learner fails to meet the minimum competencies (Westling, 1978).

These issues have been and will continue to be scrutinized by both the public and professionals. States are addressing these and other questions, with the result that some test modifications have been implemented for specific handicapping conditions and remedial programs have been made available to all students including the handicapped (Westling, 1978; Grise, 1980). The important considerations, however, are in identifying the ways that MCT will effect curriculum development for mildly retarded learners.

Ross and Weintraub (1980) presented a flexible policy approach for developing specialized curricula devised by modifying regular programs to accommodate the needs of the learner. They suggest that the MCT for these learners be based on the criteria targeted for each individual. Interestingly, what is important here seems to be the philosophical approaches taken by the various participants in the MCT debate. The field of special education has been moving toward educating mildly retarded learners in general classrooms, yet since the issue of MCT has arisen there appears to be a movement back to a form of separation reflected by special education diplomas and specialized curricula.

States do appear to be concerned with the problems involved with MCT, but its benefits should not be overlooked. This movement appears to have the positive effect of directing professionals' attention toward the key educational objectives needed for success in society. This residual effect on curriculum development alone lends credibility to the MCT movement. For example, Georgia has identified five cluster competency areas that students must address before they become eligible for a diploma:

1. The learner, including basic academic skills applied to daily functions.
2. The individual, including competencies in physical and mental health, leisure time, and personal family role.
3. The citizen, including skills related to the function of government, legal rights of citizens, and the citizens' impact on the quality of the environment.
4. The consumer, including competencies in personal finance and budgeting and consumer rights and responsibilities.
5. The producer, including skill areas of career awareness and participation in vocational education programs. (Obtained from the State of Georgia High School Graduation Requirements, Policy IHF, Georgia Department of Education, Atlanta, Georgia, 1980.)

Within each of these areas appropriate behavioral objectives are being developed and subsequent assessment procedures designed to measure whether or not the learner has mastered the competencies for graduation.

Curricular content similar to those areas presented in the Georgia example have one distinct advantage over traditional curricula that have stressed a college preparatory approach. By identifying curricular options important to any person, including those who also happen to be mentally retarded, education is realizing that there exist generic skills that are needed by all students. For example, learning more about the safeguards that industries should impose upon themselves in order to protect the environment and how industries can be monitored by citizens is a viable

set of skills for junior high and high school level students. These skills may also be viable for many mildly retarded learners. When learners cannot grasp these concepts, they can be exposed to more appropriate skills such as protecting their neighborhood environment by not wantonly cutting trees, spilling household chemicals, or littering. Conceivably, a majority of mentally retarded learners could benefit from educational exposure to the competencies listed in the state of Georgia's citizen cluster. When competencies pertaining to independent living skills are identified for all persons, retarded learners can participate in the same curriculum as all other students.

One problem with competency-based education is that regular educators will assess students' mastery of the competencies using traditional paper-and-pencil methods. This puts mildly retarded learners at a distinct disadvantage because of their poor reading and writing skills. Therefore, when working within a competency-based curriculum structure, a vital component of the system will be to design assessment procedures that allow learners to demonstrate competence in a skill area by performing it in an actual community setting. Teachers who are aware of this fact can assist state and local curriculum committees in developing options for assessment of curriculum components that are more appropriate to the strengths and weaknesses of retarded learners.

Noncategorical Grouping

One final trend affecting curriculum development for mildly retarded students is the movement toward noncategorical special education classes. The basis for this approach is that teaching techniques are generic; that is, all good teaching involves arranging environmental stimuli to increase the probability of student learning (Bateman, 1967; Neisworth & Greer, 1975). This movement focuses on student learning problems instead of on the traditional labeling systems of EMR, learning disabled (LD), or behavior disorders (BD). For example, teachers of any handicapped student with learning problems can note similarities in what Neisworth and Greer (1975) have identified as problems in ". . . auditory, visual, or tactile discrimination, reversals in reading, short term recall deficits, motor awkwardness, hyperactivity, distractibility and other behaviors that define psychoeducational repertoires of children" (p. 19).

Teachers can only deal with observable behaviors, not hypothetical causes, and their observations of MR, LD, and BD students reveal remarkable similarities in learning problems (the possible exception being a slower rate of learning in mildly retarded students). An analysis of effective teaching behaviors identifies a number of generic instructional competencies that are characteristic to all good teachers regardless of content speciality (Schwartz & Oseroff, 1975; Reynolds, 1978). The trends in methods, materials, and curricula resulting from a non-categorical approach are as follows:

1. Generic assessment procedures stressing criterion-referenced testing (Howell & Kaplan, 1980).

2. Behaviorally based methods for changing academic and social behaviors (White & Haring, 1980; Cooper, 1981).
3. A total approach involving forms of diagnostic-prescriptive instruction (Stephens, Hartman, & Lucas, 1982; Mercer & Mercer, 1981).

Public school budgetary problems have helped increase noncategorical classes for handicapped students with learning problems. This is especially true in small districts where the student population is not large enough to make it economically feasible to staff more than one resource class.

The final implication of noncategorical grouping for curriculum development involves teachers' abilities to sequence curriculum options so that the system can meet the needs of any student entering the class. As a result, professionals will be less concerned with students' labels and justifiably more concerned with their functional level.

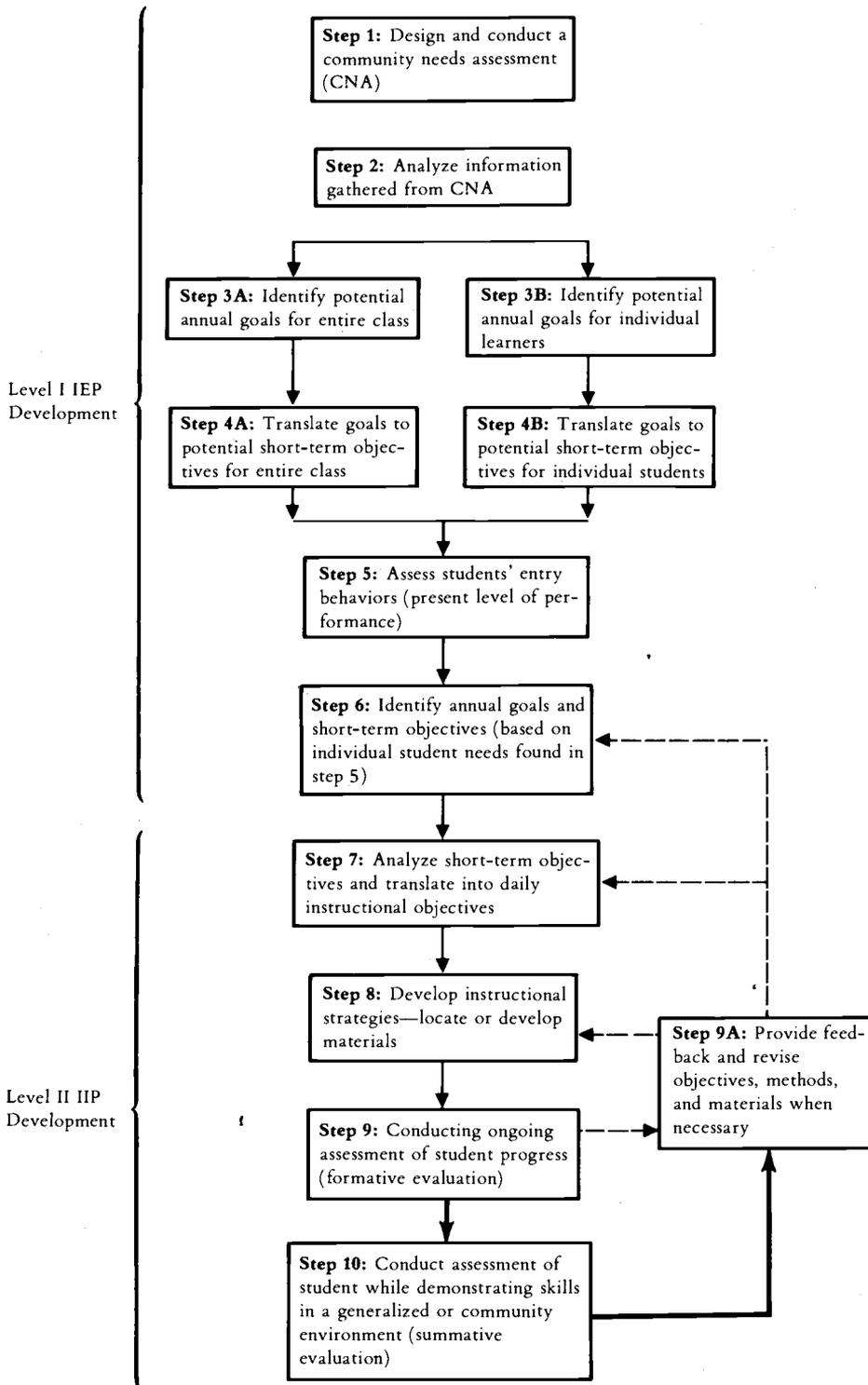
The concept of the functional level of students, however, does not refer to their interactions only within the school classroom. Rather, it involves a comprehensive evaluation of learners interacting with all aspects of their environment. In this way, teachers can better understand the desired end product of curriculum; that is, to assist the learner to function within community environments as independently as possible.

DAILY PLANNING: THE INDIVIDUAL IMPLEMENTATION PLAN (IIP)

An IEP is both an ending and a beginning. It is the ending of a process that included many people analyzing the environment and assessing a student's present level of performance and culminated in the development of a set of curriculum goals and objectives based on that student's needs (French, 1983). It is a beginning in the sense of its relationship to the daily teaching strategies that educators use (see Figure 7.1).

Some teachers mistakenly assume that the IEP is the plan from which they must teach. IEPs, by definition, are management plans that cover the entire year. Thus, an IEP would be too general to teach from on a daily basis. The IEP development ends with the committee, and its implementation lies in the hands of the teachers involved with the student. The key word here is *translation* (see Chapter Three)—the ability of the teacher to translate the short-term objectives of the IEP to smaller, more workable components called *instructional objectives*.

Accomplishing the move from IEP objectives to daily instructional objectives requires the use of task analysis. The arrow between steps 6 and 7 of Figure 7.1 represents the task analysis (translation) of the IEP's short-term objectives to the instructional objectives of the individual implementation plan (IIP). The first activity is to analyze and sequence the skills needed by a student to successfully complete the short-term objective. Next, the teacher has the option to convert the steps of the task analysis into objectives that conform to the outcome, context, and criterion format. Some skill areas are complex and require the structure of a written objective (e.g., academic skills such as decoding); other skills areas are



■ **FIGURE 7.1**
A Systems Approach for Designing Special Education Curricula

fairly straightforward and may not require that an objective be written in standard form (e.g., lifting spoon to mouth, picking up an object).

Instructional Objectives

The same process as described in Chapter Three is used for task analyzing short-term objectives. It includes the following steps:

1. Use a team to analyze complex tasks.
2. Consult other task sequences if available.
3. Analyze the task in relation to existing materials and environment.
4. Match the skill sequence in relation to individual learner needs.
5. Order skills in relation to the next step in the sequence.
6. Decide whether to use a forward or backward chaining procedure if appropriate.
7. Write subskills (steps on task analysis) in measurable form.

In an example used in Chapter Three involving the student's use of diphthongs, the short-term objective was as follows:

Outcome: The student will recognize and pronounce the sounds ou, ow, oi, oy, aw, ew.

Context: 30 whole words on the second and third grade levels.

Criterion: Between 80% and 90% accuracy.

In this instance, the task analysis is basically complete because the subskills are identified:

1. Pronounce the sound ou in context.
2. Pronounce the sound ow in context.
3. Pronounce the sound oi in context.
4. Pronounce the sound oy in context.
5. Pronounce the sound aw in context.
6. Pronounce the sound ew in context.

At this stage, the teacher can decide whether to convert the skills into the outcome, context, criterion format. No rule of thumb exists concerning whether such a conversion is necessary; however, in a general sense the more systematic the objective the more systematic the instruction. Academic skills generally require a systemic approach, and teachers should consider writing objectives that are as concise as possible. Take, for example, the second skill in the example sequence. In its present form a teacher may forget that there are alternate uses of the vowel diphthong "ow." A systematic instructional objective for this skill might be:

Outcome: The student will recognize and pronounce *ow* when found in words such as *blow*, and *mow*. The student will also recognize and pronounce *ow* when found in words such as *plow* and *how*.

Context: Five words for each form.

Criterion: 100% for each set.

What remains is to write the instructional objectives for the remaining five skill areas.

Teachers may wish to keep two important considerations in mind when writing objectives. First, in most cases (especially with academic skills) objectives will need only minor modifications to meet individual student needs. Therefore, writing objectives should not be a laborious or never-ending task. With the advent of microcomputers, teachers can routinely store their objectives for instant retrieval when needed.

Second, a well-written objective will provide the teacher with more than just a management statement (Bepko, 1981). It also provides the basis for assessment questions (Tymitz-Wolf, 1982). For example, in both the instructional and short-term objectives illustrated in the example, the assessment components are clearly delineated (e.g., 30 whole words with 80% to 90% accuracy and five words each form with 100% accuracy).



IDEA FILE



Microcomputers can be the single greatest tool that educators have for teaching handicapped students. If teachers do not become computer literate over the next 10 years, they may be left behind in the field (Goldenberg, Russell, & Carter, 1984). Throughout the remainder of this text, examples will be provided of how microcomputers can assist instruction in most of the curricular areas. At this point, teachers should consider the use of microcomputers as management tools. As objectives are written by teachers in a school district, they can be stored on floppy disks and shared among teachers. Accomplishing this storage requires that a standard coding system be used. One example of a coding system uses numbers in sequence by assigning a whole number to a goal, the whole number plus a decimal to short-term objectives related to the goal, and so on down to instructional objectives (see Table 7.1). For example:

- 1.0 Goal
 - 1.1 Short-term objectives (STOs) related to the goal
 - 1.2
 - 1.3
 - 1.4
 - 1.11 Instructional objectives (Os) related to STO 1.1
 - 1.12
 - 1.13

- 1.21 IOs related to STO 1.2
 1.22
 1.23
 1.24
- 1.31 IOs related to STO 1.3
 1.32
- 1.41 IOs related to STO 1.4
 1.42
 1.43
 1.44
 1.45
-

TABLE 7.1 *Examples of Coded Objectives*

Arithmetic Example

- 1.0 Annual Goal: The student will be able to perform the basic operations in arithmetic.
- 1.1 Short-Term Objective: Outcome: The student will correctly compute addition problems at all levels up to carrying in alternate places.
 Context: 35 problems—written worksheet.
 Criterion: 80%–90%.
- 1.11 Instructional Objective: Outcome: Add with basic facts 1–10.
- 1.12 Instructional Objective: Outcome: Add with no carrying (up to two columns).
- 1.13 Instructional Objective: Outcome: Add by carrying from the one's place.
- 1.14 Instructional Objective: Outcome: Add by carrying from the ten's place.
- 1.15 Instructional Objective: Outcome: Add by carrying from consecutive places.
- 1.16 Instructional Objective: Outcome: Add by carrying from alternate places.
- 2.1 Short-Term Objective: Repeat for subtraction.
- 3.1 Short-Term Objective: Repeat for multiplication.
- 4.1 Short-Term Objective: Repeat for division.

Reading Example

- 1.0 Annual Goal: The student will read orally from a second grade passage, correctly pronouncing words that include consonants.
- 1.4 Short-Term Objective: Outcome: Consonant blends (pl, sm, cr, fr, tr, gr, pr, bl, sl, st, sw, cl, dr, br, sp).
 Context: When presented in a word (pronounce whole word).
 Criterion: 50 words—90%–100%.
- 1.41 Instructional Objective: Outcome: br, cr, dr, fr, tr, gr.
- 1.42 Instructional Objective: Outcome: bl, cl, fl, pl, sl.
- 1.43 Instructional Objective: Outcome: sm, st, sw.
-

More commercially produced IEP software hits the market daily. These software packages may be of use to teachers and administrators for managing an IEP data base. Following is a representative sample of companies that market these systems:

Ex-Ed Computer System
71-11 112th Street
Forest Hills, NY 11375

Learning Tools
686 Massachusetts Avenue
Cambridge, MA 02139

Screening and Tracking Corp.
of America
90 Kent Street
Brookline, MA 02146

Teaching Pathways
121 East 2nd Avenue
Amarillo, TX 79101

Turnkey Systems
256 N. Washington Street
Falls Church, VA 22046-45

The second example used in Chapter Three concerning Steve's leisure/recreation skills, may be useful in following the translation of IEP objectives to daily instructional objectives. The short-term objective that may have been included on Steve's IEP was:

6.1 *Outcome:* Student will select a talking book tape, place tape in recorder, and turn on recorder.

Context: Selection from 10 talking books.

Criterion: Selection (not critical). Correct manipulation of tape and recorder.

One possible task analysis for this short-term objective could include the following skill sequence:

- 6.11 Independently maneuvers wheelchair to listening center.
- 6.12 Locates and selects desired tape.
- 6.13 Removes tape from tape rack.
- 6.14 Removes cartridge from container.
- 6.15 Pushes eject button on recorder.
- 6.16 Places cartridge correctly in recorder.
- 6.17 Closes dust cover.
- 6.18 Places earphones on head.
- 6.19 Pushes play button.

- 6.110 Adjusts volume and tone as needed.
- 6.111 Demonstrates use of forward and reverse functions.
- 6.112 Removes tape and returns to rack (reverse previous steps).
- 6.113 Steps 1–12 generalized to home environment.

This skills sequence could be used with many students and would only need adaptations based on student needs. For example, if Steve were physically unable to complete most of the steps, there would be an important need to include instruction in the communications skills required to seek assistance (e.g., manual signing, pointing to pictures). Another possibility might be that Steve could manipulate the “on” and “off” functions of the machine if a sensory switch were installed. The skill sequence would then need to be slightly altered to account for the training required to work such a device.

The example illustrates an instance in which a teacher may not need to convert the steps of a task analysis into an outcome, context, and criterion format. In its present form, the skill sequence represents an example of a procedural task analysis where each step is essentially independent of the others and would be taught using a chaining procedure. The teacher generally would expose the student to all the steps during an instructional trial. The subskills are written in such a way that the teacher can record whether or not the subskill was completed by the student. In this case, the subskills are probably precise enough to allow for an accurate appraisal of learner progress. Psychomotor skills (e.g., self-care and some vocational tasks) *generally* can be taught from the task analysis without converting each step to an instructional objective.

Developing Educational Interventions

Educational interventions include a number of components (e.g., strategies for changing behaviors, educational materials, assessment strategies) that when linked together increase the probability that the students will learn the skills targeted for instruction. Developing these interventions, or lesson plans as they are more commonly known, must be systematic if the retarded students they are designed for are to have a chance to learn the targeted skills (Mercer & Mercer, 1985). Teachers at times may confuse a well-designed plan with the plan book that is commonly used in public schools (see Figure 7.2). A lesson plan book would be more appropriately called a lesson plan schedule book because the function it serves is to cue the teacher concerning the daily schedule, the location of the students, and the types of activities assigned to the learners. This scheduling procedure is important because it is a quick reference for orderly transitions between activities and events. Lesson plan scheduling should not, however, be confused with the more detailed and systematic process of lesson plan or instructional intervention development.

Developing effective instructional strategies (step 8, Figure 7.1) involves a concise step-by-step process culminating in any one of several formats. Teachers can choose the design that best fits their needs. The necessary components of an

WEEK OF: 3/21-3/25	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Period 1	Reading Group 1 Jim } Brian } Workbook Polly } Pgs. 1-3 Kelly } Oral Sam } Reading	Reading Group 1 Jim } Oral Brian } Reading and Polly } Flash Cards Kelly } Workbook Sam } Pgs. 8-9	Reading Group 1 Entire } Reading Group } Comprehen. Test	Reading Group 1 Entire } Read Story Group } Pg. 5- Basal Ans. Ques. 1-10	Reading Group 1 Jim } Flashcards Sam } Brian } Practice w/ Language Master Polly } Oral Kelly } Reading
Period 2	Math Group 1 Entire } Unit Group } Test	Math Group 1 Fractions } Pg. 81 Practice } (Text) # 1-15 Entire Group	Math Group 1 Howie } Seatwork Jerry } Fractions Sheet Brian } Instruct Polly } Add. Jim } Fractions	Math Group 1 Brian } Workbook Polly } Pg. 30 Jim } Howie } Instruct Jerry } Using Fraction Cards	Math Group 1 Entire } Cooking Group } Exercise Fractions in Cooking
Period 3	Reading Group 2 Jeff } Basal Karen } Reader Cindy } Story II Kevin }	Reading Group 2 Entire } Workbook Group } Pgs. 6-8 Individual Testing	Reading Group 2 Jeff } Sight Karen } Vocabulary Cindy } Same as Kevin } Tuesday	Reading Group 2 Entire } Story 12 Group } Oral Comprehen. Questions	Reading Group 2 Entire } Story 13 Group } Workbook Pg. 10
Period 4	Lunch	Lunch	Lunch	Lunch	Lunch
Period 5	P.E. Planning Period	Math Group 2 Play Construction of Shapes Games	P.E. Planning Period	Math Group 2 Entire } Pgs. 50-52 Group } Workbook	P.E. Planning Period
	Math Group 2 Intro. to } Basic } Entire Geometry } Group	Art Planning Period	Math Group 2 Have Students Locate and Label Shapes Around School	Music Planning Period	Math Group 2 Entire } Unit Group } Quiz

■ FIGURE 7.2

Example of a Lesson Plan Schedule Book

implementation plan, however, are basic, including areas that teachers must address if the plan is to work. These plans can be designed for either group or individual instruction because their components will be the same. Group instruction plans may include modifications of materials and teaching techniques to meet a particular individual's needs.

An effective instructional or lesson plan should include, at least, the following components:

1. Demographic information.
2. Annual goal, short-term objective, and instructional objectives.
3. Preinstructional activities.
4. Teacher instructional behaviors.

5. Activity sequencing and student responses.
6. Probes.
7. Generalization activities.

Demographic Information

Demographic information about the students or the group, the teacher's name, and the date of implementation should be included on the top of the form. Although recording this information may seem trivial, it is important for maintaining an overall management system (see Table 7.2). Omitting dates of implementation and student/group descriptors makes it difficult to keep an accurate record of techniques and materials that were tried and who implemented them so that changes can be made when necessary. For example, a teacher instructing a reading group in the use of comprehension skills such as sequencing and main idea may be attempting to use a new instructional strategy of cueing key words in the story by underlining them. During the end-of-the-year IEP review, it would be helpful to be able to refer to previous instructional plans, noting the techniques that were implemented. The demographic data provides information concerning which students were exposed to the techniques, the dates, and so forth.

Goals and Objectives

In addition to demographic data, initial information should include the annual goal, short-term (IEP) objective, and the day's instructional objectives(s). To save time, a numbered coding system such as the one presented for use with microcomputers provides a quick method for recording goals and objectives (see Table 7.2 and Figure 7.3). For example, an annual goal may involve motor skills, an area which is coded 2.0. One specific short-term objective incorporated within this goal may be to sit in a balanced position for 2 minutes. It can be coded 2.1. Subsequent instructional objectives identified in the task analysis can be coded 2.11, 2.12, 2.13, and so on. Therefore, when teachers develop their daily lesson plans or strategies, it is simple to use the coding system instead of rewriting the same goals and objectives. The coded numbering system can assist teachers in filing plans for later retrieval.

Preinstructional Activities

Preinstructional activities are devices or techniques that a teacher uses to attract learner attention and increase motivation for an immediate task (Table 7.2 and Figure 7.3). Dick and Carey (1978) have suggested techniques such as cartoons or attractive color schemes to engage student attention. In addition, modeling exactly what the task entails or demonstrating to the learner how the current lesson relates

TABLE 7.2 Sample Lesson Plans (Instructional Plans)

Group or Student	Stephanie, Bob, Jerry, Stacy	Date(s)		
Annual Goal:	1.0 (See Table 3.8)	Generalization: Students, with help from parents, find 10 words with consonant blends in grocery store.		
Short-Term Objective:	1.1 (See Table 3.8)			
Instructional Objectives:	1.41, 1.42, 1.43 (See Table 3.6)			
Pre-instructional Activity	Teacher Behavior	Information Presentation and Student Behavior	Materials	Probe
Present pictures of words from story or passage that begin with blends (Ex: frog, street, grass).	Verbal Instructions and Prompts: A. As student attempts word, teacher sounds blends as necessary. Model: B. Teacher reads two sentences from passage. C. Demonstrates process for egg carton activity.	1. Reads orally from passage 2. Shake egg carton. Name a word that begins with the blend that the marble lands on.	Pictures Reading Passage Egg carton with consonant blends glued to bottom/marble	Laminated File Folder: Three columns 1. pictures beginning w/blends 2. blends 3. word endings Student matches picture to correct blend to matching word ending.
Student names picture and points to word written on chalkboard or overhead slide.				

(Prepared by Tina Kinsley)

Group or Student: _____

Annual Goal: _____

Short-Term Objective: _____ (See Table 3.9)

Instructional Objective: _____ Steps of task analysis

Pre-Instructional Activity

Model making toast. Have group eat toast.

Teacher Behavior

1. Verbal Instruction: Give verbal direction for step.
2. Model: Model behavior for step.
3. Prompt: Touch student's hand, then touch item.
4. Guidance: Physically guide student through step.

Information Presentation and Student Behavior

Follow steps of attached task analysis.

Material

Toaster	Napkin
Bread	Knife
Butter	Plate

Probe

Marking percent correct steps completed at independent level.

Generalization

Parents assist in making toast at home.

■ FIGURE 7.3
Sample Lesson Plan (Alternate Form)

to previously learned skills can have a motivating effect. In any case, teachers should plan how they intend to motivate their students.

For example, a severely retarded student may be engaged in learning independent feeding skills. Preinstructional activities could simply involve allowing the learner to taste the food, thereby increasing awareness and motivation. Similarly, for mildly retarded students engaged in a career awareness unit, highlighting potential jobs in agribusiness, a field trip to a farm supply business may provide additional incentives.

Preinstructional activities can also be used to introduce the theme or scope of the lesson. For example, a cartoon may demonstrate to students in a humorous fashion what happens when two people argue. The lesson for that day may concern interpersonal relationships on the job and involve role playing certain vignettes. In this instance, the preinstructional activity was used to "set the stage" for the activity.

Teacher Instructional Behaviors

One of the most difficult tasks for some teacher educators is to assist their students in identifying the behaviors they exhibit in the classroom. When developing lesson plans, some teachers spend a great deal of time outlining specific behaviors they expect from students with little or no attention given to what they themselves do. If this is the case, a vital piece of the teaching puzzle identifying the cause/effect teacher-pupil relationship may be lost. Therefore, antecedent teacher behaviors and their resulting effects on student behaviors must be identified (Table 7.2 and Figure 7.3). For example, some severely retarded students benefit from fewer verbal directions and more physical prompts. Similarly, the teacher may present a complicated vocational task to a moderately retarded student by using primarily modeling with some verbal directions. Both examples have the common element of pinpointing exactly what the teacher will do to elicit a particular student response.

Antecedent behaviors exhibited by teachers are those that occur *before* the student attempts a task and are designed to increase the probability that the learner will perform the skill successfully (see Chapter Six). In the examples given, verbal directions, models, physical prompts, and various forms of guidance are all considered antecedent teacher behaviors. Also, cues that are built into instructional materials (e.g., underlining key words in a paragraph, color coding two parts of an assembly task) can be considered antecedent events.

Manipulating antecedents in a systematic fashion is the core of the curriculum implementation effort. Knowing *exactly* which antecedents are being used helps the teacher in deciding how they affect the progress of students. For example, a teacher using modeling as the primary antecedent for teaching a complex vocational task may need to know the type of model used (e.g., teacher model vs. peer model) for later analysis. If assessment data indicate that the learner makes too little or no progress, knowing the technique(s) used assists the teacher in changing the instructional strategy. This change or revision of instructional methods and materials directly relates to an upcoming component involving the use of probes.

Activity Sequencing and Responses

Presenting a lesson in an organized fashion helps provide structure, allowing teachers to be more systematic in their presentation and allowing students to be more attentive to the antecedents being delivered. By organizing the presentation, the teacher can better control the instructional setting, intervening as needed. This section of the plan (see Table 7.2 and Figure 7.3) involves listing the steps of the lesson in the order that they are presented to the student. In cases where a task analysis is used as an instructional guide (Table 7.3), the steps in the analysis will be the sequence the presentation will follow.

Student responses should be the result of a teacher's manipulation of specific antecedents. (e.g., a teacher prompts a student by touching the student's hand and then touching a knife. The result is that the student picks up the knife.) In this

TABLE 7.3. *Task Analysis for Making Toast: A Domestic Skill*

Short-Term Objective:	Outcome: Making toast.
	Context: Toaster
	Loaf of bread
	Butter and knife
	Criterion: 100% of steps on task analysis over 5 days.

- | | |
|--|---|
| 1. Get out toaster, knife, and napkin. | 12. Pick up knife. |
| 2. Get out bread and butter. | 13. Put butter on knife. |
| 3. Plug in toaster. | 14. Spread butter on toast. |
| 4. Untie bread. | 15. Return bread and butter to storage. |
| 5. Take out one piece. | 16. Return toaster. |
| 6. Retie bread. | 17. Take knife to sink. |
| 7. Place bread in toaster. | 18. Rinse knife. |
| 8. Press lever. | 19. Throw away napkin. |
| 9. Take lid off butter. | 20. Get dishcloth or sponge from sink. |
| 10. Remove toast. | 21. Wipe off table. |
| 11. Place on napkin. | |
-

(Prepared by Tina Kinsley)

section of the instructional strategy, teachers list the specific outcomes they hope to elicit from learners. In the example, the teacher may identify an approximation of the target behavior such as “the student moves hand toward the knife” instead of “the student picks up the knife.” By taking the time to outline the expected student behaviors, teachers can continue to maintain their organizational scheme. When data are reviewed at a later time, all necessary information will be available.

Probes

One important concept for teaching retarded learners that was highlighted in P.L. 94-142 was the requirement for ongoing monitoring of student progress (Bepko, 1981). A common misconception is that “ongoing monitoring” refers to weekly, or worse, semi-yearly or yearly checks. When teaching retarded learners, using only weekly or less frequent checks can be a mistake that will be difficult to correct.

An ongoing monitoring system should be continuous (e.g., at least daily, and in some cases several times daily), so that problems in the instructional system that are impeding student progress can be eliminated immediately (Turnbull, Strickland & Brantley, 1982). For example, if a student who is learning to add on Monday misunderstands a basic concept and practices the mistake all the rest of the week, it will be much more difficult to correct the error. Similarly, a severely retarded student who is engaged in a toilet training program may have made no progress for months. The lack of progress may have been related to the trainer’s inappropriate use of a guidance technique, and the months without progress can never be regained.



An ongoing monitoring system should be continuous—at least daily—so that problems in the instructional system can be immediately eliminated. (Courtesy of Kay Shaw)

Probes are one type of formative evaluation that teachers include in their lessons to measure *small* samples of student behaviors. These probing devices relate directly to the daily instructional objectives(s) and can be as simple as a page from a workbook or the teacher's observation of a student cleaning a sink. For example, an instructional objective that was presented earlier in the chapter involved the diphthong "ów" in different context words. The context of the objective involved the student pronouncing the diphthong in five words representing the first context and five in the second. In this case, the probe might involve flashing the 10 cards at the end of the lesson and recording any errors that were made.

Generalization Activities

A common problem faced by some teachers is developing suitable activities that allow the student to practice newly learned skills under different circumstances.

When designing instructional strategies, practitioners may overlook a problem faced by many retarded individuals. Basically, these students have difficulty in generalizing knowledge and skills to other settings, under the guidance of different persons, or when using alternate materials.

For this reason, teachers must develop a component of their lesson plans to include additional activities that will be used for guided practice. When teaching discriminations between object sizes, the teacher would not stop when the student learned the initial differences in size. Rather, the teacher would vary the number and types of objects as well as requiring more precise discriminations. Similar examples can be noted for teaching most academic skills.

Consider developing an instructional strategy for teaching the basic operation of addition. Traditionally, teachers begin by explaining the basic concept to the student while modeling the target behavior. The student is then instructed to practice the target outcome by completing a predesigned worksheet or a page in a workbook. Unfortunately, instruction and guided practice often end here.

Students in the general population can often transfer what they have learned to daily occurrences outside of the school. Mentally retarded learners, however, are not always able to make that transition. Therefore, teachers could delineate activities such as using a grocery store advertisement to work on addition practice or incorporating computation problems into a community field trip. When developing new lessons, teachers must consider alternate activities that allow learners to practice their skills in real-life situations.

Dick and Carey (1978) have discussed follow-through activities that essentially are programming for generalization. Such follow-through activities include remediation and/or enrichment materials. These materials are supplemental, in that they are gathered by the teacher for possible use by the student. Therefore, the plan states that they are to be used to assist the learner in guided practice activities (e.g., group projects, activity centers, practice with microcomputers, boardwork, practice in workbooks, instructional games).

FORMATIVE EVALUATION

The process that uses student progress as a measure of program success is called *formative evaluation* (step 9, Figure 7.1). In a strict sense, formative evaluation is a method of field testing units of instruction during the design process to “iron out” difficulties before implementation (Gagne & Briggs, 1974). For example, when developing a task analysis for riding a bus, the teacher would field test the sequence before beginning to train retarded students in this skill area. A formative evaluation of this task analysis might be to have a group of regular students complete the steps in the sequence, noting any difficulties they might encounter. Subsequent revisions of the task analysis would include corrections based on observed difficulties and feedback from the students who participated in the trial sessions.

However, the principles of formative evaluation can also be applied to daily instruction. Teachers may design instructional components, implement the lessons, and make certain assumptions that the intervention was successful. Subse-

quently, the instruction will be implemented again in the same or a similar fashion. The resulting transmission of knowledge and/or skills is speculative. By incorporating some type of formative evaluation into their educational programs, teachers can make judgments based on data relative to the efficiency and effectiveness of the instruction. With this information on student performance in hand, teachers can revise their interventions whenever and wherever needed, increasing the probability of student success.

In this chapter, formative evaluation has been presented in the form of daily probes. These daily probes are based on the instructional objective and measure whether or not the learner has met the desired criterion. If the criterion has been met, the teacher can assume that the initial instruction was successful and subsequent guided practice activities can be implemented. The student can then advance to the next objective. Conversely, if the student has not met the desired criterion, the teacher can assume that a revision is needed in the instructional materials and/or techniques. Subsequent alterations in the intervention can be monitored until the desired result is obtained. Chapter Four on assessment has presented this process in more detail.

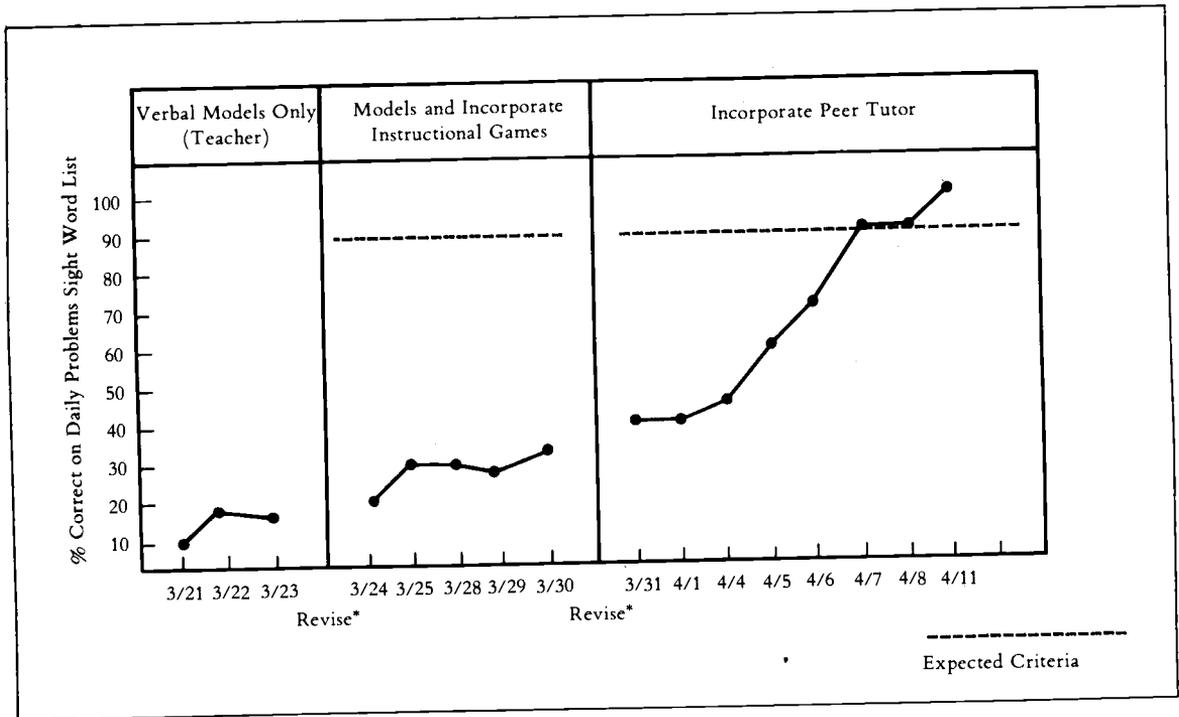
Revising Interventions

Historically, when retarded learners failed, the blame for the failure was placed on some inherent quality of the student. Professionals now believe that when learning problems occur energies must be exerted toward matching the appropriate methods and materials to learner needs. Therefore, the principle of revising interventions becomes critical. Formative evaluation provides teachers with the structured data needed to make decisions about revision (step 9a, Figure 7.1).

The ability to make appropriate decisions concerning changes in the instructional system is dependent upon the ease of analyzing the data collected. To minimize poor decisions, teachers may consider adopting a measurement tool that will assist them in collapsing data into a workable, easy-to-read format.

One tool for information collection is charting data in graphic form (see Chapter Five). Our society has become visually oriented, and often a picture of something can aid our understanding. Also, by charting certain learner behaviors, teachers find that they can prevent valuable information from being lost in the daily events of the classroom. When student behavior is charted, a picture emerges depicting whether or not specific goals are being met. The graphic display presented on the chart should indicate when revisions are necessary. In addition, when the charted behavior is analyzed after a new method or material has been implemented, the data displayed should indicate whether or not more changes are needed.

The cause-and-effect relationship between an educational intervention and learned behavior is the key to the effectiveness of a program. Therefore, a visual display of these cause/effect relationships can be a useful tool. Figure 7.4 presents an example of how the academic progress of a mildly retarded student can be charted. The criteria expected and the criteria achieved on instructional objectives



■ FIGURE 7.4
Program Revision Based on Formative Evaluation Data

can be displayed to assist in analyzing learner progress. At the point of continued low performance by the student, the teacher can intervene by revising methods and materials to assist the learner in mastering the task. Charted information is also beneficial for viewing the worth of larger units of study. Analysis of component parts and the unit as a whole is important to establish the value of a program. Teachers can revise any number of program components including teacher behaviors, instructional materials, and the objectives for the program.

SUMMATIVE EVALUATION

The short-term objectives found on a student's IEP are actually large chunks of instruction that can take many months of time to teach. In many cases, teachers have considered short-term objectives to be those that are the cumulative effort of a unit of instruction. Summative evaluation involves gathering information concerning student performance at the completion of a unit that will assist in assessing the overall effectiveness of instruction (step 10, Figure 7.1).

Three types of data can be compiled for analysis in this final phase of evaluation: direct product data, observational data, and learner input. Measurement of direct products can take different forms such as standardized or criterion-

referenced tests for academic skills and completed projects for vocational or leisure skills. For example, a short-term objective for a unit on addition could state:

Outcome: Student will correctly compute addition problems at all levels up to carrying in alternative places.

Context: 35 problems—written worksheet.

Criterion: 80%–90%.

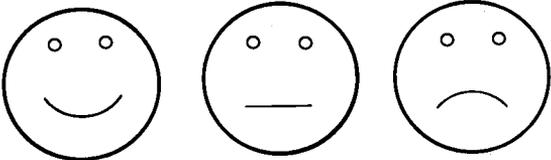
For many mildly and moderately retarded learners, this objective comprises a large unit of instruction that may span several weeks. Subsequent analysis of this objective by the teacher could identify a number of instructional objectives that will be taught daily, leading to the completion of the unit (see Table 7.1). The summative evaluation of the unit, therefore, is simply the testing situation outlined in the short-term objective. The information gathered can then be analyzed, with the teacher noting whether the students have mastered that unit and thereby allowing them to proceed to the next unit of instruction.

Another example of a direct product measure is teaching leisure-time activities to moderately or severely retarded students. A short-term objective may be concerned with a needlepoint project, describing the criteria needed for its completion. Instructional objectives are identified and taught, resulting in a finished needlepoint project. The teacher can then evaluate the project according to preset criteria, judging the effectiveness of that unit.

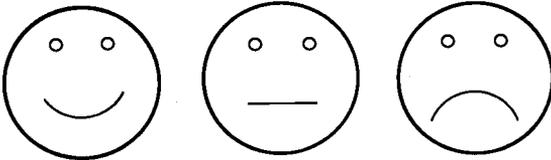
Using observational data as a tool for evaluation is a vital component of assessing mentally retarded learners. As with all techniques of evaluation, observation should be used throughout the system. For example, when teaching self-care skills, the teacher observes the students as they perform the outcomes stated in the short-term objectives (e.g., toileting), carefully noting performance on each of the instructional objectives identified in the task analysis. Similarly, teachers can intervene (or teach) and subsequently observe the results of programs designed to teach social behaviors. For example, if a student continuously interrupts the conversation of others, the teacher may have to measure the number of occurrences defined as interruptions by observation and design a program to reduce the frequency of that behavior. Subsequent observations of the student's interrupting behavior will provide the teacher with data concerning the effectiveness of the behavioral program.

The final method of gathering summative evaluation data involves obtaining learner input. Professionals should give more credence to the opinions of their consumers. Teachers can sample their students' opinions using interviews or questionnaires. For younger learners, questionnaires that incorporate a choice of happy faces work well (Figure 7.5). Older mildly retarded students frequently respond to "comments" sections on materials that allow them to make statements concerning their value. Moderately and severely retarded learners can often communicate in a brief interview their impressions of certain units. Some people may feel that retarded learners have few opinions and will progress best when parents and professionals design programs and make key decisions. Paternalistic attitudes

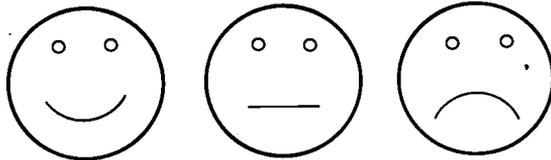
1. Was the reading game fun?



2. Do you like the word cards?



3. Does the teacher make you feel good about your work?



■ FIGURE 7.5
Example of Student Feedback

such as these are contrary to the current philosophy of assisting the retarded in being as independent as possible. Making an effort to incorporate student feedback into program evaluation is a small step, and yet it may well be the first step in training for varying degrees of independence.

Additional Summative Evaluation Data

Step 10 of Figure 7.1 indicates a vital component of summative evaluation in relation to retarded learners. This assessment component can be used effectively as the means to observe whether or not students are generalizing skills to community situations. For example, when teaching mildly retarded students units on basic operations in arithmetic, teachers may include in their generalization activities tasks that involve some practice with realistic community tasks (e.g., newspaper ads for grocery stores). The summative evaluation for operations in arithmetic, then, might find students using the basic operations for comparison shopping,

vocationally related applications, and other daily living tasks in the community setting. In the case of the bus-riding component of community mobility, the example is simple: the summative evaluation involves observing the students move independently to different parts of the community.

In addition to these community applications, summative evaluations can also include many of the same techniques used in the community needs assessment. Specifically, a follow-up of former students allows teachers to rate the relative success of their curricula and implementation strategies. For example, a problem may be indicated if a large proportion of moderately and severely retarded students are leaving a secondary public school program only to enter a sheltered workshop. A situation such as this may be the result of a lack of community training sites or a lack of generalization activities built in to daily lessons. In any case, the results from the summative evaluation do indicate that the independence of these learners is minimal and further analysis is warranted.

Summative evaluation is the final step in the instructional design process. The techniques of summative evaluation are essentially the same as those used during the formative evaluation process and during initial assessments. In this final evaluation, teachers may find it useful to analyze the system as a whole. In this way, additional information that may have been inadvertently lost during ongoing assessment can provide teachers with a more complete analysis of student progress and program effectiveness.



KEY CONCEPTS



This chapter has attempted to present the reader with a view of curriculum design as a process; that is, a mechanism that is ever changing and relates entirely to individual learners. Viewing curriculum as a process differs from the prevailing practices that regard curriculum as merely a set of outcomes. For example, teachers who practice the process of instructional development are able to assess the needs of any retarded learner, regardless of functioning level, and design appropriate curriculum options for that learner based on identified strengths and weaknesses. Conversely, teachers who perceive curriculum only as a set of outcomes often attempt to identify a preset curriculum, “fitting” the student into established goals and objectives and disregarding individual learner needs.

- The age of the learner, prerequisite skills needed, community validity of the skills, and the availability of resources to teach the skills are all important considerations when establishing the order in which skills are to be presented to learners.
- Translating short-term objectives from the IEP to instructional objectives (IIP) is accomplished by using the process of task analysis.
- Some steps on a skill sequence require the teacher to write out a formal objective including outcome, context, and criterion. Other steps, such as those involving self-care skills, are sufficiently concise (e.g., pick up toothbrush) without a formal objective.

- Educational interventions are well-designed lesson plans that include demographic information about the learners, goals and objectives for the lesson, preinstructional activities to catch the learner's attention, teacher instructional behaviors, sequence of activities and student responses, probes to monitor student progress, and generalization activities to help students practice new skills under different conditions.
- Formative evaluation includes trying out lessons on others before the skill sequences are presented to retarded learners. This technique helps to "iron out" the problems and increase the probability for learner success.
- Another component of formative evaluation is included in the implementation of instructional strategies (lesson plans). Probes provide teachers with frequent information about student progress that is used to revise the strategies as needed.
- Summative evaluation measures student progress over large chunks of instruction and monitors the effectiveness of the curriculum by following student progress in relation to community-realistic tasks.

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TEACHING FUNCTIONAL READING AND WRITTEN EXPRESSION

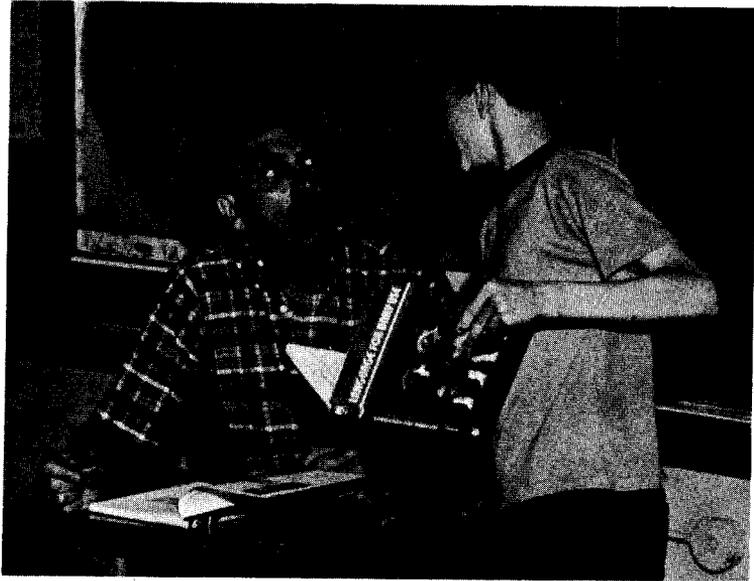
■ Instruction in reading and other language arts skill areas has been given considerable attention in most curricula for mildly and moderately retarded students. Professionals have felt that mildly retarded students could learn to read but would fall behind in achievement levels, possibly attaining third or fourth grade reading skills. Moderately retarded learners have been thought to be capable of reading cautionary words, with little need for moving beyond that level.

Written expression has been generally overlooked in curricula for the moderately retarded, while mildly retarded learners have been expected to master the spelling of basic words and construct basic sentences. Unfortunately, these approaches set artificial limits on students who have proved to be heterogeneous.

BASIS FOR READING AND LANGUAGE ARTS INSTRUCTION

Reading and language arts programs for retarded students should be developed according to individual needs. A mildly retarded learner may be capable of learning to read books requiring fourth grade reading skills. Conversely, a moderately retarded learner, because of severe auditory processing deficits, may be able to learn large numbers of community-valid words using a sight approach, but not be able to achieve a second grade skill level as assessed by standardized reading tests.

The basis for developing reading and written expression activities for any capable retarded learner is the *functionality* of the skills being taught. For example, a mildly retarded learner may be able to read on a third grade level using a basal book, but may not be able to read and follow the directions accompanying a power tool. Similarly, moderately or severely retarded learners may be able to read



Language arts activities can be a bridge between reading and written expression. (Courtesy of Kay Shaw).

cautionary words when they are presented in the classroom, but may not be able to act appropriately in community situations when confronted with the same words.

The major reason for teaching retarded learners reading and language arts skills is that these skills can help them to be more independent in home, work, leisure/recreation, and other community environments. If some professionals have not been successful in teaching these students useful reading and language arts skills, it may be due to their use of general education curricular approaches presented at a slow rate (Blanton, Sitko, & Gillespie, 1976). The academic curriculum for regular education, although accurate in scope and sequence of skills (i.e., the order in which skills are generally learned), generally does not emphasize application of the skills to community problems and situations.

Special educators can use basically the same scope and sequence of reading and language arts skills to teach retarded learners, but the diagnosis of reading deficits and the methods of instruction must be more precise than those used with their nonhandicapped peers. Also, special educators should combine the teaching of the basic skills with the immediate application of those skills to community situations (e.g., finding words in the community that are examples of certain decoding rules).

This chapter provides teachers with an overview of the preferred practices for teaching reading and written expression skills to retarded learners. The skills and techniques presented here apply mostly to mildly and moderately retarded learners, although some severely retarded learners can also benefit from a program that teaches reading of functional words. As with the other chapters in this half of the text, the material will be presented in terms of the curriculum development process

discussed in Chapter Three. Readers may wish to return to that chapter and review Figure 3.2 before continuing to the next section.

READING AND WRITTEN EXPRESSION: THE IEP

Steps One and Two: The Community Needs Assessment (CNA)

Conducting a CNA allows teachers to immediately place reading and written expression skills in the context of the community. The information gathered during this exercise should help in designing long-term goals that reflect application of basic skills to activities in home, vocational, leisure-recreation, and other community environments. Conducting a CNA may also assist teachers in finding volunteers and community sites where academic skills can be practiced in more natural settings (e.g., shopping malls, employment offices).

Table 8.1 presents a partial list of community settings where reading and written expression skills may be used and practiced. Once these settings have been identified, teachers can organize the information into “subenvironments,” depending on the type of skills required (Brown, et al., 1979). For example, the reading and written expression skills required for locating and recording information about jobs from a job board may be somewhat different from those required for filling out an application. Both of these settings may be located at an employment agency, yet they can be considered separate subenvironments.

TABLE 8.1 Partial List of Potential Community Environments Where Students Can Use Reading and Written Expression Skills

<i>Community Environment</i>	<i>Related Reading and Written Expression Skills</i>
Fast food restaurants	Sight words from an over-the-counter menu
Family restaurants	Sight words from individual menu
Grocery stores	Sight words on store items Sight words on signs Check writing skills
Employment agency	Reading job notices Filling out forms Developing a resumé
Public library	Locating and reading books and magazines Listening to and visually following talking books Researching and summarizing in writing information about various topics
Home	Reading a newspaper Reading directions for assembling items, cooking, and cleaning Writing letters and cards Expressive writing for pleasure

Step Three: Identifying Potential Annual Goals

Potential annual goals for reading and written expression can be identified on two levels. The first level deals with the basic skills identified in scope and sequence charts, while the second level identifies the application of these skills to the community. Based on skills listed in Figure 3.5 (Chapter Three) and on skills suggested by other authors (Bender & Valletutti, 1982; Mercer & Mercer, 1985; Radabaugh & Yukish, 1982; Stephens, Hartman, & Lucas, 1983), the following is a partial list of potential annual goals at both levels. This list should provide teachers with starting points for developing their own reading and written expression curriculum.

READING: LEVEL 1

Decoding

Mildly Retarded

1. Identifies and pronounces blends commonly found in words at the first, second, and third grade levels.
2. Identifies and pronounces consonants when found in the initial, medial, and final positions in words.
3. Identifies and pronounces both short and long vowels when found in words.
4. Identifies and pronounces digraphs and diphthongs when found in words at the first, second, and third grade levels.
5. Identifies and pronounces root words, prefixes, and suffixes.

Moderately and Severely Retarded

1. Recognizes and pronounces a variety of functional community-valid words using a whole word memorization approach.

Comprehension

Mildly Retarded

1. Demonstrates the meaning of a wide variety of words.
2. Locates and describes the main idea of a story and can recall details.
3. Follows written directions.
4. Sequences events in logical order.
5. Makes basic inferences and evaluations.

Moderately and Severely Retarded

1. Demonstrates the meaning of words by acting appropriately when confronted with a wide variety of community-valid vocabulary (e.g., "danger," "push").
2. Follows some written directions with adaptations.
3. Makes basic inferences and evaluations based on listening comprehension skills.

READING: LEVEL 2

Mildly Retarded

1. Locates basic information about subjects using source books, manuals, encyclopedias, dictionary, etc.
2. Uses maps to arrive at intracommunity and intercommunity locations.
3. Assembles objects using written directions.
4. Demonstrates reading skills used in a variety of home, work, leisure/recreation and other community settings.

Moderately and Severely Retarded

1. Demonstrates the meaning and acts appropriately when confronted with a wide variety of community-valid skills.
2. Locates, reads, and acts appropriately in relation to key words found in the context of recipes, menus, directions on labels, etc.

WRITTEN EXPRESSION: LEVEL 1

Spelling, Handwriting, Composition

Mildly Retarded

1. Spells consonant and vowel sounds correctly both out of context and in the context of words.
2. Spells a variety of phoneme/grapheme groups both out of context and in the context of words.
3. Uses dictionary location skills in spelling.
4. Demonstrates match-to-sample manuscript writing skills (e.g., use of visual models).
5. Demonstrates match-to-sample cursive writing skills (e.g., use of models).
6. Arranges words in logical order to form sentences.

7. Writes simple answers to questions.
8. Dictates a story.
9. Writes a short paragraph on a topic.
10. Demonstrates the correct use of punctuation.

Moderately Retarded

1. Spells own name and names of significant others correctly.
2. Spells correctly a variety of community-valid sight words.
3. Writes name in both manuscript and cursive.
4. Writes a variety of words using either manuscript or cursive.
5. Dictates short stories.
6. Dictates directions and explanations of witnessed events.

WRITTEN EXPRESSION: LEVEL 2

Mildly Retarded

1. Writes name, address, and other personal information.
2. Fills out employment, bank, and other applications.
3. Writes brief letters of complaint.
4. Writes personal letters and thank you notes.
5. Lists activities that need to be accomplished.
6. Records brief directions.
7. Records notes concerning job descriptions or community activities.

Moderately Retarded

1. Carries a card containing personal information and can transcribe the information onto other forms.
2. Writes brief personal letters and thank you notes.
3. Lists activities that need to be accomplished.
4. Records brief directions.

These examples of goal statements are a starting point for teachers, who can add to the list as dictated by the needs of their students.

Step Four: Translating Goals into Potential Short-Term Objectives

For goals to be translated into potential short-term objectives, the student outcomes must be described in measurable terms. Teachers have two choices concern-

ing the types of objectives they wish to write in relation to academic or basic skills. First, objectives can be written in a more traditional fashion, reflecting skill performance in classroom activities. For example, the following objectives represent two classroom based skills.

Outcome: The student will locate an answer in the body of a story, reading it as proof to a question asked by the teacher.

Context: Story chosen from basal reader (second grade level).

Criterion: 5/5.

Outcome: The student will write basic explanations to questions asked by the teacher.

Context: Oral questions asked by the teacher.

Criterion: Explanations must include relevant details and sequential ordering of ideas. Product judged by the teacher.

The second approach involves restructuring the objective by either using community-valid materials or requiring the student to perform the skill in a community environment. In this instance, the objectives can be altered to reflect the following:

Outcome: The student will locate an answer in the body of a story, reading it as proof to a question asked by the teacher.

Context: Stories from newspaper articles.

Criterion: 5/5.

Outcome: The student will write basic explanations to questions asked by an employment counselor.

Context: State and private employment agencies.

Criterion: Explanations must include relevant details and sequential ordering of ideas. Product judged by teacher and employment counselor.

A general rule of thumb concerning the type of objectives to write generally concerns the age or functioning level of the students. Older or higher functioning students should move quickly toward practicing reading and written comprehension skills in community environments using community-valid materials.



KEY CONCEPTS



- Placing artificial boundaries on groups of students may either hinder the growth of some or set unrealistic goals for others. Therefore, one yardstick to measure whether a set of skills is appropriate for a given learner is to judge the functionality of the skills in relation to life in the community.
- Reading and written communication skills can often be taught more effectively in relation to a person's role as a consumer, worker, citizen, and individual.
- A community needs assessment for reading and written expression skills involves a careful examination of the types of behaviors important for community integration.

For example, a teacher may analyze a number of grocery stores to identify words a student must know to become an independent shopper.

- Potential annual goals allow the teacher to establish an appropriate scope and sequence of skills for presentation to the learner.
 - Potential short-term objectives are subskills that lead to mastery of one or more goals. Because they are measurable, teachers can use these objectives as yardsticks against which a student's present level of performance is compared.
 - Whenever possible, short-term objectives should reflect the application of academic skills to community-valid activities.
-

Step Five: Assessing Student Entry Behaviors

Before teachers can adequately develop teaching techniques designed to improve reading and written expression skills, a thorough analysis of each learner's strengths and weaknesses must be conducted (Ekwall, 1985). When a new student enters the class or prior to a student's placement in special education, teachers will conduct a survey-level assessment pinpointing general deficit areas. For mildly retarded learners, teachers have available a wide range of commercially produced tests that provide information on reading level, decoding, reading comprehension, word usage, spelling, handwriting, and other areas (see Table 4.1, Chapter Four).

Specific assessment of reading and written expression skill levels involves proving that what has been found at the survey level is, in fact, true (Howell & Kaplan, 1980). In addition, specific-level assessment information allows teachers to pinpoint the exact areas where deficits are occurring (Rupley & Blair, 1983). For example, a teacher may discover that a student is having difficulty on the passage comprehension subtest from the Woodcock Reading Mastery Test (Woodcock, 1973). An analysis of the student's responses on this subtest may provide some clues concerning specific problem areas; however, no one commercially produced test can be expected to provide thorough coverage.

The teacher's job is to look at a scope and sequence chart for comprehension and then use a commercially produced criterion-referenced test or develop teacher-made tests that will answer the question, "How does the student fare on each reading comprehension subskill?" One commercially produced criterion-referenced test that appears to be gaining in popularity is the Brigance Diagnostic Inventory of Basic Skills (Brigance, 1977). This instrument is one of the most thorough of tests, and it can provide the teacher with a complete breakdown of how the student performs in areas such as recall of facts, main idea, inference drawing conclusions, and all subskills of reading comprehension.

Teachers can also perform specific-level assessment by using more informal methods such as teacher-made tests, graded word lists, and informal reading inventories (e.g., Woods & Moe, 1985). The key is that, whatever area the teacher is interested in testing, the items used are based on objectives from a scope and sequence chart.

TABLE 8.2 *Error Analysis Chart Including Examples of Reading and Written Expression Problems*

<i>Stimulus</i>	<i>Student Response</i>	<i>Assumed Cause for Problems</i>
hat	hot	Substituted medial vowel
learn	learned	Changed word ending
grown	gown	Omitted letter
pave	pmave	Added letter
was	saw	Reversed letters in word
cake	sake	Poor sound discrimination—consonant variant
balloon	ballon	Poor sound discrimination—digraph
put	put	Poor sound discrimination—diphthongs
The boy went to the store and then to the movies. Where did the boy go first?	To the movies	Inappropriate sequencing of events
Writing I'm going to the barn. The boy ran home.	Writeing im going to the barn	Improper formation of derivatives Improper use of punctuation and capitalization Spacing problems when writing manuscript letters

Whether information is gathered from survey or specific levels of assessment, its value depends on how it is used by teachers. The best information concerning a student's present level of performance is obtained when an error analysis is conducted. This task, discussed in Chapter Four, involves recording the response the student should have made, the response that was actually made, and an assumed cause for the error (Howell & Kaplan, 1980). An error analysis can provide the teacher with the specific data needed to develop appropriate teaching strategies (See Table 8.2).



IDEA FILE



Following are suggestions for developing a sequence of tasks designed to obtain a reading profile of a learner:

- Gather multiple samples of reading passages (varied lengths) and organize them at different grade levels. (You may need to conduct a readability sample of the passage to establish its grade level. Consult any reading textbook for readability formulas needed to accomplish this task.)

- Using either standardized or criterion-referenced methods, establish the easy, instructional, and frustration levels (grade equivalency) of a student. By establishing these levels, it becomes easier to locate materials for future use (e.g., for instruction and leisure reading).
- Gather commercially produced graded word lists or develop your own that can be used to assess the sight vocabulary or the "out-of-context" word recognition skills of learners. Organize these according to grade levels.
- Obtain scope and sequence charts in reading and translate the goal statements into behavioral objectives. A correctly written behavioral objective will dictate how the skill will be assessed (Stephens, Hartman, & Lucas, 1983).
- Use more than one method to sample a particular reading skill. For example, Howell and Kaplan (1980) suggested sampling reading comprehension by applying four survey assessment techniques: questioning, paraphrase, the cloze procedure, and the maze procedure. For reasons that these authors carefully delineated, the use of only one procedure severely limits the quality of information received by the teacher.
- Periodically practice recording student responses so that the loss of information will be kept to a minimum. When a student is reading a passage aloud, the teacher should have a copy of the passage, marking *both* the stimulus and the actual response made by the learner (e.g., stimulus = "b a t t l e," response = "b o t t l e").
- Perform an error analysis as the data are collected. Howell and Kaplan's (1980) system, presented in Chapter Four, is a good example. Organize data into a column for the *stimulus* (what the student should have read), a column for the *response* (what the student's actual answer or response was), and a column for assumed causes (what the teacher thinks the problem is). A system along these lines assists the teacher in organizing data for decision making.

The reading ability of most moderately and severely retarded learners can best be assessed using activities that relate to independent living skills. Most of these students appear to learn best when presented words in the context of everyday community activities (Snell, 1983). The assessment approach dictated by this system involves asking students to read high-utility words commonly found in the community. The question teachers should answer is whether the words chosen should be presented out of context (e.g., flashcards) or in community situations. Moderately and severely retarded students may not be able to read the word "McDonalds" when it is presented on a flashcard, but they may recognize the word when it is seen in the presence of its discriminative stimulus, "the Golden Arches."

Since a large majority of words most important to these students are functional to community life, assessment should occur, as often as possible, in community-based activities. For example, a teacher could have a predetermined list of words commonly found in grocery stores. During a trip to the store the teacher could point out key words to learners, asking them to read each word.

After each trial the teacher would record whether or not the word was read correctly.



CASE STUDY



“Mr. Jackson, could you do a reading workup on Robbie? He’s next on the waiting list for possible EMR placement, and we need a reading level on him.”

“Now Mrs. Root,” said Mr. Jackson, “I know as the Special Education Coordinator you have to expedite matters. It’s just that reading levels alone provide insufficient information about Robbie’s present level of performance. If he’s having enough trouble to be considered for EMR placement, then I can tell you without a test that he will be reading far below his peer group!”

“Well, what do you suggest?” said Mrs. Root.

“First, I would administer the Woodcock Reading Mastery Test for two pieces of information. This diagnostic test will tell me not just one reading level but Robbie’s easy, instructional, and frustration levels so we can choose the most appropriate materials for use with him.

“If I closely observe Robbie while he takes the test, I can learn a great deal about his learning style. For example, if he’s not a risk-taker, it will show up in his reluctance to answer questions. Also, when I score the test, I’ll isolate his errors and analyze them so that I can make decisions about what to do next.”

“You said ‘first.’ How long will this assessment last?” frowned Mrs. Root.

Mr. Jackson tried his most disarming smile, “Not long. The second phase involves a close inspection of the areas of concern that show up on the Woodcock. If I find an indication of serious deficits in decoding, I’ll want to use a more detailed criterion-referenced test to pinpoint the exact deficit areas, for example, an inability to blend consonant-vowel-consonant. When I’m done I’ll be able to write a fairly detailed list of Robbie’s strengths and weaknesses in reading.”

“Well, it certainly sounds thorough, but it sounds like a lot of time and energy when you can just give a quick achievement test.”

“It will take longer”, sighed Mr. Jackson, “probably about 3 to 4 hours. The result, though, will be a solid workup that allows us to design the best reading program for Robbie. Besides, the time invested now will save time later, because it’ll be much easier to program for Robbie once his strengths and weaknesses are known.”

“Hmm,” said Mrs. Root pensively, “save time later. OK Mr. Jackson, I like the idea. Grab your Woodchuck Test!”

“No, no, Mrs. Root, that’s W O O D C O C K!”

Assessment of written expression can actually encompass several areas including mechanics of writing, handwriting, and spelling (Cohen & Plaskon, 1980; Hammill & Poplin, 1982). Specific level assessment of written expression can cover areas such as capitalization, punctuation, written composition, and creative ex-

pression (Mercer & Mercer, 1985; Moran, 1983). Written samples of the student's work can be obtained and analyzed for errors in the same areas (Poteet, 1980; Weiner, 1980).

Specific level assessment of handwriting involves analyzing samples of the student's writing assignments. (Student writing samples can be used to assess written expression, handwriting, and spelling.) The ability to write legibly is the functional goal; therefore, assessment of a student's handwriting can encompass six areas: letter formation; letter size, proportion, and alignment; spacing; line quality; slant; and rate (Graham, 1983; Mercer & Mercer, 1985).

Spelling is closely related to reading, and much of its specific-level assessment information can come from reading exercises completed by the students. An error analysis of spelling errors should result in a clustering of words related to certain patterns. For example, Polloway and Smith (1982) identified several error patterns such as adding unneeded letters to words, omitting letters, reversals, mispronunciations, and final consonant changes.

Microcomputer software now exists that can assist teachers in analyzing student spelling errors. Hasselbring and Crossland (1982) and Hasselbring and Owens (1983) have developed programs that present learners with a word list given via a computer-driven cassette recorder that allows the students to type in their version of the words. The computer then scores the responses and provides the teacher with a printout listing the student's mistakes and the types of error patterns made.

PROGRAM IMPLEMENTATION

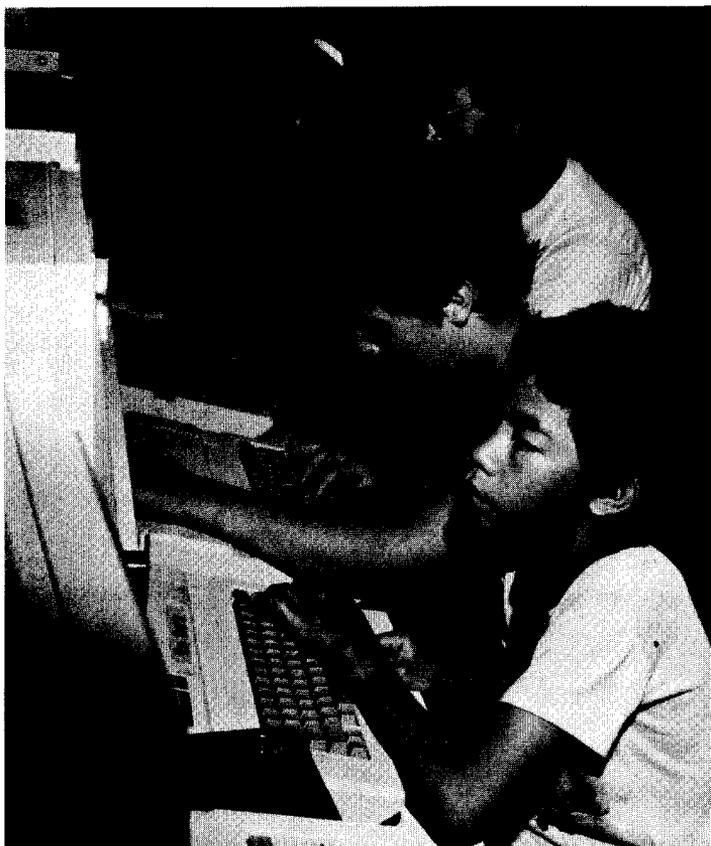
Identifying and Analyzing Short-Term Objectives

Short-term objectives are easily identified if a thorough list of student strengths and weaknesses has been delineated. The short-term objectives relate to the list of weaknesses, where each weakness can become the content for an objective. For example, a student who has a deficit (weakness) in the use of digraphs might have a corresponding objective such as the following included on his IEP:

- Outcome:* The student will read both in- and out-of-context "ch" as an ending sound.
- Context:* Flashcards with words including "ch" or with only the "ch" written on the card.
- Criteria:* 10/10 different words.
10/10 times "ch" is presented independently.

In this case, the analysis of this short-term objective would be a list of words with the "ch" ending (e.g., "church").

Another example might be for a severely retarded learner who, when assessed, was unable to read any words on various fast food menus. A corresponding short-term objective might be as follows:



Computers can be a motivating factor when learning written expression skills. (Courtesy of Kay Shaw)

Outcome: The student will read five basic words from a fast food menu.

Context: At three different restaurants that primarily serve hamburgers.

Criterion: 100% of the trials.

The task sequence of this objective would also be the listing of the key words, for instance, “hamburger”, “fries”, “cola”, “ketchup”, “cheese.”

Developing Instructional Strategies

A major consideration in teaching reading and written expression to retarded learners is basing the instruction on each student's needs. Because of their strengths and weaknesses in auditory, visual, and kinesthetic modalities, different students

may require programs that meet specific learning styles. This is contrary to the approach some teachers take when they include all students in one reading series. For example, mildly retarded learners may continue to fall behind in a mainstreamed situation if the teacher uses only one basal series. The series may require good auditory perception skills on the part of the learner, a problem area for many retarded students. Teachers should review many possible approaches and programs, deciding which individual program or combination of them is the best match with each student's needs.

Phonetic Analysis Approach

The phonetic analysis approach involves recognizing new words by identifying sounds when presented with their corresponding printed symbols, sometimes called the grapheme (symbol)-phoneme (sound) relationship. Phonetic analysis (word attack or decoding) is one of the chief and most useful methods for teaching nonhandicapped students. Basically, students are taught that letters representing sounds can be blended together to form new words, an approach termed "cracking the code."

Unfortunately, the auditory perception deficits suffered by many retarded learners make instruction by this method a difficult task. Retarded learners can use decoding skills to learn new words, but they generally require additional methods (Kirk, Kliebhan, & Lerner, 1978). Retarded learners can acquire decoding skills if they are presented in smaller doses using words that are more controlled and follow set rules (Chall, 1967).



IDEA FILE



A number of ideas for teaching decoding skills can be found in a variety of reference books. The following list is a representative sample to help teachers begin their idea file.

- Decoding training can begin after the student can discriminate between environmental and some letter sounds.
- Decoding skills taught out of context should be immediately generalized to reading words in sentences.
- The sounds of initial consonants can be paired with pictures of objects whose names begin with the same sound (e.g., b = bat).
- Before new words or stories are introduced, the new sounds that are included should be highlighted. Color coding new sounds may help the students associate the sound with the color. Once the sound has been learned, the color can be faded.
- Introducing rules to retarded learners often serves to confuse them and hinders them from using the decoding skills. Color coding can better be used to show how the blend shows up in different words.

- Organizing the sounds and blends into groups with similar characteristics can help retarded learners generalize at a faster rate. For example, “an” and “at” can be paired for presentation showing the student that by changing an initial consonant new words can be formed (e.g., “pan,” “tan,” “man”).
 - Retarded learners often have difficulty blending individual sounds to form a word even if they recognize the sounds. What may occur is that they “break down” on the first sound or syllable and repeat the sound or syllable many times. The Language Master™* may be helpful in assisting students to overcome this problem by allowing them to see the sounds printed on a card and hear the model pronounce the blends. Color cues can also be added to the cards to facilitate learning.
-

Basal Reader Approach

Basal readers are major components of many reading programs. Teachers like basal series because they are structured, have organized teacher manuals listing objectives and supplemental activities, and are self-contained in the sense that all necessary materials needed to conduct the lessons are generally included. There are also several disadvantages of basal readers, as noted by Mercer and Mercer, (1985). Using basal readers in a preset fashion limits a teacher’s willingness to develop innovative activities. Also, basal series are designed for group instruction, and although they are efficient, they tend to overshadow the needs of the individual.

One major disadvantage of using basal readers with mildly retarded learners involves the scope of material presented in a given lesson. Many basal series present multiple objectives within one lesson with some practice on the objectives in subsequent lessons. For retarded learners, especially those trying to keep up with a group in a mainstreamed situation, too many objectives in a presentation may be overwhelming. Basal readers can be an effective teaching tool with mildly retarded students, however, if teachers emphasize one or two objectives and develop many different types of supplemental activities. These supplemental materials allow students the variety of practice they need on fewer objectives. As the objectives are mastered, new ones can be added to the list.

This approach adds another dimension to basal readers by using only those parts of the lessons that relate to the target objectives. Group instruction can and should be used, except that grouping is based on similarity of objectives across students, not on reading level. Grouping can also be flexible, changing as the students begin to master objectives.

Language Experience Approach

The language experience approach attempts to stimulate language as an impetus for teaching reading. In this system, the student’s experiences are used as the basis

*Language Master is a trademark of Bell & Howell, Inc.

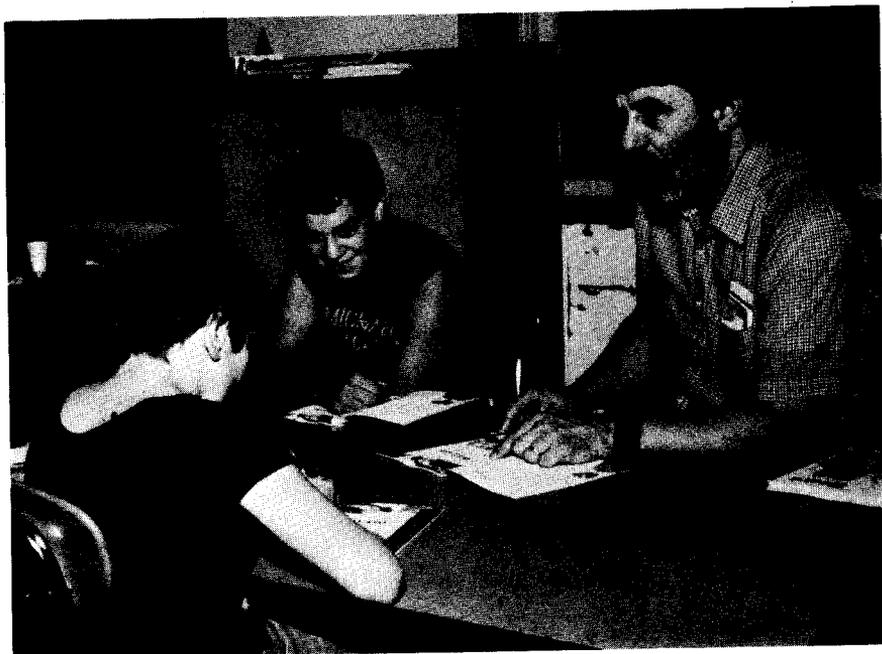
for the reading material. Students who can write put their stories on paper, and those who are unable to write present their stories orally to be transcribed by others.

The effectiveness of this approach with retarded learners is reduced by its emphasis on recording of experiences since the experiences of many retarded learners are limited and they tend to have deficits in oral language. As teachers begin involving their students in more community based training activities, these students will have more experiences to share.

Linguistic Approaches

Linguistic approaches emphasize phoneme/grapheme relationships and minimize any comprehension skills in the early stages of instruction (Marsh, Price, & Smith, 1983), stressing the student's ability to see patterns across groupings of words. Many linguistic programs use a whole word approach, clustering words that are similar in structure. Students learn not separate sounds but words based on similar spelling patterns. For example, a student who learns the word "cat" can use that word as a model for identifying similar words such as "bat" and "fat."

Some basal series use linguistic exercises in their overall approach. Linguistic exercises may prove to be difficult for many retarded learners because of the stress on auditory perception skills and the assumption that students will begin to perceive relationships on their own (Kirk, et al., 1978). Retarded learners who have



Teaching reading and language arts in a group activity includes oral expression.
(Courtesy of Kay Shaw)

difficulty transferring knowledge or skills across situations will probably have a great deal of difficulty with this approach.

Teachers will find linguistic approaches useful if they closely monitor student progress and provide ample direction in the form of frequent prompts and cues built in to the materials (e.g., “man,” “pan,” “tan”).

Remedial Reading Approaches

One common characteristic of mentally retarded learners is they generally have not progressed well in programs that have used one of the developmental approaches to reading instruction. Approaches that rely too heavily on auditory perception skills or do not allow adequate practice on fewer skills will provide difficult obstacles for retarded students. Remedial reading approaches attempt to teach skills in a format matching the learning characteristics of retarded students.

Basically, remedial reading approaches include some, all, or varied combinations of the following features:

1. They allow repeated practice (overlearning) of skills spread out over a longer period of time, allowing retarded learners with long-term memory deficits to retain the material better.
2. They include cues in the material that assist the learner in focusing attention on the relevant stimuli of the task.
3. They include a more thorough scope and sequence, allowing learners to master easier skills before moving to more difficult material.
4. They provide learners with immediate feedback concerning their responses and shape correct responses when errors are made.
5. They include opportunities for students to practice learned skills under varying conditions to promote generalization.
6. They incorporate the use of antecedent teacher behaviors such as modeling or prompting to increase the probability of correct student responses.
7. They incorporate a variety of techniques allowing students to practice skills using visual, auditory, and tactile modalities.

Remedial approaches are specialized and should be matched to the strengths and weaknesses of each learner. Remedial approaches in the resource room may not be appropriate if they conflict with the primary instruction in the regular education classroom. However, for learners whose reading program is the responsibility of the special educator or in cases where regular educators are convinced a change is needed, remedial programs can be an asset.

DISTAR Reading Program

The DISTAR Reading Program (Englemann & Bruner, 1974) is a highly structured program emphasizing decoding skills. This program includes activities

emphasizing left-to-right orientation and sequence, blending tasks that stress spelling by sounds (e.g., “say it slow” then “say it fast”), and rhyming tasks that demonstrate relationships between sounds and words.

The DISTAR program uses several of the instructional techniques previously mentioned. Students receive immediate corrective feedback and are given both tangible and social reinforcers for appropriate responses. Also, this program provides ample repetition, with mastery required before movement to new skills can occur.

The DISTAR approach has proved to be very effective with some children. The key elements of this program appear to be its structure, continuous feedback, and systematic reinforcers. By providing these elements in all reading activities, teachers may be able to effect greater gains in reading among their students.

Peabody Rebus Program

The Peabody Rebus Reading Program (Woodcock, Clark, & Davis, 1979) is a unique system because it uses pictures instead of words during initial instruction. These pictures, called “rebuses,” introduce readers to a basic vocabulary of 35 words that, when used in stories, allow them to learn and practice several basic reading skills.

As students increase their rebus vocabulary, the program moves them into a transition phase, pairing the rebuses with the printed words they represent. Over time, the rebuses can be faded as students learn the words without need of the picture cues.

At the completion of the Rebus program, students should have developed skills necessary to succeed in beginning basal programs. This system may provide help to students who have gained little or no reading skills at younger ages. The technique of pairing pictures with printed words can also be carried over to basal readers with some additional work by the regular and special education teachers.

HEGGE-KIRK-KIRK Remedial Reading Drills

The Remedial Reading Drills (Hegge, Kirk, & Kirk, 1965) is a program designed to remediate the severe deficits in decoding exhibited by some elementary-age retarded learners. This program helps students to establish sound-symbol associations, closure, and the left-to-right orientation in reading words.

The authors do not present this program as being self-contained or separate from other programs (Kirk, Kliebhan, & Lerner, 1978). Conversely, they see the Remedial Reading Drills as an attempt to help students learn the skills necessary to use basal readers. The program first presents activities that allow for practice in associating sounds with the consonants, vowels, and blends that commonly occur in beginning basal readers. The activities allow for immediate practice in saying sounds in the context of words. Subsequent lessons introduce more complex blends and uncommon sounds.

This method has been successful with learners who have failed to learn to read (Marsh, Price, & Smith, 1983). The strength of the program appears to be its highly structured approach and the opportunity it provides for the students to immediately generalize the decoding skills to words commonly found in their reading books.

Functional Whole Word Approach

For most moderately and all severely retarded students, learning to read through traditional approaches such as phonetic and basal readers may not be a realistic goal. This does not mean that these learners cannot acquire useful reading skills. The approach to teaching reading skills must be redefined and expanded beyond what was once thought possible for these students.

Functional reading has been defined as a student's actions or responses resulting from reading printed words (Brown & Perlmutter, 1971). The key to teaching functional reading skills is the teacher's ability to observe the student's actions as they relate to words read. For example, a severely retarded learner who reads the word "bread" on a shopping list and then selects a loaf of bread in the store has performed an observable behavior that was a result of her reading the printed stimuli. *Functional* is the key word, and it is related to the concept of community validity. Words targeted for instruction must be functional because the ability to read them allows learners to become more independent in community living activities (Snell, 1983).

The approach that has been most successful in teaching moderately and severely retarded learners functional reading skills is called the *whole word approach*. This method involves pairing pictures with corresponding words, using both auditory and visual modalities (Sidman & Cresson, 1973). The difference between this approach and the Rebus approach described earlier involves the words used during instruction. The whole word approach teaches words that have immediate application to the community. The Rebus system teaches words that are immediately applicable to beginning readers, and it also teaches additional skills related to reading stories.

Functional reading involves two distinct outcomes: (1) identifying and reading the word and (2) performing the related task. Retarded learners must be able to master both outcomes before their reading skills can be considered functional. For example, teaching a learner to read and say the phrase "Turn on the water" is nonfunctional until the student learns how to turn on the water. When teaching more severely handicapped learners, both aspects have to be taken into account.

In addition, functional reading involves identifying words that are needed by students to actively participate in community activities. Teachers can cluster words according to specific activities (e.g., words encountered in grocery store shopping) or technical vocabulary related to potential employment outcomes (e.g., words encountered when engaging in custodial skills).



KEY CONCEPTS



Two categories of approaches are available for teaching reading skills: development or remedial. Developmental approaches include basal reading programs, phonetic analysis or decoding programs, language-experience programs, and linguistic systems. Remedial approaches used after reading problems surface include the DISTAR Reading Program, the Edmark Reading Program (Bijou, 1977), the Peabody Rebus Reading Program, the Hegge-Kirk-Kirk Remedial Reading Drill, and the functional whole word approach.

- Basal reading programs can be an excellent source of structured reading activities. However, mildly retarded learners will have a difficult time keeping up with the lessons because too many objectives are covered per lesson and the number of opportunities for practice may not be sufficient.
- Approaches that emphasize cracking the code such as phonetic and linguistic systems may also discourage retarded learners if presented in traditional fashion. These approaches rely heavily on auditory processing skills, an area in which many retarded learners have deficits.
- Language experience techniques can be used effectively; however, the learners will need to be involved in many interesting activities so they will have the requisite experiences for discussion. This approach is not a total program, but it can be helpful as supplemental activities.
- Remedial reading programs have helped learners make great gains. However, they can also be confusing to learners if used in conjunction with the developmental approaches.

IMPLEMENTING INSTRUCTIONAL STRATEGIES

Deciding what to teach students based on their needs is a major portion of the programming effort. Younger mildly handicapped students have an excellent chance to become independent readers if teachers can match an appropriate program to their needs and head off their learning of inappropriate reading habits. As they grow to adolescence, their programs should become increasingly more functional, providing opportunities for them to apply their reading skills to community activities such as reading the newspaper, job applications, and recipes.

Moderately and severely retarded students need to begin reading functional words as soon as they master the ability to complete the related task. For example, once a severely retarded learner learns to wash dishes he can begin to learn words relating to dishwashing (e.g., "soap," "sponge," "towel").



IDEA FILE



Mildly retarded students pose the most unique problems for teachers, depending on whether they are mainstreamed into regular classes for reading or receive reading instruction in a self-contained special education classroom.

- When mildly retarded learners receive primary instruction in the special education class, the teacher may wish to use a remedial program as the main thrust. These programs provide more practice over smaller chunks of instruction and give the students more feedback. In addition, they often include visual cues that assist learners who have auditory deficits.
- At least two options exist for students mainstreamed for their reading program. In conjunction with the IEP committee, the regular and special educators may decide not to use the more traditional approaches until the learner has gained a certain number of skills. For example, the Rebus program could be used for a designated period of time, after which the student would have gained sufficient skills to enter a basal program.
- Another option is to assist the regular teacher in adapting the basal system to meet the learner's needs. The regular teacher would need to be convinced that only one or two objectives should be targeted for a learner at one time. When the student masters those, he or she can move on to the next set of objectives. For example, if a lesson covers six objectives the student would be required to do the activities related to one or two targets.
- Choosing only parts of lessons for one or two students means these learners will be required to do more independent work while the regular education teacher finishes with the rest of the group. Because retarded learners are not always the best independent workers, peer tutors can be used liberally to assist the handicapped students in completing their tasks (Cooke, Heron, & Heward, 1983).
- Independent workers may be engaged in activities requiring them to read stories that may be slightly above their easy reading level. When this occurs, regular education teachers can have the stories tape-recorded by other students. (The special educator may wish to have this done as a service to mainstreamed students and a help to the regular education teachers.) The independent workers can then listen to the story while they are reading it.
- Special educators can help regular education teachers and mainstreamed students by modifying materials to meet the students' needs. For example, the reading level of material can be reduced by rewriting. This technique allows students to study the content on their own reading levels. Additional materials are being commercially produced that accomplish this task for teachers.

Techniques for Teaching Decoding

It can be easier to teach decoding skills to students with reading deficits if teachers locate exactly where the skills have broken down in relation to a task analysis. A

student who cannot decode words with consonant blends will have difficulty moving on to more difficult skills. Once teachers identify the areas where the breakdowns occur, they can design instruction to begin teaching at that point.

1. To combat attention and auditory processing problems, some retarded learners may need to spend some time practicing saying and identifying sounds/blends while they listen to a tape-recorded activity via earphones. Visual stimuli should be presented in conjunction with the auditory exercises (Blackman, Burger, Tan, & Weiner, 1982).
2. Using pictures of visual cues can assist learners in remembering a specific consonant or vowel sound as well as various blends. For example, pairing initial consonants with pictures whose names begin with the same consonant helps to cue students to remember and pronounce the sounds (e.g., S = picture of a slide).
3. Retarded learners may have trouble generalizing the application of rules to many different situations; however, they may be able to use a model as a guide for decoding words that have similar sounds and blends. For example, one rule for words that end in a consonant plus "be" is that the consonant usually begins the last syllable. The word "table", an example of this rule, could be taught to the student using picture cues and then could be used by the student as a model for decoding similar words such as "able" and "cable".
4. Initial sounds can be taught by placing the letter on one side of the page and several words that begin with the sound on the opposite side of the page (e.g., b = _ all, _ at, _ end, _ ent).
5. Auditory discrimination training may be an important part of learning the decoding process for some students. Activities that allow students to practice discriminating among sounds are important. Some retarded learners may benefit from practicing auditory discrimination exercises using *good quality* headphones, tape recorders, and tapes. Some learners with auditory processing deficits can better discriminate among relevant stimuli when all other stimuli are reduced and the key words are isolated. The headphone exercises can gradually be faded out of the instructional system to be replaced by similar exercises conducted in a group activity.
6. Context clues and the ability to use them are an important extension of word attack skills (Allington, 1980). The use of sentences from which part of the sentence or a single word is omitted helps students learn to look for context clues. For example, the sentence "I am going (home, house, help) after school" can be presented requiring the student to fill in the blank. The difficulty retarded learners have in attending to relevant stimuli hampers their ability to decode the meaning. Color coding the context clues or the actual answers in a number of model sentences may provide valuable assistance to these learners, helping them to retain the skill as the color codes are gradually faded (Singh & Singh, 1984).
7. Helping students see the structural analysis of words (e.g., compound words, prefixes, suffixes) can be accomplished by color coding or including pictures or symbols depicting the meaning of, for example, common prefixes.
8. Some retarded learners may perseverate or hesitate on one letter or blend. Helping students see whole syllables can assist them in decoding words. Any technique that allows the student to pay attention to a syllable as a unit may be helpful (e.g.,

making one syllable larger and one smaller or using different colors for different syllables).



IDEA FILE



The application of microcomputers in classrooms for retarded learners is becoming more widespread (Hagen, 1984). Microcomputers in the classroom can help teachers manage daily tasks such as record keeping and IEP development, or they can be an instructional tool, helping students to practice learned skills. Computer assisted instruction (CAI) has several advantages that can be applied to the instructional needs of many retarded learners.

Rupley and Blair (1983) have identified six advantages of microcomputers that can make them helpful to retarded students:

- Enhancing student interaction and motivation.

- Providing immediate feedback.

- Providing record-keeping capabilities.

- Providing needed reinforcement.

- Allowing self-paced instruction.

- Freeing the teacher to work with other students while some students work on the computer. (p. 426)

Teachers can get the most from microcomputers if they understand some of the basics of programming. These skills, however, are not a prerequisite for using CAI. Basically, teachers need to know the simple mechanics of the hardware (e.g., computers, monitors, disk drives) and care of the equipment. Hardware evaluation or choosing the best computer for their needs is often the responsibility of school district personnel. The more important task is choosing the right software for use in the classroom.

Kamil (1984) has identified some key concerns in evaluating educational software, beginning with the question, "Does the program do something better than what could be done without a computer?" (p. 265). Availability is the first concern noted by Kamil, because many programs are advertised before they can be delivered or before all the problems are eliminated.

A second key concern involves judging the content and deciding whether or not it is appropriate to the existing curriculum. Judging whether or not the skills presented are at an acceptable developmental level for a given set of students is a major consideration.

Retarded learners require frequent and meaningful feedback; therefore, teachers should review whether or not the program provides frequency and specificity of feedback. Also, the program's use of attention-getting devices such as pictures, animation, music, and color capabilities can make a difference in its effectiveness.

Another important aspect of software is the speed at which the material is presented. Retarded learners will vary in how fast they can process information,

and a program providing varied presentation speeds can be the most efficient choice. Finally, Kamil has cited cost effectiveness as an important consideration. Does the program require special equipment that makes the cost prohibitive? Another example of cost effectiveness relates to the amount of content available. One program can cover considerably more information than another and yet both will cost the same amount.

Microcomputers can be a great asset in teaching reading (Beltz, Detwiler, & Grant, 1983). For example, CAI can be used to provide students with varied practice activities reinforcing the basic skills in decoding and comprehension. The many practice exercises that have always been necessary and boring can now be presented in a highly motivating fashion.

There is software available that allows students to practice phonics, context clues, and syllabication activities (Goldenberg, Russel, & Carter, 1984). Also, there are a number of programs currently on the market that allow learners practice in content area reading exercises (Criscoe & Gee, 1984).

The following list is a representative sample of computer software programs available to assist in teaching reading.

*Periodicals**

The Book of Apple Software. Los Angeles: The Book Company.

Educational Technology. Englewood Cliffs, NJ: Educational Technology Publications.

International Software Directory. Fort Collins, CO: Imprint Software.

TRS-80 Educational Software Sourcebook. Fort Worth, TX: Radio Shack Educational Division.

*Software**

Descriptive Reading. Freeport, NY: Educational Activities Incorporated.

First Words. Burlington, VT: Laureate Learning Systems, Inc.

Language Arts Skills Builders. Allen, TX: Developmental Learning Materials.

PAL Reading Curriculum Packages. Aurora, CO: Universal Systems for Education, Inc.

Reading Comprehension Games. Roslyn Heights, NY: Learning Well.

Reading Skills Series. Glenview, IL: Scott, Foresman Electronic Publishing.

*These lists were adapted from Criscoe & Gee (1984) and Hagen (1984). Both sources contain an excellent description of the materials as well as complete addresses, prices, and in the case of software, the computers that will accept the programs.

Techniques for Teaching Reading Comprehension

Helping students to get "hooked" on reading can be an important first step in teaching reading comprehension skills. Retarded learners with a history of reading failure may find it stressful to be placed in a situation where reading is required. Two important tasks that teachers should accomplish are pinpointing the student's independent or instructional reading level and finding age-appropriate or high-interest material on the target level.

Reading to students is an important motivation technique. Some students come from homes where reading is not stressed. Students who witness others reading for pleasure may be more apt to try it themselves. Setting aside small portions of the school day for reading the students a continuing story is one technique to foster more interest in reading.

Finally, many retarded learners who have severe reading deficits can be helped by talking books, which can be useful in teaching them some comprehension skills and generally increasing their interest in reading. An extensive talking book library should be a part of many classes, and it can be obtained by asking volunteers to tape books and stories. Choosing people who do not have pronounced accents and using good quality tapes and recorders lends to the effectiveness of this method.

The following are suggestions for methods and activities that may be helpful in teaching reading comprehension:

1. Understanding basic vocabulary is an important initial step in improving comprehension skills. Helping students develop branching trees by clustering words according to association is one technique to improve word comprehension (Baumann & Johnson, 1984). For example, the word "ball" can be associated with "catch" and "throw." As students begin to learn words in clusters, these words become cues for other associated words.
2. It is important to teach learners vocabulary words that lend meaning to a paragraph by describing when things occur. Mercer and Mercer (1985) have suggested that initially teachers should present words such as "to begin with, next, after that, and finally" (p. 301), helping the students to follow the organization of the story.
3. The ability of students to identify key words and main ideas in a sentence or paragraph is an important skill. Color coding words or underlining main ideas can help direct the students' attention to relevant stimuli. Whenever artificial cues are used, they should be faded from the instruction as soon as they are no longer necessary (Bruno & Newman, 1985).
4. After students read stories, teachers can provide them with phrases that describe what the story was about (Englert & Lichter, 1982). After a number of trials, teachers can provide multiple phrases, requiring the students to choose the one that best fits the story.
5. Teaching retarded learners the thinking process that accompanies reading comprehension may help them to grasp some more difficult skills. Stauffer (1969) has expressed the belief that questions asked by the teacher (e.g., "Can you prove it?") help stimulate the student's interest in reading comprehension because they

- require the student to support answers with information from the text (Wood & Mateja, 1983). Students can also generate their own questions prior to reading the passage (Cohen, 1983).
6. Having students role play the characters in stories may help them pay more attention to the details of the text (Jenkins, Stein, & Osborn, 1981). For example, a student might silently read a sentence such as, "Jimmy was sad," and then act out how Jimmy felt. This technique can be used with more difficult material and longer stories.
 7. An instant camera can be an aid in teaching comprehension skills. Pictures can be taken of students participating in various activities. The pictures can accompany the sequence of the events, and students can practice placing the pictures in the appropriate sequence based on the story. An adaptation of this technique is to number the pictures and then place the same number next to the corresponding sentence.
 8. Prompting students during comprehension practice (e.g., setting the stage for the story, providing questions prior to reading, verifying story ideas) is a technique that may help students improve their skills (Rupley & Blair, 1983).
 9. Kann (1983) developed a method called *repeated readings* that requires a student and teacher to read a passage aloud together several times. This method is a version of the neurological impress method that is designed to improve the fluency of learners who tend to "get stuck" on sounding out words phonetically. Neither the repeated readings method nor the neurological impress method claims to improve comprehension per se; however, the students do seem to improve their oral expression and confidence. These techniques should be used in conjunction with other reading comprehension activities (Bos, 1982).
 10. Teachers can develop story frames to assist students in organizing the information presented in a reading passage or story. Fowler (1982) presented five tasks for developing story frames that can focus on plots, locations, characters, and times: (1) identifying the problem of the story; (2) writing a paragraph about the problem; (3) deleting unnecessary words that mask the problem; (4) designing cues to help students focus on the problem; and (5) modifying the frame for other passages. The frames are essentially outlines that include written cues that direct student attention to the important areas of the passage (e.g., "The name of the troublemaker is. . .") (Moldofsky, 1983). Teachers can read a passage and show the students how to use a frame, eventually allowing them to use the frames independently.
 11. Teachers should cue learners about the content of a passage or story prior to instruction or reading (Wilson, 1983). Mildly retarded learners tend to have poor experiential backgrounds, and this can adversely affect their ability to comprehend subject matter. Teachers can help by providing students with information about the story before reading begins.

Techniques for Teaching Content Area Reading Skills

The move to mainstream mildly retarded learners into classes with their regular education peers has created new problems for teachers. As these students move up through the grades, their participation in content subjects (e.g., science, social

studies) requires them to absorb material via traditional methods such as reading textbooks and taking notes from teacher lectures.

Unfortunately, the reading levels of most mildly retarded learners are far below the reading levels of many content area textbooks. Teachers must use innovative methods to teach these students the desired content skills by circumventing their reading deficits. New materials are being developed that cover the content subjects on lower reading levels (e.g., Project Life School, Fearon Publishers). These materials can be a great help and can be used to supplement other basic techniques.

1. Teaching students key vocabulary in content area lessons can assist them in comprehending class lectures and scanning more difficult reading materials. These words can be taught using sight word techniques such as pairing the word with a corresponding picture.
2. Having peers tape-record chapters can provide learners with another modality for covering the assignments. Peer tutors can also assist mildly retarded learners in studying for tests or completing assignments.
3. Teaching good study and note taking skills can be a great help to mainstreamed learners. Criscoe and Gee (1984) have suggested teaching the "survey, question, read, recite, review" approach. Basically, students are taught to survey the material briefly, locating the main points. They then convert the main points to questions that may help to increase their comprehension. At that point, they read until they can answer each question, recite the answers, and finally review after all questions have been answered.
4. Regular education peers can take notes for mainstreamed students who are unable to listen and write at a fast pace. Another approach is to provide the learner with a tape recorder to record lectures. The study techniques listed in (3) can also be used when studying from taped materials.
5. Memory aids are an important set of skills for retarded learners. Criscoe and Gee (1984) have suggested five categories of memory aids: (1) poetic devices—"thirty days hath September"; (2) associations—"ie in piece is a piece of pie"; (3) grammatical devices—acronyms, coined words; (4) linking techniques—linking words to form a mental image; and (5) location techniques—visually "walking through" the exercise (pp. 251—255).
6. Many mildly retarded learners may not perform well on content area tests because of their deficits in reading (Bruno & Newman, 1985). Special educators could assist regular education teachers in developing alternate projects that assess students' knowledge, yet do not rely solely on reading ability. For example, students may be required to obtain the phone numbers of community agencies and legal aid services, calling each to gather information about how they can help with legal problems. This project might be assigned in lieu of a test covering information about a state's legal system.
7. Providing learners with an outline of the subject matter they are about to read helps them anticipate what to look for in their reading (Bean & Peterson, 1981). Special educators can develop these outlines by asking the content area teachers what topics in the readings are considered most important. Partially completed outlines can be provided for students to complete (Roe, Stoodt, & Burns, 1983). This technique also helps students discriminate the important points in the reading.



There are many resources available providing suggestions for teaching techniques and activities. The following is a partial list:

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- Radabaugh, M., & Yukish, J. (1982). *Curriculum and methods for the mildly handicapped*. Boston: Allyn & Bacon.
- Schulz, J., & Turnbull, A. (1983). *Mainstreaming handicapped students*. (2nd ed.). Boston: Allyn & Bacon.
- Wiederholt, J., Hammill, D., & Brown, V. (1983). *The resource teacher: A guide to effective practices* (2nd ed.). Boston: Allyn & Bacon.
- Young, M. N., & Gibson, W. B. (1962). *How to develop an exceptional memory*. Hollywood: Wilshire.

Techniques for Teaching Functional Reading Skills

The techniques for teaching functional reading skills are the same as those used for teaching other reading skills. The uniqueness of this approach involves the functionality of the targeted words (Polloway & Polloway, 1981). Recipes, newspapers, job applications, safety words, menus, and street signs are representative of vocabulary that can be considered functional. The approaches used to teach functional skills can be the same as those used to teach decoding and comprehension.

1. Classic studies by Dorry & Zeaman (1973, 1975) provided evidence that pairing vocabulary words with pictures, *slowly* fading the pictures when they were no longer needed, was a powerful technique for teaching reading using the whole word approach (Worrall & Singh, 1983).
2. This instructional approach can be strengthened when words are presented in clusters organized by their common characteristics (Domnie & Brown, 1977). For example, teachers may teach as a cluster words that are commonly found in fast food restaurants.

3. Pictures paired with written directions such as recipes can be a successful method for teaching retarded learners functional reading (Hargis, 1982; Robinson-Wilson, 1976; Staples, 1975).
4. Matching to sample is a technique that helps students to discriminate among words by matching a word to a stimulus provided by the teacher (Taylor, Thurlow, & Turnure, 1977). For example, a student matches a card with the printed word "danger" to a similar card presented by the teacher.
5. Having students imagine or visualize a situation or picture in conjunction with a word may help them to remember the word (Gickling, Hargis, & Alexander, 1981).

Techniques for Teaching Written Expression Skills

Skills in written expression can be viable curricular goals for mildly retarded learners. Activities that foster letter writing skills, note taking, and in some instances creative writing can help these learners become more independent.

1. The microcomputer can be a tremendous help to mildly and moderately retarded learners practicing written expression. Word processing packages (e.g., BANK STREET WRITER[®] from Broderblind Software, Inc.) can assist learners who previously have found writing too difficult because of severe deficits in handwriting, spelling, punctuation, and other skills. Using microcomputers, which are fun and easy to use, these learners can now complete work they once considered tedious.
2. Providing students with a list of words they can use to form sentences can be a meaningful exercise for those who lack an adequate vocabulary.
3. Providing students with uncompleted sentences that they are required to finish by supplying the main idea can help them to complete their thoughts. The procedure would be to gradually fade the numbers of words provided by the teacher (Mercer & Mercer, 1985).
4. For students whose experiences are limited, organizing groups to share ideas for a story can be a helpful way to generate content. Teams of students can work together to polish the story on the microcomputer.
5. Graham and Miller (1980) have supported teaching manuscript writing to exceptional learners. Manuscript appears easier to master than cursive; however, it is less versatile. The best practice may be to match the technique best suited to each student.
6. Hagin (1983) has suggested an approach that combines both manuscript and cursive writing. Manuscript letters are connected using waves, pearls, wheels, and arrows. Students practice at the chalkboard and on acetate sheets placed over printed models.
7. Commercially produced methods for teaching cursive writing may provide teachers with an effective, structured program (e.g. Barbe, Lucas, Hackney, Braun, & Wasylyk, 1984).
8. Reading and spelling are so closely related they should be emphasized together as much as possible. For example, students can identify words in their readings that

- have been difficult for them to spell, and underline these words whenever they occur.
9. Learning phonetic rules that relate to spelling certain words can benefit students by helping them to generalize to new situations. Dropping the "y" to add "ing" to certain words or the "i before e except after c" rules are the most common examples.
 10. Helping students to visualize the spelling of words and using multisensory approaches have been successful methods for improving the spelling of some handicapped learners. Fitzgerald (1951) developed a method that allowed students to look at the word, say the word, visualize the word, and then write the word without use of a stimulus. Fernald's (1943) method allowed students to trace with their fingers words written with crayon or cut out of sandpaper.
 11. Presenting functional words that students frequently come in contact with allows additional opportunities for correct spelling.
 12. Mildly retarded learners will always have trouble spelling; therefore, they should be taught how to locate and use the many excellent spelling reference books available that are often easier to use than a dictionary. Also, if students have access to microcomputers, they can be taught to use word processing software that either locates or locates and corrects misspelled words in written expression.



KEY CONCEPTS



- When teaching decoding skills to retarded learners it is important to pay close attention to auditory processing deficits. Having students use headphones to listen to sounds while pronouncing them may be helpful because outside distractions are minimized and they can hear their responses directly.
- Pairing picture cues with sounds, color coding, drawing arrows, and underlining are all useful techniques for helping learners attend to the important properties of the stimuli.
- Reading aloud to learners frequently, especially when a story is spread over a number of days, can help build a more positive attitude toward reading.
- Using the talking book approach may help students improve their comprehension skills and assist them in learning new concepts presented in books they may not be able to read independently.
- Peer tutors can be helpful in all areas of teaching reading to retarded learners. They can be especially helpful to retarded learners who are unable to read content area texts while they are enrolled in mainstreamed classes.
- Pairing pictures with words and clustering words based on common characteristics can aid in teaching functional reading skills.
- Word processing software for microcomputers can be a helpful aid for teaching written expression skills.

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TEACHING FUNCTIONAL ARITHMETIC SKILLS

■ Teaching retarded students arithmetic skills has long been a priority of special educators. Traditionally, mildly retarded learners were expected to learn rote arithmetic skills at about the third grade level. Moderately retarded learners were thought to be able to count basic groups of objects and add and subtract simple numbers. Severely retarded learners were not expected to learn arithmetic skills.

Fortunately, research efforts have provided evidence that these students can learn more advanced arithmetic skills. For example, Lancioni (1982) used non-handicapped peer tutors to teach abstract problem solving to retarded elementary school students. Smeenge, Page, Iwata, and Ivancic (1980), in an applied behavior analysis study, demonstrated the effectiveness of using a task analysis for teaching measurement skills to moderately retarded students.

NEED FOR FUNCTIONALITY

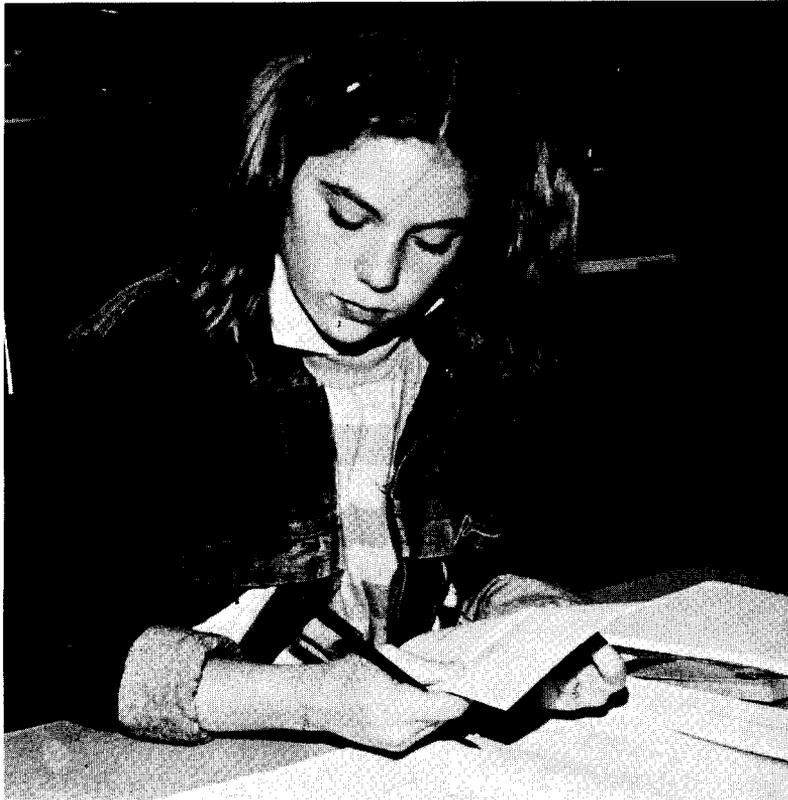
The studies just cited are representative of the many that can be found in the literature. Proof exists that these students can learn complex arithmetic skills in controlled situations. Why, then, do teachers find this curricular area so difficult to teach? A partial answer to this question may be found in the outcomes teachers choose for their learners (Bartel, 1982). Arithmetic programs that require students to demonstrate their competence in arithmetic by practicing only paper and pencil activities may not be providing them any reason to learn.

The thrust of teaching arithmetic to retarded learners has been to move away from teaching these skills out of context and toward teaching them as functional skills (Schwartz & Budd, 1983). Schwartz and Budd defined functional math

(arithmetic) as “. . . uses of mathematics needed for vocational, consumer, social, recreational and homemaking activities” (1983, p. 322).

Vitello (1976), after numerous studies of how retarded students learn arithmetic skills, posited that these learners have considerable problems comprehending arithmetic concepts that involve symbols and abstract notions, the types of problems presented on many paper and pencil activities. Studies that have attempted to teach functional arithmetic skills generally have met with success, possibly because the symbols automatically are presented in a more concrete, highly motivating form (Eich, 1981; Frank & McFarland, 1980; Sarber & Halasz, 1983; Trace, Cuvo, & Criswell, 1977).

The underlying theme throughout this text has been to emphasize the importance of functionality in skills taught to retarded learners. Functionality involves identifying those skills that have a high probability of use in community settings. Often the skills identified as community-valid resemble skills listed in a tradi-



Balancing a checkbook is a community-valid skill. (Courtesy of Kay Shaw)

tional arithmetic scope and sequence chart. For example, a teacher may want to teach her secondary mildly retarded students how to use fractions and percentages. At this stage she has two choices: (1) to teach these skills using worksheets, blackboard exercises, or other classroom activities or (2) to teach these skills in relation to how they are used in everyday life (e.g., household budgets, recipes). These two choices may not be mutually exclusive; however, in some instances, teachers do teach arithmetic skills out of context instead of blending classroom activities and community exercises into a worthwhile unit (Oberlin, 1982).

This chapter presents some of the key methods for effectively teaching arithmetic skills to retarded learners. Most retarded students can learn at least *some* arithmetic skills provided the skills are meaningful for their independence. Although most of the information presented here is geared for mildly and moderately retarded learners, examples will be presented demonstrating how some community-valid arithmetic skills can be taught to the severely retarded.

Readers should refer to two important charts presented in Chapter Three before proceeding in this chapter. The first is Figure 3.2, which presents the curriculum development process this chapter will follow. The second chart is Figure 3.5, which presents a scope and sequence chart for arithmetic skills. All community based activities in arithmetic can be based on the skills presented in this chart.

ARITHMETIC: THE IEP

One practice used when developing IEPs is to list a series of arithmetic skills from a scope and sequence chart that are about at the student's grade level. Although this practice may be technically acceptable, it may not be in the best interest of the learner, because the skills listed may not be functional in terms of the learner's present and future needs. An alternative is to write the short-term objectives for the IEP including outcomes that are community-valid.

For example, one type of outcome for a coin equivalency objective might be that the student will discriminate among quarters, dimes, and nickels. An alternative might be that the student will identify the coins necessary to purchase a soda from a vending machine. Further examples of this approach will be presented later in this chapter. The key issue involves the ability of teachers to actively seek out the types of activities needed for skills to become functional. This task requires teachers to conduct a thorough community needs assessment.

Steps One and Two: The Community Needs Assessment (CNA)

Conducting and analyzing the results of a CNA (see Figure 3.2) helps keep teachers constantly aware of the functional uses that academic skills have in society. More important, the CNA allows teachers to identify situations and places in the community where they can bring their students to practice the skills they learn.

Retarded students generally will learn best if the skills presented are ones they are most likely to encounter frequently. For example, sorting coins in an attempt to learn names or equivalencies may not be as realistic as choosing coins to operate a vending machine. By conducting a CNA, teachers can identify the daily uses that students have for arithmetic skills.

Arithmetic skills have a variety of applications in a person's life roles. These skills are important to a person as a consumer, home manager, worker, and family member. Teachers may wish to develop their CNAs around these roles, attempting to identify the types of skills students need to be more independent in these areas, where these skills can be practiced, the types of realistic materials needed, and community members who can help by either being part of the program or providing resources. Table 9.1 provides an example of some areas that a CNA in arithmetic might cover.

Step Three: Identifying Potential Annual Goals

Potential annual goals for arithmetic can be identified on two levels: those typically found in scope and sequence charts and those identified as applications of arithmetic skills to community activities. Figure 3.5 (Chapter Three) provides one example of a scope and sequence chart of arithmetic goals. The following list of examples is not inclusive, but it should provide teachers with a model for developing their own arithmetic curriculum. Bender and Valletutti (1982); Mercer and Mercer (1985); Radabaugh and Yukish (1982); Silbert, Carnine, and Stine (1981); and Stephens, Hartman, and Lucas (1983) have provided additional examples of scope and sequence charts for arithmetic.

TABLE 9.1 *Partial List of Potential Community Environments Where Students Can Use Arithmetic Skills*

<i>Community Environment</i>	<i>Related Arithmetic Skills</i>
Fast Food Restaurants	<input type="checkbox"/> Calculating Change and Cost of Items
Grocery Stores	<input type="checkbox"/> Cost Comparison Shopping
	<input type="checkbox"/> Calculating Change and Cost of Items
Banks	<input type="checkbox"/> Managing a Checkbook
	<input type="checkbox"/> Obtaining Change
	<input type="checkbox"/> Cashing Paychecks
Various Worksites	<input type="checkbox"/> Telling Time
	<input type="checkbox"/> Liquid and Solid Measurement
Home	<input type="checkbox"/> Cooking Involving Measurement
	<input type="checkbox"/> Developing a Family Budget
	<input type="checkbox"/> Other Activities Involving Measurement (e.g., woodworking)

ARITHMETIC: LEVEL 1

Numbers, Counting, and Place Values

Mildly Retarded

1. Matches the correct numerals with pictured sets of objects.
2. Says the correct numbers when presented with sets of objects up to 10.
3. Writes numbers from 1 to 100 when directed.
4. Writes numbers that are either prior to or follow a given number up to 100.
5. Writes the words "odd" or "even" when presented with numbers up to 10.
6. Orders objects based on their positions, first through tenth.
7. Identifies place values up to the hundredth place.
8. Writes numbers up to the hundredth place when presented with oral stimuli.

Moderately Retarded

1. Matches the correct numerals with pictured sets of objects.
2. Says the correct numbers when presented with sets of objects up to 10.
3. Writes numbers from 1 to 100 when directed.
4. Writes numbers that are either prior to or follow a given number up to 100.
5. Writes the words "odd" or "even" when presented with numbers up to 10.
6. Orders objects based on their positions, first through tenth.
7. Identifies place values up to the hundredth place.
8. Writes numbers up to the hundredth place when presented with oral stimuli.

Severely Retarded

1. Matches correct numerals with pictured sets of objects up to 10.

Operations

Mildly Retarded

1. Memorizes basic addition and subtraction facts from 0 to 10.
2. Computes one-digit plus one-digit numbers and two-digit plus two-digit numbers without regrouping.
3. Computes one-digit plus one-digit numbers and two-digit plus two-digit numbers with regrouping.

4. Computes one-digit minus one-digit numbers and two-digit minus two-digit numbers without regrouping.
5. Computes one-digit minus one-digit numbers and two-digit minus two-digit numbers with regrouping.
6. Memorizes basic multiplication facts.
7. Computes two-digit times two-digit numbers both with and without regrouping.
8. Memorizes basic division facts.
9. Computes three-digit divided by two-digit numbers with and without borrowing.

Moderately Retarded

1. Computes basic addition and subtraction problems with and without regrouping.

Severely Retarded

1. Adds and subtracts sets of objects up to 10.

ARITHMETIC: LEVEL 2

Operations

Mildly, Moderately, and Severely Retarded

1. Demonstrates the proper care and maintenance of a variety of pocket calculators.
2. Uses a variety of pocket calculators to compute daily living problems requiring addition, subtraction, multiplication, and division (e.g., discriminating between similar items in a grocery store based on a price per unit).

Measurement

Mildly Retarded

1. Compares objects on the basis of length (e.g., longer vs. shorter).
2. Measures in linear units a variety of objects relating to home living and vocational settings.
3. Compares linear metric units to customary units.
4. Compares weight of objects using a balance.
5. Weighs a variety of objects found in home living and vocational settings.
6. Compares metric units of weight to customary units.

7. Measures liquid and dry volumes in a variety of home living and vocational settings.
8. Compares liquid and dry metric units to customary units.
9. Measures temperature in a variety of home living and vocational settings.
10. Compares temperature using metric units and customary units.

Moderately and Severely Retarded

1. Measures in linear units and units of weight, volume, and temperature in a variety of home living and vocational settings using adaptations such as color coding or picture representations.

Money

Mildly Retarded

1. Identifies coins.
2. Demonstrates the value of coins.
3. Computes money problems. Uses addition and subtraction to compute money problems involving making change for various coin denominations.
4. Identifies currency.
5. Demonstrates the value of currency.
6. Makes change for currency.
7. Uses addition and subtraction to compute money problems involving making change for various currency denominations.
8. Successfully uses money in a variety of transactions.
9. Computes sales tax for a variety of objects.

Moderately and Severely Retarded

1. Uses coins and currency (up to \$10.00) in a variety of transactions.
2. Uses coins to successfully obtain goods from a variety of vending machines, mass transit ticket machines, and other devices.
3. Successfully uses adaptive shopping methods (e.g., the dollar plus technique—Nietupski, Certo, Pumpian & Belmore, 1976).

Time

Mildly Retarded

1. Names days of the week and months and knows the year.
2. Indicates times of the day by naming activities occurring (e.g., supper time).

3. Correctly uses the calendar to locate dates and manage activities.
4. Tells time using a conventional or digital clock by the hour, half-hour, quarter-hour, and minute.
5. Understands time in relation to vacations, holidays, and weekends.
6. Estimates time involved to complete various tasks around the home and in vocational settings.
7. Practices the principles of good time management.
8. Understands time zones in the United States.

Moderately Retarded

1. Names days of the week and months and knows the year.
2. Indicates times of the day by naming activities occurring (e.g., supper time).
3. Correctly uses the calendar to locate dates and manage activities.
4. Tells time using a conventional or digital clock by the hour, half-hour, quarter-hour, and minute.
5. Understands time in relation to vacations, holidays, and weekends.
6. Estimates time involved to complete various tasks around the home and in vocational settings.
7. Practices the principles of good time management.

Severely Retarded

1. Understands the relationships of time and length of activities.
2. Relates time of day to specific activities.

This list includes goal statements that teachers can use as a basis, adding to the list as necessary. The list is not rigid. For example, moderately retarded learners are not restricted only to those skills incorporated under that section. The goals chosen should ultimately be based on the needs of the individual, meaning that any student may benefit from any of the skills included on the list.

Step Four: Translating Goals into Potential Short-Term Objectives

As teachers strive to develop IEPs including skills that are more valid to the community, the outcomes of the short-term objectives should reflect this shift in philosophy. For example, a classroom based objective might include the following outcome:

Outcome: The student will correctly complete word problems involving the ability to make change up to \$5.00.

Context: Paper and pencil activities in blocks of 20 minutes.

Criterion: 95% of the presented problems correct.

Keeping the outcome similar, the example can be modified to represent a short-term objective that may be more functional to the learner.

Outcome: The student will correctly compute the change that should be received up to \$5.00 while purchasing items in five different community businesses (use of a calculator.)

- Context:*
- (1) A meal in a fast-food restaurant.
 - (2) Bread, milk, eggs at one large grocery store.
 - (3) Soda, candy at one small grocery store.
 - (4) A newspaper and magazine at corner stand.
 - (5) Light bulbs and assorted items at a grocery store.

Criterion: In each instance the student will have computed the correct change to be received prior to entering the checkout line.

A short-term objective such as this one may take months or the entire school year to achieve. Teachers can design a number of classroom activities that will help the



Math games are important for encouraging practice.
(Courtesy of Kay Shaw)

student reach this final objective and also develop activities that allow the student to practice the skills in the community. The advantage to writing short-term objectives for arithmetic in this fashion is that it allows the teacher and students to keep on track, concentrating on the ultimate functionality of the skills.



KEY CONCEPTS



- The results of research studies indicate that retarded learners can learn more complex arithmetic skills than previously thought possible.
- Teachers may find it difficult to instruct retarded learners in arithmetic if they present the material out of the context of real-life activities.
- The movement by special educators is toward teaching arithmetic skills in the context of functional activities, allowing students to practice skills in community environments.
- An important task for teachers is to locate a scope and sequence chart of arithmetic skills and relate them to how they will be used in community activities.
- A community needs assessment (CNA) allows teachers to identify places in the community where their students can practice functional arithmetic skills and people from the community who can provide help and resources to their program.
- Annual goals can reflect skills taught and practiced in traditional classroom fashion (e.g., paper and pencil or blackboard activities) or skills taught in a more functional manner.
- Because retarded learners have trouble generalizing learned skills, teachers cannot be certain that arithmetic skills learned in the classroom will be used in community activities. One solution to this problem is to write short-term objectives in a form that allows learners to demonstrate that they can use their skills in functional ways.

Step Five: Assessing Student Entry Behaviors

Survey-Level Assessment: Achievement Tests

Identifying the arithmetic strengths and weaknesses of retarded learners is an important step in matching the best instructional techniques to their needs. Standardized assessment measures of arithmetic skills can be a useful beginning point for obtaining survey-type information (Algozzine & McGraw, 1980).

Commercial achievement tests are used frequently by school systems and provide data in the most general sense concerning student progress over a longer period of time (e.g., one school year). Some information such as grade levels and general deficit areas can be obtained from these tests; however, they are not sensitive enough to pinpoint specific learning problems (see Table 9.2).

TABLE 9.2 *Common Commercial Achievement and Diagnostic Tests of Arithmetic Skills*

<i>Test</i>	<i>Areas Assessed</i>	<i>Grade Levels</i>
California Achievement Tests California Test Bureau McGraw-Hill Monterey, CA	Computation Concepts Applications	1-9
Metropolitan Achievement Tests Harcourt Brace Jovanovich New York, NY	Numeration Geometry Measurement Problem solving and operations	3-9
Peabody Individual Achievement Tests American Guidance Service Circle Pines, MN	Matching and recognizing numbers Geometry	K-12
SRA Achievement Tests Science Research Associates Chicago, IL	Concepts Reasoning Computation	K-12
Fountain Valley Teachers Support System in Mathematics Zweig Associates Huntington Beach, CA	Numbers and operations Geometry and measurement Application Sets Problem solving	K-8
Key Math Diagnostic Test American Guidance Service Circle Pines, MN	Content Operations Applications	K-6
Sequential Assessment of Mathematics Inventory (SAMI) Charles E. Merrill Publishers Columbus, OH	Mathematics language Ordinality Measurement and geometry Computation Work problems	K-8
Stanford Diagnostic Mathematics Test Harcourt Brace Jovanovich New York, NY	Numeration Computation Applications	K-12

Survey-Level Assessment: Diagnostic Tests

Diagnostic tests of arithmetic are more thorough because they deal with only one subject, whereas achievement tests attempt to measure a number of academic areas (e.g., arithmetic, reading, spelling, general information). These tests tend to provide more information from each of the subskill areas of arithmetic such as word problems, operations, fractions, time, and money.

Standardized diagnostic arithmetic tests (Table 9.2) are useful as a quick method of pinpointing the areas where a student's primary deficits exist. These tests do have weaknesses, however, which require teachers to gather more information at the specific level of assessment. For example, Goodstein, Kahn, and

Cawley (1976) found that on the Key Math Diagnostic Arithmetic Test the skills included were logically sequenced but there were large gaps between the objectives represented by test items. The problem is that teachers might list on an IEP the objectives that a student misses on a diagnostic test, thus ignoring the large gaps in the learner's skills.

Another problem with many standardized tests is that they test items represented by abstract or semiconcrete concepts. The test scores of many retarded learners who function at a concrete level may not reflect the skills they have actually obtained. For example, a student may not be able to compute the answer to the problem $8 + 6$ when presented in a test item, whereas that same student may be able to tell you she assembled 14 products, 8 of one type and 6 of another.

The weaknesses of standardized diagnostic arithmetic tests do not render them useless to teachers. When used properly, these tests can provide teachers with a fast estimate of where more intensive assessment is needed. For example, a teacher may discover that Betty has scored significantly below average on a measurement subtest and yet scored about average in all other areas. This information should alert the teacher to the need for additional assessment of Betty's measurement skills. Additional specific-level assessment would come in the form of either commercially produced or teacher-made criterion-referenced tests.

Specific-Level Assessment: Criterion-Referenced Tests

Criterion-referenced tests rely heavily on a teacher's or someone else's ability to task analyze the skills of interest. A task analysis of linear measurement might resemble the following set of steps:

1. Indicates whether objects of different lengths are longer or shorter.
2. Indicates three objects of different lengths as being either long, longer, longest, or short, shorter, and shortest.
3. Explains the use of a ruler.
4. Measures lengths to the nearest inch and records measurement.
5. Measures lengths to the nearest half and quarter inches.
6. Correctly converts inches to feet and feet to inches.
7. Explains the use of a yardstick and notes that a yard is 36 inches or 3 feet.
8. Correctly converts feet to yards and yards to feet.
9. Correctly converts inches to yards and yards to inches.
10. Measures various lengths using either a conventional ruler, yardstick, or tape measure.

A criterion-referenced test on linear measurement would assess the learner's ability on all 10 of these areas, measuring performance against preset criteria. Continuing with the previous example, the teacher discovered Betty's assumed deficit in measurement. Using the task sequence as a guide, he develops problems represen-

tative of the 10 areas for linear measurement. (Task sequences are available for other areas of measurement—see references earlier in the chapter.) Betty's performance on these problems should provide a much clearer picture of her strengths and weaknesses in this area.

Both the Brigance Diagnostic Inventory of Basic Skills (Brigance, 1977) and the Brigance Diagnostic Inventory of Essential Skills (Brigance, 1980) are commonly used examples of commercially produced criterion-referenced tests. These tests cover arithmetic skills from kindergarten through twelfth grade levels and provide teachers with a list of objectives for IEP development that is more thorough than those found in standardized tests.

Teachers may find that with some learners they still need to assess certain areas using their own task sequences as a guide. This will be especially true as teachers move more toward teaching functional, community-based skills. For example, if the goal is to teach students the use of arithmetic for comparison shopping in a local grocery store, commercially produced tests could not provide a valid task sequence for that situation. In this instance a teacher-made test based on a teacher-developed task sequence would be more appropriate.

Error Analysis

Assessment activities become most useful when teachers translate the data into a form that allows student error patterns to emerge. Error analysis allows teachers to pinpoint the computational mistakes being made by students and interpret reasons for the mistakes. A thorough error analysis goes beyond obtaining a score on a standardized test or a grade on a weekly quiz. Error patterns can only be found by carefully analyzing each mistake a student makes, looking for answers to two basic questions: "(1) What is the nature of the error?; (2) What are the most likely causes of the error?" (Wiederholt, Hammill, & Brown, 1983, p. 197).

Retarded learners are often consistent in the mistakes they make, either because they have never learned the rules for completing the problems or because the rules they have learned are being applied in the wrong fashion. Identifying these error patterns is the first step in choosing the instructional strategies to correct the problems. Many error patterns exist in arithmetic, the most common being the four presented by Roberts (1968): (1) using the wrong operation, e.g., student adds when he should multiply; (2) making an obvious computational error, e.g., student adds $2 + 6 = 7$; (3) using a defective algorithm, e.g., student cross adds columns; and (4) providing a random response, e.g., student guesses at the answer using no logical pattern.

Howell and Kaplan (1980) believed that the four areas presented by Roberts did not provide enough examples of common error patterns. They developed a chart based on work from Englehardt (1977) that provides a more complete system of error patterns. Their chart is presented in Table 9.3.

Error patterns can be established by collecting data from three basic sources: (1) mistakes made on problems from standardized tests; (2) mistakes made on problems from commercially produced or teacher-made criterion-referenced tests;

TABLE 9.3 Common Error Patterns

1. Basic fact error.	Use of untrue simple number sentences.	(a) $5 + 2 = 6$ (b) $6 \times 8 = 52$	
2. Incomplete or defective algorithm.	(a) Use of predictable but incorrect procedure.	(a) $\begin{array}{r} 25 \\ 4 \overline{)208} \\ \underline{20} \\ 008 \end{array}$	and $\begin{array}{r} 26 \\ 7 \overline{)434} \\ \underline{42} \\ 14 \end{array}$
	(b) Use of the correct procedure with an omitted or added step.	(b) $\begin{array}{r} 68 \\ +7 \\ \hline 1386 \end{array}$	and $\begin{array}{r} 47 \\ +5 \\ \hline 962 \end{array}$
3. Grouping errors.	Failure to place digits in proper column as required in regrouping.	(a) $\begin{array}{r} 86 \\ +47 \\ \hline 1215 \end{array}$	(b) $\begin{array}{r} 47 \\ \times 9 \\ \hline 42 \\ 36 \\ \hline 78 \end{array}$
4. Inappropriate inversion.	(a) Reversal of a step in an algorithm.	(a) $\begin{array}{r} 52 \\ -17 \\ \hline 45 \end{array}$	(b) $\begin{array}{r} 35 \\ \times 3 \\ \hline 141 \end{array}$
	(b) Reversal of place values.		
5. Incorrect operation.	Use of the wrong operation.	(a) $\begin{array}{r} 4 \\ +2 \\ \hline 8 \end{array}$	(b) $\begin{array}{r} 100 \\ -74 \\ \hline 174 \end{array}$
6. Identity and/or zero errors.	(a) Confusion of zeros and ones.	(a) $\begin{array}{r} 5 \\ \times 0 \\ \hline 5 \end{array}$	(b) $\begin{array}{r} 10 \\ +5 \\ \hline 6 \end{array}$
	(b) Failure to understand the concept of zero.		

Note: From *Diagnosing Basic Skills* (p. 248) by K. Howell and J. Kaplan. Copyright 1980 by Charles E. Merrill Publishers. Reprinted by permission. The authors based this chart on information from "Analysis of Children's Computational Errors: A Qualitative Approach" by J.M. Englehardt, 1977, *British Journal of Educational Psychology*, 47, 149-154.

and (3) mistakes students are in the process of making (Ashlock, 1982). The first two sources of errors can be obtained by teachers in the form of permanent products that can be analyzed without having the student present.

The third source is an important one that is often overlooked by teachers. Asking a student to compute a problem while explaining to the teacher the process being used can provide excellent information about the nature and causes of the error.

Error analysis is a technique that teachers use as "educational detectives," analyzing clues to solve some of the severe learning problems of their students. A high-quality error analysis involves following some simple steps. Howell and Kaplan (1980) have listed six steps that provide a good framework for identifying error patterns in arithmetic:

1. Collect an adequate behavior sample by having the student do several problems of each type in which you are interested.
2. Encourage the student to work, but do nothing to influence the responses the student makes.
3. Record all the responses the student makes, including comments.
4. Look for patterns in the responses.
5. Look for exceptions to any apparent pattern.
6. List the patterns you have identified as assumed causes for the student's computational difficulties (pp. 250–251).

Organizing the data collected from a student's work requires a system that is simple, keeping the information in a systematic format. One of the better systems was developed by Howell and Kaplan, classifying data by the categories stimulus, response, and assumed causes. Table 9.4 provides an example of an error analysis chart for additional problems. Charts such as the one shown in Table 9.4 are most valuable when the teacher watches how the students compute answers to problems and then asks the students to explain how they arrived at the finished product. The information from these informal observations is recorded in the column labeled Teacher Observations and is used to provide a more thorough analysis.



CASE STUDY



"Hi, Bob. How's life for the fifth grade teacher?"

"I've been better, Anne. Some days I can't seem to make teaching work. I guess I don't have the patience you special ed teachers were born with!"

"Give that old myth about special educators having tons of patience a break, Bob. We have no more or less than you regular educators! What's wrong?"

"Well, I have this kid in my class who keeps falling further and further behind in arithmetic. He's staffed into a resource class part of the day with one of your colleagues, but he won't give me any concrete suggestions about what I can do!"

"Well, Bob, interpersonal relations are not my strong suit, so I can't give you suggestions for dealing with the kid's teacher. However, if you tell me the types of mistakes the kid is making I may be able to give some instructional tips."

"Mistakes? What do you mean by types of mistakes? I give my students arithmetic problems and then record their progress by percentage of answers correct."

"That may be the reason why you can't pinpoint this kid's problem! If you have the student's paper in that stack you're correcting, I'll show you what I mean. For example, here the student has missed four subtraction problems on this assignment. The first problem gives us a clue to at least one of his deficits."

"Note what the student's answer was. It leads me to believe that he hasn't grasped the relationship of zeroes in the ones, to tens, to hundreds. He still can't convert from one column to the next."

"By analyzing this problem instead of just marking it wrong, we have gathered information that may lead us to a solution for this deficit."

TABLE 9.4 Sample Error Analysis Chart

Problem Presented	What the Child Writes	What the Child Says (Oral Interview)	Error Analysis Teacher's Hypotheses	What the Teacher Does Next
$\begin{array}{r} 7 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -3 \\ \hline 2 \end{array}$	7 take away 3 = 2	Doesn't know number fact.	Presents same problem in another form (rule out random error). Check other subtraction facts. Provide practice with physical objects, worksheets, number line, flashcards, games, etc. Retest before going to more difficult subtraction.
$\begin{array}{r} 15 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline 11 \end{array}$	6 take away 5 is 1; 1 stays the same.	Faulty algorithm; doesn't understand integrity of minuend and subtrahend; doesn't know number fact.	Check further to see if child always subtracts smaller number from larger. Review addition and subtraction at enactive and iconic level (Bruner) with one-digit numbers, then two-digit. Have child respond orally before returning to written form.
$\begin{array}{r} 85 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ -3 \\ \hline 52 \end{array}$	3 from 8 is 5; 3 from 5 is 2.	Problem worked left to right; problem with place value (subtracting ones from tens).	Review place value at the enactive, iconic, and symbolic levels; provide practice with subtraction algorithm in simpler two-digit problems.
$\begin{array}{r} 85 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ -9 \\ \hline 86 \end{array}$	The 8 goes down here; then you have to change the 5 to 15, then subtract 9 from 15.	Problem worked left to right; doesn't understand effect of regrouping ones on tens	Provide experience with place value—manipulating bundles of straws (1's, 10's, 100's), pocket chart, or Stern materials; then provide workbook pictorial practice. Finally, rework symbolic problem.
Problem Presented	What the Child Writes	What the Child Says (Oral Interview)	Error Analysis Teacher's Hypotheses	What the Teacher Does Next
$\begin{array}{r} 91 \\ -83 \\ \hline \end{array}$	$\begin{array}{r} 91 \\ -83 \\ \hline 1 \end{array}$	Since you can't take 3 from 1, the answer is 1; also because 8 from 9 is 1.	Problem in regrouping; possible problem in number fact.	Review place value (tens and ones); perform several problems of this type on the pocket chart, or with Cuisenaire rods. Provide successful experience on problems of this type before returning to numerical form.
$\begin{array}{r} 523 \\ -284 \\ \hline \end{array}$	$\begin{array}{r} 4 \overset{11}{2} 3 \\ -284 \\ \hline 249 \end{array}$	This 2 (in tens place) should be 12, that makes this 5 a 4. Now $12 - 8 = 4$ and $4 - 2 = 2$. To take 4 away over here (ones column) you make the 3 to a 13; $13 - 4 = 9$; change 12 to 11.	Sequence is the problem here. The child performed all the steps correctly but in the wrong order.	Practice right-to-left sequence in problems not involving regrouping. Use place-value box or chart to show why sequence affects results.
$\begin{array}{r} 300 \\ -157 \\ \hline \end{array}$	$\begin{array}{r} 111 \\ 300 \\ -157 \\ \hline 053 \end{array}$	You have to get ones from the three because there aren't any here (pointing to 0's); 3 take away 2 makes the 3 a 1. Now we have 10 ones, and 10 tens, and we can subtract.	Relationship of empty sets of ones to tens to hundreds a problem. Child doesn't understand conversion from one unity to another.	Provide child with experience in converting tens to ones and hundreds to ones. (It might be very effective to use dollars, dimes, and pennies first; then use the paper-and-pencil mode). First provide practice using only tens and ones, together, then hundreds and tens together, then hundreds and ones together, finally conversions involving all three units in one problem.

Note: From *Teaching Children with Learning and Behavior Problems* (3rd ed.) (pp. 199–200) by D. Hammill and N. Bartel. Copyright 1982 by Allyn & Bacon, Inc. Reprinted by permission.

“OK Anne, you’ve got my attention. What’s the solution?”

“Well, one possibility is to allow the student to practice converting tens to ones using concrete objects such as real money. As he practices with the objects, have him also put the problem and answer on paper. The next step would be practicing hundreds to tens and so on until he consistently gets the idea. If you follow these procedures with a representative sample of the kid’s mistakes you should get a pretty good error pattern, allowing us to make some assumptions about remedial techniques.”

“Anne, I can’t tell you how much this helps. If I can ever do you a favor just ask!”

“Well there is one thing you can do for me, Bob. How about letting me mainstream one of *my* students into your class? Wait, Bob, don’t faint!”

Assessing Community-Based Arithmetic Skills

Hopefully, many teachers of middle- and high-school-age mildly retarded students will assess both their entry behaviors and their later progress toward using arithmetic skills in community settings. Moderately and severely retarded learners benefit from as much practical use of skills as possible. Therefore, arithmetic assessment for these learners may best be accomplished in more realistic settings.

Using money, telling time, and measuring are the arithmetic skills most useful to moderately and severely retarded learners. As teachers increase the time spent in community training, the opportunity to assess these skills in daily living activities increases. For example, a teacher wishing to see how a student reacts when asked to purchase a soda from a machine needs to structure a situation where the student has access to a soda machine. This information is important because some retarded students who are not able to count change in the classroom may be able to purchase a soda from a vending machine.

Vocational training sites in the community are also examples of where arithmetic skills can be assessed. Moderately or severely retarded students working in a nursing home might need to have some time-telling skills to know when certain jobs need to be completed. In this instance, teachers would be interested in two pieces of data.

The first is an assessment of what skills the student had achieved prior to arrival at the work site (e.g., knows that 12 p.m. means lunchtime). The second piece of data is an assessment of the situation for the purpose of developing adaptations that will allow the student to complete the job. For example, if the student could not tell when it was 12 p.m., would an alarm watch set by the supervisor remind the student that at 12 p.m. the trays needed to be delivered to the residents?

PROGRAM SELECTION

Identifying and Analyzing Short-Term Objectives

Once teachers have pinpointed a student's strengths and weaknesses, identification of short-term objectives becomes the next logical step in the instructional process. Knowing a student's strengths helps to identify instructional procedures that may be helpful. A student's weaknesses, on the other hand, can become the content for a short-term objective. For example, a mildly retarded student may demonstrate a severe deficit in addition and subtraction skills. An analysis of the student's errors may pinpoint two areas where the deficit appears most severe: carrying in addition and regrouping (borrowing) in subtraction. Short-term objectives for these areas may resemble the following:

Outcome: The student will correctly compute addition problems involving carrying.

Context: Written problems with paper and pencil. Written problems with calculator.

Criteria: 10/10 with paper and pencil. 10/10 with calculator.

Outcome: The student will correctly compute subtraction problems involving regrouping (borrowing).

Context: Written problems with paper and pencil. Written problems with calculator.

Criteria: 10/10 with paper and pencil. 10/10 with calculator.

Analyzing these objectives for a clearer picture of the subskills is the next step. Skills needed to master the addition and subtraction objectives might be sequenced as follows:

- 1.0 Addition short-term objective
 - 1.3 Carrying from ones column
 - 1.4 Carrying from tens column
 - 1.5 Carrying consecutively from column to column
 - 1.6 Carrying alternately skipping columns
- 2.0 Subtraction short-term objective
 - 2.3 Borrowing in the tens and ones columns
 - 2.4 Borrowing in the hundreds and tens columns
 - 2.5 Borrowing consecutively
 - 2.6 Borrowing alternately

Analysis of short-term objectives generally occurs after IEP development, when the teacher is ready to begin instruction. This procedure allows teachers to organize the skills they wish to teach and keep track of the skills mastered by the student (see Table 9.5).

TABLE 9.5 *Partial Management System for Monitoring Students' Completion of Arithmetic Short-Term Objectives (Numbers Coded to a Master List)*

	1.3	1.4	1.5	1.6	2.3	2.4	2.5	2.6
Bobby	X	X	X		X			
Jovan	X				X			
Susan								
La Ronda	X	X	X		X	X		
Michael	X				X			
Tamara	X	X	X	X	X	X	X	X
John								
Andrea	X							
Phil	X	X						
Sara	X	X	X		X	X	X	
Jamie	X				X			

X=Successful mastery of objective based on criteria located on student's IEP.



KEY CONCEPTS



- Survey-level assessment of arithmetic skills may best be accomplished by using standardized diagnostic tests (e.g., Key Math).
- These instruments provide a fast, fairly reliable estimate of a student's general deficit areas.
- The major weakness of standardized diagnostic tests is their limited sampling of skills. The problems included in these instruments are only representative samples of an area and cannot provide an in-depth analysis of the student's deficit areas.
- Specific-level assessment of arithmetic may best be accomplished by using either commercially produced (e.g., Brigance) or teacher-made criterion-referenced tests or by direct observation of the student's skills in community settings.
- For mentally retarded learners, it is important to assess arithmetic skills both in the classroom and in the community. A general rule might be that the more severe the retardation the more important assessment in the community becomes.
- Error analysis involves determining the nature and possible cause for the types of errors students make.
- Error patterns can result from a number of causes. Most noticeable are choosing inappropriate operations, using a defective algorithm, making computational errors, having language problems, and using random responses.
- Error patterns can be analyzed using information from standardized and criterion-referenced tests and homework assignments, watching the student complete a task, and asking the student how the problem was completed.

- Assessment of a student's arithmetic skills should be as functional as possible. For example, instead of testing a student's knowledge of measurement on paper, a teacher might structure a situation where the student has the opportunity to measure during a cooking activity.

Developing Instructional Strategies

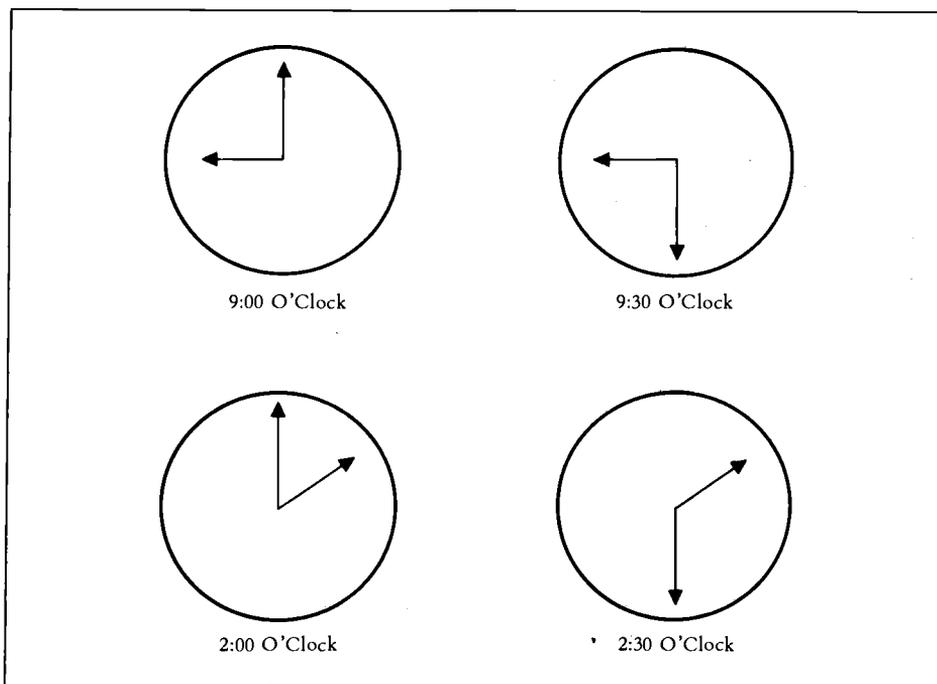
Students' strengths and weaknesses refer to the learning characteristics they exhibit. Generally, retarded learners have problems focusing their attention on specific stimuli, discriminating among stimuli, remembering facts, grasping abstract concepts, and generalizing skills to new situations (Mercer & Snell, 1977). Because retarded learners as a group are heterogeneous, individuals could have problems in all or some of these areas, and assessment procedures should help by pinpointing what areas are important to each student. Instructional strategies will either help to remediate the deficit or help the student circumvent the problem.

Curricular materials can be purchased commercially, made by the teacher, or obtained in the community through donations (e.g., practice check-writing package obtained from a bank). Whether materials are purchased commercially or developed by the teacher, consideration should be given to what techniques are used to help students overcome their deficits.

For example, students with deficits in attention and discrimination may benefit from materials that use color coded key elements, for example, having all the operation signs (+, -, x, ÷) in different colors. This technique helps the students focus on the correct operation by directing their attention to the relevant stimulus while helping them discriminate among operations. A similar technique might use arrows plus color coding to help students direct their attention to the appropriate algorithm.

Understanding abstract concepts can be a formidable barrier for retarded learners, and mastering arithmetic content requires the ability to reason and make complex associations. This problem may be exacerbated if arithmetic skills are only presented to retarded learners in rote fashion. They may learn the operation but not know the related concepts (e.g., adding numbers versus adding sets of objects).

Cawley and his associates (Cawley, 1978; Cawley, Fitzmaurice, Goodstein, Lepone, Sedlak, & Althaus, 1976; Cawley & Vitello, 1972) have suggested a process for teaching arithmetic that addresses the issue of concept development as opposed to teaching rote skills. The model, called the *interactive unit approach*, emphasizes the importance of teacher-pupil interaction. The teacher is required to present the material to the student in four ways: (1) constructing an activity that allows the students to do something; (2) presenting a picture or objects to represent the target concept; (3) saying something, using language to explain the concept; (4) writing something, using written symbols to support the concept (Sedlak & Fitzmaurice, 1981).



■ FIGURE 9.1
Example of Material Cues for Teaching Time-Telling Skills

Each of the four teacher actions requires a corresponding action by the student. For example, a teacher may use a ruler to demonstrate how to measure the length and width of a table. In the process of measuring the table, the teacher also explains what he is doing and then writes down the figures that represent the final product. The student is then asked to repeat the process.

Other authors have highlighted the approach of Cawley and his associates as one that has excellent potential for students having learning problems in arithmetic (e.g., Schulz & Turnbull, 1983; Sedlak & Fitzmaurice, 1981; Smith, 1974). The approach has been incorporated into an arithmetic program entitled Project Math, which will be discussed in the next section. The format of the program allows students to use all of their input modalities to process the content. They *see* the teacher perform the task, *listen* to the teacher explain the task (concept), *do* the task themselves, and finally, *say* what they have done (explain the concept).

The techniques of Cawley and his associates have the added benefit of assisting students with poor memories to remember basic facts that are vital in mathematics. Retarded learners, who often have short-term memory deficits, may benefit from the multiple opportunities to learn a skill or concept. The *doing* component of the interactive approach may help to reinforce students' memorizing of basic facts by allowing them to manipulate objects related to the task or concept (e.g., using blocks to learn addition facts to 10).

Some retarded learners may have great difficulty memorizing basic facts regardless of the techniques used. In these instances, memory aids may be helpful, allowing the student to get past the basic facts and complete more advanced tasks. For example, a student having difficulty learning to tell time might have access to a small notebook that shows pictures of clocks depicting the time by the hour and half-hour with the appropriate notation (see Figure 9.1). This same approach can be used with measurement conversions (e.g., 1 foot = 12 inches), money (e.g., 50 cents = 2 quarters), basic arithmetic operations facts, and multiplication tables. Some retarded learners can spend countless hours memorizing their multiplication tables and still have difficulty in remembering them. If they were allowed to refer to a reference table, they might be able to apply the skill to daily living activities.

Teachers must be careful to use arithmetic terms consistently. Retarded learners can easily become confused when many terms describing the same process are used. Schulz and Turnbull (1983) presented an example of teachers who might use the terms "regrouping, renaming, and carrying to refer to the same concept" (p. 264).

For some moderately and most severely retarded students, learning traditional arithmetic skills may not be the most realistic approach. The goal for these learners is to get them involved in more realistic or community-based activities as soon as possible. Therefore, it is important to use instructional techniques designed to allow students to circumvent their arithmetic deficit and participate in activities. This approach, called *designing instructional adaptations*, allows students to cope in situations where their lack of ability would normally exclude them.

The most obvious adaptation is to design more activities and structure more opportunities for students to learn to use calculators (Russell, 1982). Calculators have increasingly become a need instead of a luxury in our society, and retarded learners can be taught to use them to their advantage. For example, a moderately retarded learner at the middle school level may have a great deal of trouble learning her basic operations. However, this same student may be taught how to use a calculator to compare the prices between two items based on certain characteristics of the items (e.g., weight).

Many older mildly retarded students benefit from increased instruction in the use of calculators for completing daily living exercises (Koller & Mulhern, 1977). By the time these students are in high school, continued drills in basic arithmetic skills may be counterproductive. Instead, activities such as balancing a checkbook, maintaining a budget, and computing taxes can all be taught using the calculator as an adaptive tool.



CASE STUDY



Ms. Joseph, the Director of Special Education, opened the meeting by stating, "We're here today to see if we can identify ways to increase the numbers of mildly and moderately retarded students served by Vocational Education."

Turning pale, Mr. Barnes, the Director of Vocational Education, grunted,

"Now, Ms. Joseph, we've been round on this subject before. I thought we agreed that your students don't have the necessary prerequisites to benefit from our programs. Namely, they can't read, write, measure, and tell time!"

"Granted, Mr. Barnes, our students do have severe learning problems. However, we think we have a solution to the problem. Mr. Adams, our lead teacher for mentally retarded students at the high school, has an idea and I'd like him to explain it. Jim, I'll turn it over to you."

"Well, folks, we realize that some of our students are just not getting the basic skills they need through traditional classroom instruction," said Mr. Adams. "Yet, they have the abilities to perform many of the tasks you teach in your vocational classes, if we can figure out how to get by the academic deficits!"

"Well, I'll be dogged if I can see how a kid can be a part of my carpentry class if he can't measure," said Mr. Rule.

"Our goal for some kids may not be entry level employment, Mr. Rule. We may be only working on ways to help them apply their academic skills in more functional ways. For example, one of our students having trouble with learning linear measurement skills might have a set of samples of commonly cut boards labeled by their sizes. Then, when asked to cut 10 boards measuring 6 feet 6 inches, for example, the student can refer to the sample and either use it to mark the new boards or measure the sample to remind him where 6 feet 6 inches is on the ruler. Over time, we feel he will begin to learn how to measure because he is engaged in a functional, highly motivating task. The added benefit is that our students get valuable training in work-related behaviors, vocational skills, and job sampling!"

"Hmm, I guess I can see what you're getting at," said Mr. Barnes, "but who is going to come up with these ideas?"

"That's the role of our special educators," said Ms. Joseph. "They will work closely with your people and develop a list of potential adaptations."

"Well, heaven knows we have enough regular students who have trouble computing and working with numbers," said Mr. Rule. "Maybe we can use some of these adaptations to help them! I say let's give it a try!"

Programmatic Approaches

A number of commercially produced mathematics programs are available for teaching retarded learners. Many of these programs are based on sound educational principles that gear instruction to the perceived needs of handicapped learners. For example, some provide opportunities for learners to practice skills using multiple modalities. They also provide frequent feedback to the learner and many opportunities to practice the same skill. The following sections present brief descriptions of selected math programs and materials.

DISTAR Arithmetic System

DISTAR Arithmetic (Engelman & Carnine, 1972-1976) is similar to the DISTAR Reading Program in that it is highly structured and sequenced, with the lessons

designed for small groups. The arithmetic skills targeted for instruction cover skills generally taught in kindergarten through third grade. DISTAR I emphasizes ordinal counting, basic addition facts, basic subtraction facts, and simple word problems. DISTAR II presents more advanced addition and subtraction problems, basic multiplication facts, money, measurement, time, and fractions. DISTAR III continues to provide more complex addition and subtraction problems, multiplication, and division as well as more complex story problems.

The DISTAR system has proved to be highly effective for teaching rote skills to younger, lower income children (Sedlak & Fitzmaurice, 1981), and it may be effective for use with some younger mildly retarded students who require consistency and structure. Unfortunately, it does have some weaknesses that teachers must compensate for with additional activities.

Sternberg and Fair (1982) have noted that the DISTAR program does not provide activities that allow students to practice skills in situations relevant to their lives. In addition, the program emphasizes rote skills development over developing math concepts. As students grow older, DISTAR may become less appropriate because of its lack of functional math content.

Project Math

Project Math, developed by Cawley and his associates (1976) is a comprehensive developmental program for teaching kindergarten through sixth grade level math skills. This program is based on the "interactive unit approach" (refer to the section on "Developing Instructional Strategies"), allowing learners to practice skills using the "do, see, and say" techniques. Cawley's (1977) approach was to develop a math curriculum that would allow nonreaders to learn the skills while using as many modalities as possible.

Project Math presents activities in patterns, geometry, sets, numbers, measurement, and fractions. This program is highly flexible, allowing students to use a number of options for presenting answers while encouraging teachers to be creative when presenting questions.

Project Math has proved to be effective with mildly retarded learners and has potential for use with some moderately retarded students. Its major advantage is its relevance, because the program includes activities designed to apply math skills to daily life. Project Math also provides opportunities for students to practice divergent thinking, and problem solving is stressed throughout the program.

The major disadvantage of Project Math appears to be that the program was developed to be self-contained and not supplemental to other programs. Therefore, students mainstreamed into a regular class using another program may be difficult to place into the Project Math sequence of activities.

Essential Math and Language Skills Program

The Essential Math and Language Skills Program (EMLS) (Sternberg, Sedlak, Cherkes, & Minick, 1978) was designed to present skills in a developmental

sequence, stressing concept attainment and then skill training. Activities from the EMLS program cover six areas, including sets and operations, numbers and operations, patterns, part-whole relationships, spatial relationships, and measurements.

The relationship of the skills presented by the EMLS program to daily life is developed by presenting realistic examples. Concepts are presented in conjunction with concrete examples, and students must show that they have grasped the concept before skills are practiced.

A major advantage of the EMLS program is its flexibility. For example, teaching strategies are outlined, but the teacher has a choice of which ones to use based on student need. Also, the program lists a number of potential student responses for each objective, allowing for more divergent thinking on the part of the student.

Real Life Math

Real Life Math (Schwartz, 1977) is a program that presents role playing activities, allowing students to practice applying math skills to daily living activities. Specifically, the program presents simulations of banking transactions, bill paying, and other business related skills.



KEY CONCEPTS



- Instructional strategies directly relate to a student's strengths and weaknesses. These strategies should be designed to help students focus attention, discriminate, improve memory, understand abstractions, and generalize skills.
- Color cues, arrows, underlining, and highlighting are examples of methods to assist students in focusing their attention and discriminating among stimuli.
- Cawley's model, called the *interactive unit approach*, helps learners understand abstract concepts by allowing them to see a model perform the task, practice the task with concrete and semiconcrete objects, verbally rehearse the task, and finally complete the task using only the abstractions.
- Project Math incorporates Cawley's model into a self-contained, commercially produced math program.
- Teachers must use arithmetic terms consistently.
- A majority of mildly and moderately retarded students and some severely retarded students should be well-versed in the care and use of calculators.
- A number of commercially produced math programs are available that incorporate several preferred teaching strategies. When reviewing materials, important questions such as the following should be considered:
 - Does the program allow for practice using multiple modalities?
 - Does the program provide the learner with frequent feedback?
 - Do the program materials use color cues, arrows, etc.?

- Is the program self-contained, or are other materials needed?
- Is the program flexible, allowing for teacher input?
- Does the program incorporate community related activities?

Other Programs and Materials

Accent/Consumer Education

Chicago: Follett Publishing Company

Calculator Activity Book

Educational Teaching Aids

Cuisenaire Rods

New Rochelle: Cuisenaire Co. of America

Developmental Learning Materials for Math

Dallas: Developmental Learning Materials (DLM)

Learning Skills Series: Arithmetic

New York: McGraw-Hill

Mathematics in Daily Living

Austin: Steck-Vaughn Co.

Money Matters

Hayward, CA: Janus Book Publishers

Pacemaker Arithmetic Program

Belmont, CA: Fearon Publishers

Sullivan Programmed Math

New York: McGraw-Hill

Target Math Series

Johnstown, PA: Mafex, Inc.



IDEA FILE



Microcomputers provide students a highly effective way to practice and retain arithmetic skills (Bratt, 1983; Burns & Bozeman, 1981; Hofmeister, 1983). Students who have been bored by or turned off to arithmetic may now be motivated to practice skills by computer that they might shun in paper and pencil format.

Many teachers are familiar with the microcomputer's potential for providing learners with fun activities for drill and practice. Companies are increasingly marketing new software to assist students in this area, and for many retarded learners drill and practice is a key goal. However, microcomputers can be used to a greater advantage, especially for mildly retarded students.

Goldenberg, Russell, and Carter (1984) identified the following three additional uses of the microcomputer for teaching math skills:

1. Provides educational games that allow learners to interact with graphs and models showing mathematical concepts.

2. Provides tools for helping students to organize, record, and visualize information.
3. Provides activities allowing students to explore math in ways not possible using conventional instruction.

Teachers should be aware of the power a microcomputer can have for helping children learn problem solving skills (Hill, 1983). Some experts have traditionally felt that the mentally handicapped as a group inherently had poor problem solving skills. However, with the advance of computer assisted instruction, some professionals are finding that retarded students can solve problems previously not thought possible.

Logo is a computer language that offers a new medium for retarded students to learn self-expression, control over the environment, and a means to positively interact with computers (Hagen, 1984). Basically, the philosophy of Logo is to allow students to create images independently instead of reacting to a prepackaged program.

Logo works by using turtle graphics, in which a cursor appearing on the computer screen is controlled by the student. The turtle (cursor) can be moved forward, back, right, or left, with distances traveled by the cursor controlled by numbers added to the command. Students use the turtle to create geometric designs, and often the design is limited only by the student's imagination. Hagen (1984) has suggested that by working with Logo students begin to develop the ability to sequence events more logically in an atmosphere where there are no right or wrong answers.

If used the way it was intended, Logo has a great potential for assisting retarded students to learn problem solving skills. Children as young as 3 and 4 years old have had great success with Logo, so it would appear that most moderately and many severely retarded students might benefit from interaction with this software.

Hagen's book is an excellent resource for locating suggested software and publishing companies. The following is a partial list of software available to assist in the teaching of arithmetic skills.

- Basic Math Competency Skill Drills*
Freeport, NY: Educational Activities, Inc.
- Edufun Series*
St. Louis, MO: Millilan Pub. Co.
- Micro Series*
Lowell, MS: Hayden Book Co.

IMPLEMENTING INSTRUCTIONAL STRATEGIES

Once teachers have identified the content they wish to teach and the setting where instruction is to take place, the remaining task is to match appropriate methods and

materials to the needs of the students. Methods for teaching arithmetic skills can take many forms. For example, one method is to model the skills used to calculate an addition problem. Other methods are to provide examples of precompleted problems (match-to-sample) on student worksheets, underline key components of an algorithm, color code, or use arrows to note directionality.

Methods for teaching arithmetic skills generally will have three major goals. The first is to assist students in understanding the concept of the skill being taught. The second is to direct the student's attention to the relevant aspects of the task. The third is to increase a student's motivation to complete the assigned tasks.

Some students who find arithmetic difficult to conceptualize may require tangible reinforcers at the outset to assist them in completing assigned tasks. Token reinforcement systems (see Chapter Six) and other types of apparent procedures have proved successful in teaching of arithmetic (e.g., Lovitt & Curtiss, 1968; Lovitt & Esveldt, 1970; Lovitt & Smith, 1974).

In a sense, teaching functional arithmetic skills can be considered a method in itself. A student may be showing little or no success in learning to solve fraction problems on paper. When the teacher alters the approach and teaches fractions in conjunction with cooking skills, the student may demonstrate marked improvement. The functionality of the skill can then be considered a teaching technique.



These students are involved in both concrete and semiconcrete arithmetic activities. (Courtesy of Kay Shaw)

Techniques for Teaching Operations

Teaching operations (addition, subtraction, multiplication, and division) can be a frustrating experience for special educators. This frustration may occur when teachers attempt to teach the operation before the student has a full grasp of the concepts involved. Therefore, teachers should be certain that students have a good grasp of place values and number to object sets before presenting problems dealing with operations.

1. Have students practice with concrete objects such as blocks or straws, placing some in "ones" piles and some in "tens" piles (Sander, 1981). Students can practice placing 10 blocks in the "ones" pile and then placing one block to *represent* the 10 in the "tens" pile. For each skill teachers wish to present, they should consider moving their students from the concrete, to the semiconcrete, and eventually to the abstract level (Reisman, 1982). Therefore, this activity can be repeated using marks on paper in place of blocks (semiconcrete) and finally using numbers in place of either objects or written cues (abstract) (Thornton, 1979).
2. Performance cues (Morsink, 1984) should be used extensively with retarded learners, assisting them in remembering the steps in the operation. For example, a teacher might choose to use colored dots, each dot signifying one of the successive steps to subtracting with regrouping (Bellamy, Greiner, & Butters, 1974; Brown & Bellamy, 1972).
3. Marsh, Price, and Smith (1983) presented an interesting method of assisting students to add and subtract using a semiconcrete technique. They suggested an activity where teachers color code dots on numbers representing their properties. The students then use the dots to count out the answer to the problem.
4. Precision teaching (White & Haring, 1980) advocates the use of timed exercises as a technique to improve the performance of handicapped learners. Children are generally competitive and enjoy trying to "beat" the number of correct problems they can compute per minute. (Additional information about rate can be found in Chapter Four). Prillaman and Abbott (1983) have found that using timed exercises can improve the ability of learners to memorize basic facts (e.g., $6 + 2$ or 5×6).
5. Multiplication facts are often most difficult for retarded students to learn (Cowan, 1978). If many methods of instruction have been tried with little success, the teacher should consider allowing the student to carry a multiplication table for use in community activities. These tables are often given free by banks and are wallet size.
6. Mercer and Mercer (1985) suggested the following trick to teach the difficult-to-learn 9s table. First, the student subtracts 1 from the multiplier and places that number in the tens digit of the answer. The next step involves adding to the number obtained in step 1 until 9 is reached.

$$\begin{array}{r} 9 \times 7 = \underline{63} \\ - 1 + 3 \\ \hline 6 \quad 9 \end{array}$$

$$\begin{array}{r} 9 \times 8 = \underline{72} \\ + 1 + 2 \\ \hline 7 \quad 9 \end{array}$$

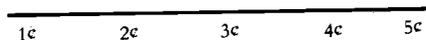
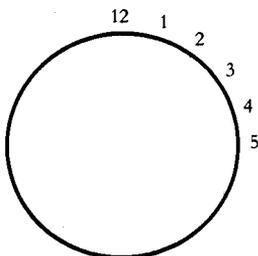
7. Ogletree and Ujlaki (1976) developed an approach for teaching multiplication allowing students to use motor responses such as clapping, stepping, and chant-

- ing paired with the actual operation. For example, students would clap, step rhythmically, and chant the basic times tables. A similar technique was later used with the other operations (Ogletree, 1977).
8. Learning centers allow students to interact with semiconcrete materials depicting various math concepts or functional math applications (Broome & Wambold, 1977). For example, Ashlock (1982) presented a game that incorporates chips whose colors represent various place values. Games such as this can be incorporated into a learning center allowing students to practice math concepts in a less demanding, more enjoyable setting.
 9. The pocket calculator is an effective aid for retarded learners who continue to demonstrate severe deficits in basic operations (Mulhern & Koller, 1977). Students should learn basic care of pocket calculators and how to use them in a variety of situations. Colored marks can be made on the calculator to highlight various signs or cue the learner to the type of operation needed. Calculators that also provide a hard copy printout are now available at relatively low prices. These units can be very helpful to learners because the printout demonstrates the entire operation instead of just providing the answer.
 10. A mini reference book can be developed for students that translates common vocabulary and phrases found in word problems and daily living tasks into operational functions (e.g., "which is cheaper" = subtract; "gives to another" = add).

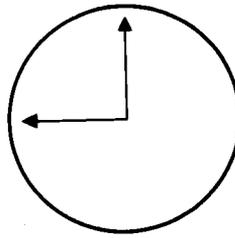
Techniques for Teaching Time and Money

Teaching the ability to tell time accurately and use money both efficiently and effectively are high-priority goals for many retarded learners (Brock, 1979). These skills, more than some others, require intensive training in relation to community and daily school activities. Whenever possible, teachers should start by using concrete events or tasks that students can associate with the skill (e.g., 12 p.m. is lunchtime; 40 cents will buy a soda from a vending machine). Most moderately and severely retarded learners will often associate both time and money with concrete events. Mildly retarded learners can learn to compute time and money problems at the semiconcrete level and eventually move to more abstract activities such as budgeting and time management (Thurlow & Turnure, 1977).

1. Reisman (1982) suggested using a circular number line to help students remember the relationship between minutes and hours. Number lines have also been successful in teaching money skills (Frank, 1978).

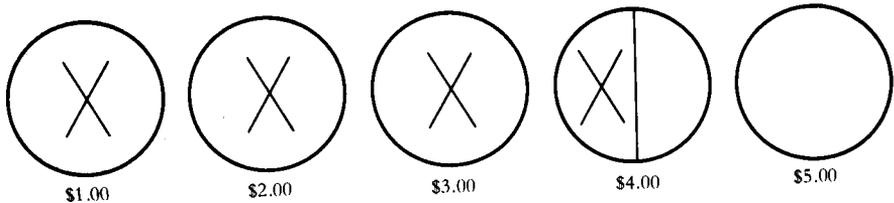


- Students can develop a time log, pairing drawing of certain times with a common activity.



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- Standard clocks can be paired with digital clocks for as many activities as possible.
- For some moderately and severely retarded learners, telling time to the minute may not be an appropriate goal. Snell (1983) reported a procedure developed by O'Brien at Southern Illinois University that taught retarded learners to tell time by the quarter hour and then say, "it's about" to the nearest 15 minutes.
- Mercer and Mercer (1985) have suggested the use of money cards to teach making change. Teachers can develop a card that helps students estimate the amount of change they should receive. For example, a student shopping with \$5.00 can carry a card with five circles, each representing \$1.00. If the student spends \$3.50, the student marks three circles and part of a fourth, leaving one whole and part of one circle left. This cues the student that \$1.00 and some change should be received in return for the \$5.00.



- Task analyzing time-telling and presenting students with single small steps has proved to be effective (Barcott, 1973). For example, a first step is counting minutes on a clock. This must be mastered before a student can move on to the next step of counting minutes by fives (Finkel & Zimmerman, 1976).
- Bellamy and Buttars (1975) successfully taught moderately retarded students to count change by first teaching them rote counting skills. Although these skills were not taught in functional settings, the methods of task sequencing and use of picture cues to help the students match coin equivalents proved to be successful.
- Paying younger students with real money for classroom activities can be an effective prerequisite to teaching more advanced money management skills (Langone, 1981). As students gain these skills, more advanced ones (e.g. check-book, banking) can be taught using larger amounts of money (Orr, 1977). Money for these activities can be obtained from donations and class money-making projects.
- Wheeler, Ford, Nietupski, Loomis, and Brown (1980) presented a comprehensive program designed to teach retarded learners to use calculators when shop-

ping. Basically, the skills were task analyzed and translated into objectives that would allow students to practice the skills in natural settings. Students were taught to label, locate, and obtain a variety of grocery items. In addition, they were taught to use pocket calculators to add the total amount for the nontaxable food items they obtained and subtract the total from the amount of money they carried. These skills were taught using cues and correction procedures such as modeling, verbal correction using direct and indirect cues, gestural cues, and pictorial cues. Similar techniques have proved successful in other studies (Smeets & Kleinloog, 1980).

10. Chaining subskills together to form more complex coin equivalency skills has also proven effective (Trace, Cuvo, & Criswell, 1977). Students were taught to link behaviors such as locating the vending machine, selecting an item, and choosing the appropriate coins. Similar techniques involving chaining, cueing, and reinforcement have also been successful in teaching coin equivalency (e.g. Borakove & Cuvo, 1977; Lowe & Cuvo, 1976).
11. Students appear to learn money skills faster when the objectives are paired with naturally occurring contingencies. For example, programs to teach money skills have been successful when paired with other independent living skills such as eating at restaurants (van den Pol, et al., 1981) and shopping skills (Nietupski, Certo, Pumpian, & Belmore, 1976).

Techniques for Teaching Measurement

Teaching measurement skills to retarded learners can be facilitated when a majority of instruction involves activities allowing students to manipulate objects. Therefore, activities such as cooking and those related to vocational tasks lend themselves to measurement instruction (Schwartz & Budd, 1983).

1. Volume, weight, and linear measurement may best be taught using as many concrete materials as possible (Polloway, Payne, Patton, & Payne, 1985). For example, when changing measures or comparing weights, the use of actual materials may help the students grasp the concepts of more and less, heavier and lighter.
2. Activities that allow students to explore novel materials or activities that result in a product may help students learn the skills for functional use. For example, Aiello (1976) allowed students to use tools while learning the metric system. Similarly, Miller (1978) taught metrics to EMR students while constructing projects in a shop class.
3. Having students constantly compare metric measurements with English measurements helps them to at least be able to compare units visually (Sengstock & Wyatt, 1976). The basis for teaching metrics is to be sure the students have thoroughly learned the English system before the comparison process is taught (Etlinger & Ogletree, 1978).
4. Students appear to learn measurement skills best when they are paired with activities that interest them. Therefore, measuring objects found around the home and measuring in relationship to cooking appear to be highly motivating methods for teaching (Marpert and Prentky, 1974).

5. Color coding and pictorial cues can be effective for teaching measurement skills. They are also effective adaptations for assisting students in learning more advanced home management and vocational skills if they have not been able to learn to measure. For example, a moderately retarded learner may be able to participate in an agricultural vocational education class learning the skills of a feed lot hand if color coding is used to help him learn to mix cattle feed (Langone & Gill, 1984).



KEY CONCEPTS



- Methods for teaching arithmetic skills should help students understand the concepts and motivate them to succeed.
- Token reinforcement systems have been successful in motivating students to succeed in arithmetic.
- Functional or community-related math skills are themselves highly motivating to students.
- Students should begin with concrete activities, moving to semiconcrete and then on to abstract activities.

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DESIGNING INSTRUCTION FOR INDEPENDENT LIVING SKILLS (ILS)

■ Living in the United States brings people in continual contact with the word “independence” and, more specifically, the concept embedded within the word “independence.” Unfortunately, in a country whose leaders and citizens pride themselves on their ability to be independent, there exists a segment of the population that has never enjoyed the freedom from control by others. Mentally retarded citizens have traditionally been relegated by society to a position of dependence, relying on others for their daily existence. The large number of mildly retarded individuals who do integrate into the community often do so at the low end of the socioeconomic scale. In a sense, it can be argued that these individuals, living at or below the poverty level, also have their independence severely curtailed.

As with previous chapters, the discussion of developing curricular areas in independent living skills (ILS) is based on the process approach emphasized in the first half of this text.

DESIGNING THE ILS CURRICULUM: THE IEP

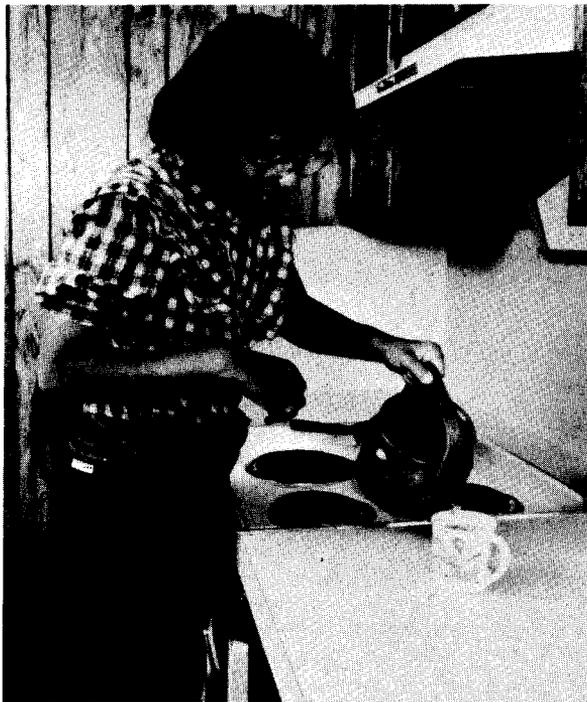
Step One: The Community Needs Assessment (CNA)

The CNA is an important first step in developing ILS programs. This task helps practitioners identify the types of ILS that may be required of learners; the specific

community characteristics that will require program adaptations (e.g., lack of a mass transit system); and the community's resources in the form of people, training sites, and materials. At this first level of curriculum development the task is to analyze the environments where the students live or may live in the future in relation to each of the areas in an ILS curriculum. Students' living arrangements (e.g., in a group home or independent community apartment), where they work or spend their leisure time, and any other environment where self-care skills are needed may be important.

There are a number of tools that can be used to gather CNA data including questionnaires, interviews, and observations. Gathering information about ILS is generally best accomplished by going out and *observing* the environments in which students are or will be functioning. For example, a student taught to cook using an electric stove will have obvious problems if his parents have a gas stove at home. Similarly, another learner who was taught to find grocery items in one store may have little hope of finding those same items in another retail establishment.

The first technique of organizing the CNA is to list under each of the areas of interest the potential environments where students may be expected to demonstrate these skills (see Table 10.1). This step helps identify the environments that



Mastery of Independent Living Skills (ILS) increases self-esteem. (Courtesy of DLM Teaching Resources, Allen, Texas)

TABLE 10.1 Identifying Potential ILS Environments

<i>Self-Care</i>	<i>Home Management</i>	<i>Community Mobility</i>	<i>Consumer Education</i>	<i>Sex Education</i>
<i>Eating</i>		<i>Walking</i>	<i>Grocery Stores</i>	<i>Hygiene</i>
At home	Present Home	Neighborhood	Supermarkets	Home
At school	Future Home	Downtown	Neighborhood stores	School
Fast food restaurants	With relative	Different neighborhoods	<i>Department Stores</i>	Group home
Restaurants	Group home	Shopping areas		<i>Interpersonal Relationships</i>
<i>Toileting</i>	Independent apartment	<i>Bicycle Riding</i>	<i>Shopping Centers or Malls</i>	Community functions (e.g., dances)
Home		Neighborhood	<i>Insurance Companies</i>	Home
School		Downtown	<i>Auto Sales</i>	
Group home		Different neighborhoods		
Community leisure areas		Shopping areas		
<i>Dressing and Grooming</i>		<i>Mass Transit</i>	<i>Appliance Stores</i>	
Home		Intracity bus		
School		Intercity bus		
Group home		Taxis		
Independent apartment		Subways		
		<i>Automobiles</i>		
		Driver training across different community locations		

will eventually require a task analysis. Using parents, other teachers, and community members as resources, this first technique can often be accomplished by sitting down and brainstorming ideas.

The second technique involves taking each of the environments identified in Table 10.1 and deciding in which locations within each environment the desired skills will be demonstrated. A mildly retarded learner learning to eat at restaurants would be required to demonstrate a number of skills in different locations in a restaurant (e.g., communication with waiter and cashier, eating skills at table). For a severely retarded learner, the location for teaching eating skills in school may simply be the cafeteria.

Each environment can be broken down into what Brown, and his colleagues (1979) have called "subenvironments," defined as locations within the main community environments that demand different skills. In the examples just cited, the communication with the waiter in a restaurant requires somewhat different skills from those required in paying the cashier. Thus, the location of the tables in the restaurant would be considered one subenvironment while the location of the cashier would be another.

Step Two: Analyzing CNA Information

CNAs are important because ILS are often unique to different communities. Shopping in a grocery store in Georgia can be different in some ways from shopping in a store located in New York. Those differences may be great enough to confuse a retarded learner, thus requiring a separate analysis of each environment. Similarly, two different homes in the same town may have enough different stimuli to confuse retarded learners who have been taught in only one location. For

TABLE 10.2 Identifying Locations for Task Completion: Self-Care

Environment:	Home
Skill Area:	Self-care
Skill #1:	Eating
Locations:	Kitchen
	Dining room
	T.V. room (snacks)
Skill #2:	Toileting
Locations:	Bathroom (downstairs)
	Bathroom (upstairs)
Skill # 3:	Dressing/grooming
Locations:	Bathroom (downstairs)
	Bathroom (upstairs)
	Bedroom

example, teaching the home management skill of dishwashing may be noticeably different for the student whose home has a dishwasher as compared to one whose home does not have that appliance.

A second category of information obtained from the CNA involves identifying potential community resources. Table 10.3 presents one example of how community resources for consumer education can be identified. In this example, both people and places are the targeted resources. An actual CNA would list names of people and places unique to each community. For instance, mildly retarded learners may find it difficult to deal with high-pressure sales tactics and may buy things they either do not need or cannot afford. A teacher can find a volunteer salesperson who is willing to help learners develop strategies to negate those tactics. The salesperson might attend class and participate in role playing activities, followed by visits to the store and practice in the community setting.

Step Three: Identifying Potential Annual Goals

Annual goals are a direct result of information discovered in the CNA. ILS goals should reflect the real needs of retarded learners to become independent or semi-independent people. Step three is an attempt to identify all *potential* annual goals

TABLE 10.3 *Identifying Locations for Task Completion: Community Mobility, Walking*

Environment:	Neighborhood
Skill Area:	Walking
Skill #1:	Using sidewalks
Skill #2:	Street crossing
Skill #3:	Reading signs
Skill #4:	Using landmarks
Locations:	All sidewalks within two blocks of student's home
	Four-corner intersections with traffic light
	Four-corner intersections with control signs (e.g., Stop, Yield)
	Four-corner intersections with no control
Environment:	Downtown
Skill Area:	Walking
Skills #1-4:	Same as above
Locations:	All sidewalks downtown
	Four-corner intersections with traffic light
	Four-corner intersections with control signs (e.g., Stop, Yield)
	Four-corner intersections with no control
	Five-corner intersections with traffic light
	Crossing at bus stops

that *may* benefit retarded students. Identifying specific annual goals comes later and is based on assessed student needs.

An unlimited number of potential annual goals can be associated with ILS. The types of annual goals written depend upon the individual situation of each teacher and the students in a given community. The potential annual goals listed here are examples that teachers might choose to use as starting points in developing their own ILS curriculum.

SELF-CARE

Eating

Mildly Retarded

1. Demonstrates appropriate table manners.
2. Eats neatly.
3. Orders food in a variety of restaurants.
4. Demonstrates nutritional eating habits.

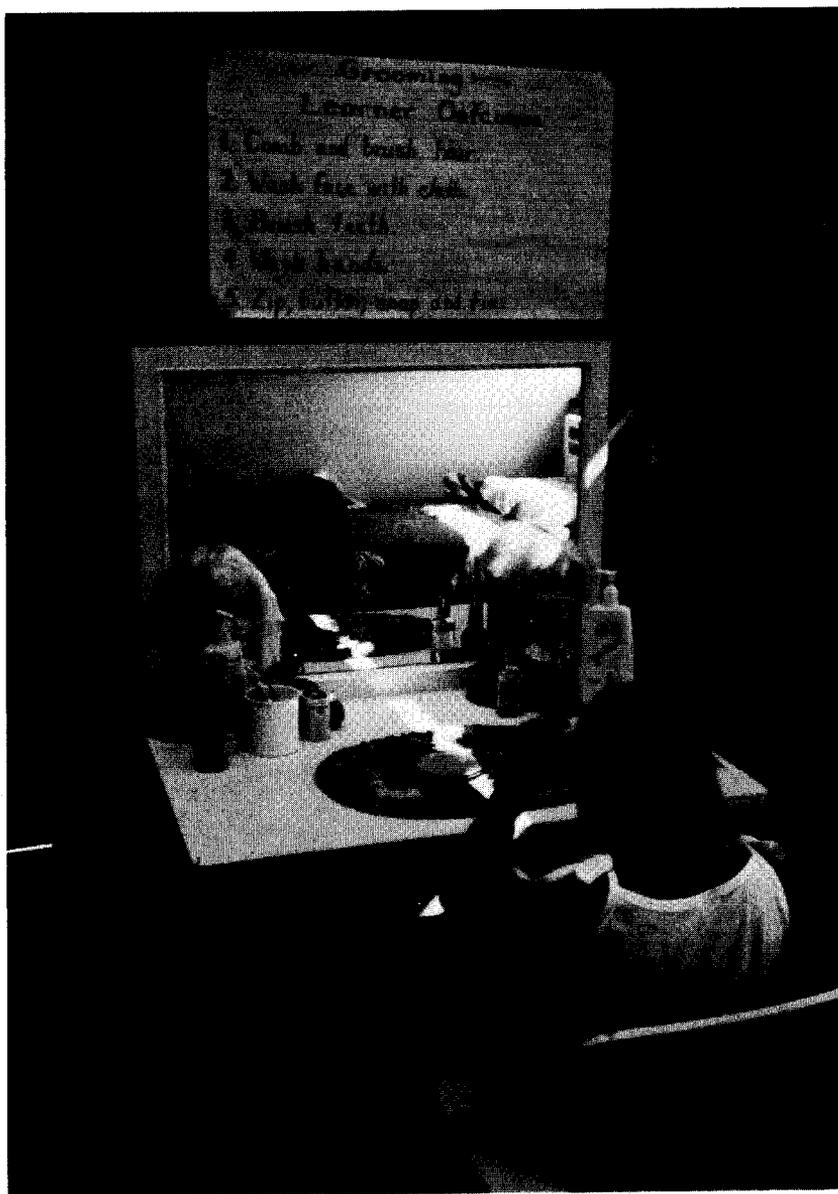
Moderately Retarded

1. Demonstrates appropriate table manners.
2. Eats neatly.
3. Orders food in a variety of restaurants.
4. Demonstrates nutritional eating habits.
5. Uses utensils appropriately.
6. Drinks from a variety of containers.
7. Eats a variety of finger foods appropriately.

Severely Retarded

1. Takes blended food from a spoon.
2. Demonstrates voluntary tongue control.
3. Chews solid food.
4. Learns to suck from a straw.
5. Uses utensils with adaptive equipment.
6. Orders foods in a restaurant using picture cards.

Toileting



Students are successful when they systematically learn grooming skills. (Courtesy of Kay Shaw)

Mildly Retarded

1. Indicates need to use the bathroom.
2. Uses bathroom facilities appropriately.

Moderately Retarded

1. Indicates need to use the bathroom.
2. Uses bathroom facilities appropriately.
3. Appropriately uses bathroom facilities other than those familiar to the student.

Severely Retarded

1. Communicates, by any means, the need to use the bathroom (signing, gestures, pictures, verbal, or any combination).
2. Independently completes as many steps on the toileting task analysis as possible.

Dressing and Grooming

Mildly Retarded

1. Chooses clothing appropriate for weather conditions and activity (e.g., job interview).
2. Chooses articles of clothing that match each other in color, style, and design.
3. Bathes and showers in a number of different facilities.
4. Uses an electric razor appropriately.

Moderately Retarded

1. Chooses clothing appropriate for weather conditions and activity (e.g., job interview).
2. Chooses articles of clothing that match each other in color, style, and design.
3. Bathes and showers in a number of different facilities.
4. Uses an electric razor appropriately.

Severely Retarded

1. Any of the above.
2. Puts on or takes off pullover shirt.

3. Puts on or takes off buttoned shirts.
4. Puts on or takes off pants, manipulating the zipper and snaps.

HOME MANAGEMENT

Mildly Retarded

1. Demonstrates the ability to paint interior and exterior parts of a house.
2. Can appropriately clean a house.
3. Can do basic landscaping tasks.
4. Demonstrates the ability to plan and cook balanced meals.
5. Demonstrates the ability to care for infants and young children.
6. Can choose and call a repair person for appliance and home repairs.

Moderately Retarded

1. Demonstrates the ability to paint interior and exterior parts of a house.
2. Can appropriately clean a house.
3. Can do basic landscaping tasks.
4. Demonstrates the ability to plan and cook balanced meals.
5. Properly stores unused food.

Severely Retarded

1. Participates in cooking and cleaning activities.
2. Demonstrates ability to perform independently as many home management skills as possible.

COMMUNITY MOBILITY

Mildly Retarded

1. Can successfully use all forms of public transportation (both inter- and intra-city).
2. Can learn to safely drive a car and obtain a driver's license.
3. Demonstrates ability to negotiate all types of street corners as a pedestrian.
4. Demonstrates the ability to read and follow city, state, and interstate maps.

Moderately Retarded

1. Can successfully use all forms of intra-city public transportation.
2. Demonstrates the ability to negotiate all types of street corners as a pedestrian.
3. Demonstrates the ability to independently get from home to work, home to leisure/recreation activities, etc.

Severely Retarded

1. Can independently move from one area of the home to another.
2. Requests assistance in moving from one place to another.
3. Can independently ride a bus from point A to point B.
4. Can cross controlled street corners.

CONSUMER EDUCATION

Mildly Retarded

1. Can appropriately handle high-pressure sales techniques.
2. Demonstrates ability to lodge a complaint against unfair selling practices, product failure, or warranty agreements that have not been met.
3. Can seek assistance from consumer affairs offices at the state and local levels.
4. Can develop and follow a budget.

Moderately Retarded

1. Can appropriately handle high-pressure sales techniques.
2. Seeks an advocate to assist against unfair sales practices, etc.
3. Can follow a basic budget.
4. Can conduct a basic cost comparison.
5. Discriminates between store brands and national brands if the store brands are cheaper.

Severely Retarded

1. Can locate items in a store using a series of pictures.
2. Communicates with cashier, asking whether returned change is correct.
3. Discriminates between store brands and national brands.

HEALTH AND SEX EDUCATION

Mildly Retarded

1. Understands sexual functioning.
2. Understands the use of a variety of contraceptives and their relative effectiveness.
3. Identifies symptoms of venereal disease and can seek out treatment.
4. Understands the birth process.
5. Can read and follow directions on medicine containers.
6. Knows basic first aid.
7. Maintains basic cleanliness.

Moderately Retarded

1. Understands sexual functioning.
2. Understands the use of a variety of contraceptives and their relative effectiveness.
3. Identifies symptoms of venereal disease and can seek out treatment.
4. Understands the birth process.
5. Can read and follow directions on medicine containers.
6. Knows basic first aid.
7. Maintains basic cleanliness.

Severely Retarded

1. Participates in maintaining basic cleanliness.
2. Refrains from masturbating in front of others.

Step Four: Translating Goals into Potential Short-Term Objectives

Annual goals are written in general terms. The next step is to translate annual ILS goals into potential short-term objectives that are measurable and can be used as a "yardstick" to assess the students' present level of performance. The *translation* requires that the skill areas of interest be converted into a form that includes the *outcome* or skill, the *context* under which the skill will be assessed, and the *criterion* against which the student will be evaluated.

For example, a short-term objective might look like the following:

Outcome: The student will appropriately order a meal, eat the meal, and pay the cashier.

Context: Three different restaurants.

Criterion: 100% of the crucial steps on the restaurant task analysis.

In this example, after task analyzing the skills required to be successful in the target restaurants, the teacher can then assess the student against the stated criterion. For the purpose of assessing present level of performance, the teacher may have assessed the student in only one restaurant. The other two would be used to generalize the student's skills across different settings at a later date.

The following are examples of some ILS short-term objectives. Short-term objectives should be written in relation to community-valid skills.

Self-Care

Outcome: The student will wash and blow dry hair with no assistance.

Context: At home and at school.

Three different shampoos and containers.

Two different types of blow dryers.

Criterion: Successful completion of all steps on the task analysis.

Home Management

Outcome: The student will wash and dry clothes with no assistance.

Context: At group home.

At school.

Two different makes of washers and dryers.

Criterion: 100% completion of task analysis.

Community Mobility

Outcome: The student can successfully move from home to work using the subway.

Context: Subway system.

Pay station.

Criterion: Arrival at destination within 20 minutes of leaving home.

Consumer Education

Outcome: The student can lodge a complaint to the appropriate person at a department store.

Context: Torn shirt or pants.

Uses a card on which notes were made previous to the meeting.

Criterion: Successfully states all points written on student "complaint card."

Health and Sex Education

Outcome: The student can match the names of contraceptives with corresponding pictures and can list them in order of relative effectiveness.

Content: Pictures and flash cards.

Criterion: 100%

Step Five: Assess Student Entry Behaviors

In some instances, inappropriate tools for assessing ILS may be used. Teachers may use adaptive behavior checklists as the sole determinant of present level of performance. The use of adaptive behavior checklists (e.g., Vineland Social Maturity Scale, Doll, 1984; AAMD Adaptive Behavior Scale, Nihira, Foster, Shellhaas, & Leland, 1974) is appropriate as a screening device and to get input from parents. However, they fall into the realm of *survey level assessment*, and their information should be treated as general data requiring more specific analysis.

The Balthazar Scales of Functional Independence (Balthazar, 1971), although still considered an adaptive behavior scale, provides a more detailed profile of a student with somewhat less subjectivity than the others. For example, these scales rate a student across a number of skills within a general ILS area (e.g., eating: finger foods, spoon usage, fork usage). Scores are obtained by a weighted procedure (e.g., score of 5 for filling a fork independently), and a student's final profile reflects varying levels of independence in any given skill area.

Teachers can develop their own assessment devices, which often will be more useful and meet the criteria for *specific level assessment*. Use of the *task analysis* as an assessment tool reflects actual materials found in the school or community setting, which makes this approach more realistic to the student and teacher.

Steps Six and Seven: Identifying Short-Term and Instructional Objectives

The decision as to what goals and objectives are to be included on a student's IEP is based on two sources: the assessment of present level of performance and the community needs assessment. The community needs assessment (discussed earlier) generates information such as parent and community opinions concerning what skills are important. These can be used as guidelines for choosing specific objectives.

Since the short-term objectives on the IEP cover longer periods of time, it is necessary to break these objectives down into more manageable units of instruction (instructional objectives or subskills) that can be taught on a daily basis. Once again, the tool that assists teachers in accomplishing this step is the task analysis. The key to developing effective task sequences for ILS lies in the validation of the

TABLE 10.4 Examples of the CNA Analysis

<i>Skill Area</i>	<i>Adaptations</i>	<i>Materials</i>
Eating	Utensil holders Food guards Add-on to table (accommodate wheel chair)	
Home management	Ramp to enter house Remote control switches to control appliances	Picture recipes Powder and liquid cleaners
Consumer education		Calculators Picture cards for shopping list

skill breakdown. Specifically, teachers should consider validating their task analyses by allowing others who specialize in an area to review the document.

For example, Johnson and Cuvo (1981) had a home economics professor and a graduate student who specialized in foods and nutrition review their task sequences in cooking. To further validate their work, they also consulted cookbooks and community members who were cooking specialists.

The principle of community validation can easily be transferred to other areas of ILS. For example, developing a task sequence for crossing a high-traffic, controlled intersection can be accomplished by videotaping others crossing the street or simply by observing and carefully recording the steps it takes to safely cross the street.

Specialists in the area of sex education, drug abuse, consumer affairs, and many other areas can all be of service when validating skill sequences or teaching units. Physical and occupational therapists can be of great help when a task sequence needs to be modified to accommodate a retarded learner who also suffers from a physical handicap.



KEY CONCEPTS



- A community needs assessment (CNA) helps determine the types of independent living skills retarded students need to be independent in their current and future environments. A CNA can help identify the skills needed by the student to prepare food at home (currently) and at a local group home (future).
- The principle of “partial participation” is important (Brown, et al., 1979). The principle dictates that independence is enhanced when adaptations to a skill sequence allow a learner to at least “participate” in the activity. A severely retarded learner whose physical handicap minimizes use of his hands may participate in shaving

himself if the electric razor is fixed in a holder and bolted to a face-high bracket, allowing him to rub his face against the razor.

- Potential annual goals and short-term objectives are identified as a result of asking the question, "What are the skills retarded learners need to function independently in community environments?"
 - Students' entry behavior is assessed by comparing their performance against the outcomes, contexts, and criteria of the potential short-term objectives.
 - Deciding which short-term objectives are to be included on a student's IEP is the job of the IEP committee. The criteria for deciding which objectives to teach first vary. A general rule of thumb is to choose those objectives which have an immediate impact on the student's level of independence.
 - Once the IEP section concerning independent living skills is developed, the teacher uses the process of task analysis to identify the subskills that will be used as instructional guidelines on a daily basis.
-

Step Eight: Developing Instructional Strategies

Techniques for Teaching Independent Eating Skills

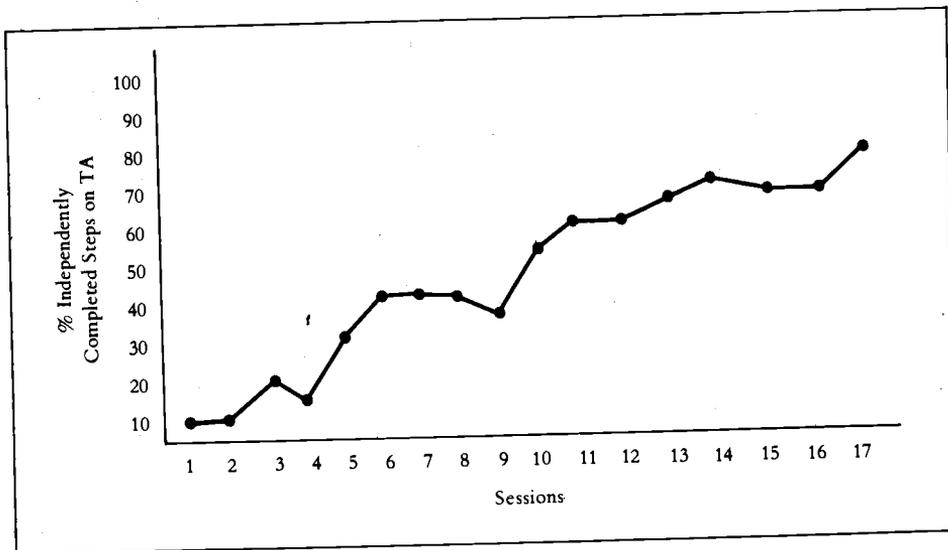
1. Choose the most appropriate teaching technique for use with a given learner depending on the present level of functioning of the student. Generally, a systematic use of teaching methods that include verbal directions in conjunction with modeling, prompting, and the various forms of manual guidance will suffice. However, the key is *systematic*, fading each form of assistance as it becomes obsolete (Berkowitz, Sherry, & Davis, 1971). For example, teachers would expect to use a great deal of manual guidance (e.g., guiding the learner's hand through the task) at the beginning of instruction in basic eating skills. Over time, the use of manual guidance should decrease and more prompts should be used (e.g., touching the student's hand to get him or her to pick up the fork). As a student responds to one level of antecedent teacher behavior, a more sophisticated level will take its place (e.g., modeling and verbal directions).
2. One problem with teaching eating skills to retarded learners is that there are so few chances during the day to teach the skills. Azrin and Armstrong (1973) solved this problem by initiating the "minimeal" approach, dividing larger daily meals into small hourly portions allowing for additional training. This approach allows the teacher (who in many cases can be an aide, volunteer, or peer tutor) to instruct the learner five to six times during the school day instead of once at lunchtime. If the minimeal plan is not possible, a good time to teach basic eating skills is approximately 10 to 15 minutes before the scheduled eating time. The students are hungry, and the food becomes a more powerful reinforcer for contingent behaviors (e.g., use of a fork).
3. Teaching students to drink appropriately from a cup may require multiple trials during the school day. Teachers may wish to program four or five trials of 3- to 5-minute durations using an aide to assist the student through the task sequence for this skill.

4. Once the data have been obtained, they should be converted into a format that can be charted. For example, of the total number of steps in the task analysis, the student was able to independently complete what percentage of those steps (Figure 10.1)?

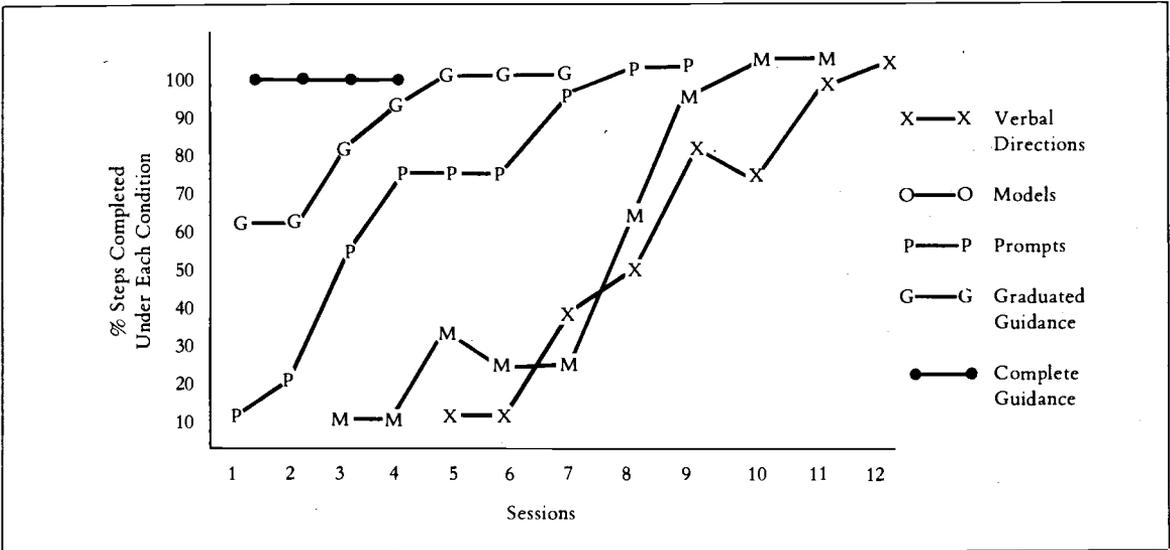
A second technique for data analysis is to chart the percentage of the type of teacher behavior required to assist the student to complete a step (Figure 10.2). A student who is at a lower level of functioning may require a high percentage of total guidance by the teacher at the beginning stages of instruction.

A final charting technique is used on those occasions when assessment and teaching are too closely linked to separate the functions (Figure 10.3). In such cases, the teacher can record the number of instructional trials required before the learner meets criterion for any one step on the task analysis. If a particular instructional technique is successful, the number of trials to criterion should decrease over time.

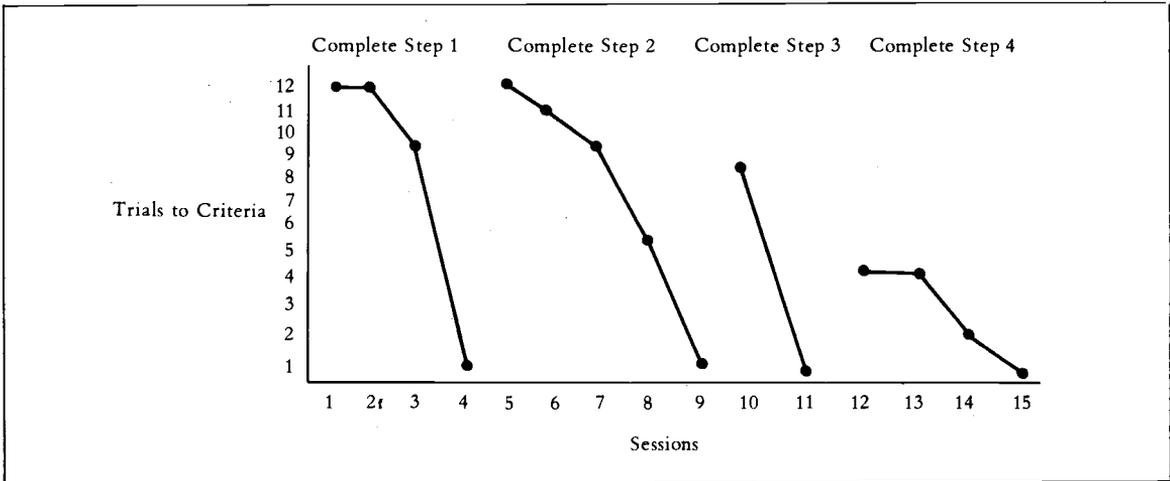
5. It is important to identify the best reinforcers for a target student. In most cases, the best reinforcer is the food itself; however, this should not be the only one used. Appropriate social reinforcers such as smiles and touches can be used to coincide with the primary reinforcer of food.
6. Teachers who work with the profoundly retarded often find themselves "feeding" the learner instead of teaching feeding skills. This situation is prevalent in programs housed on the grounds of state institutions where large numbers of these students reside and attend school. In these cases, the first and foremost task is to work out all attitude problems between teachers, direct care staff, and aides. Many of the learners will still be exhibiting primitive reflexes such as tongue



■ FIGURE 10.1
Chart of Percentage of Independently Completed Steps



■ FIGURE 10.2
 Chart of Teacher Behaviors Required to Elicit Student Response



■ FIGURE 10.3
 Chart of Number of Trials Required for Each Step in Sequence

thrusting, inhibiting progress toward developing any self-feeding skills. The elimination of these reflexes will be a priority. The philosophy that most profoundly retarded learners will never be able to feed themselves independently may not be appropriate. If learners can be taught to swallow and chew, the variety in types of foods that they can then eat (even if fed by a caregiver) makes them more independent than they once were.

7. Some retarded learners also are afflicted with severe physical disabilities. Their teachers should consult with occupational and/or physical therapists to assist with the assessment of eating skills. For example, a classroom teacher may not be familiar with techniques for positioning a learner who suffers from cerebral palsy. A physical therapist could demonstrate this as well as how to use assistive devices for eating (e.g., plate guard).
8. For severely and profoundly retarded learners who are at the most basic of skill levels, assessment of four areas will be crucial: identifying the best position for feeding and instruction in eating given the pupil's physical needs; identifying techniques to teach appropriate sucking skills; identifying methods to teach proper swallowing; and targeting techniques to teach chewing (Stainback, Healy, & Stainback, 1977).
9. At times, teachers will need to develop behavioral programs designed to eliminate disruptive behaviors during mealtime (e.g., stealing food, stuffing mouth, eating with fingers). In cases such as these, timeout (removing the food) has been shown to be an effective method for changing the behaviors (Barton, Guess, Garcia, & Baer, 1970; Riordan, Iwata, Finney, Wohl, & Stanley, 1984).
10. During the entire process, all data should be recorded and charted to monitor program success. For instance, if a learner is exhibiting a disruptive behavior such as throwing his food, the teacher using a verbal reprimand plus timeout for 2 minutes (removal from the group) would keep a record of the instances of food throwing. If the number of instances of the target behavior stayed the same or increased over a reasonable period of time, a change in the intervention would be required.
11. A problem may arise when teachers assume that once a student has learned a skill the skill will be maintained in the presence of the food as a reinforcer. O'Brien, Bugle, and Azrin (1972) found that this is not always the case. In their study a retarded child, taught to eat properly with a spoon, reverted to eating with her fingers. The researchers had to incorporate various "motivational procedures," in this case stopping the incorrect response while rewarding the correct one, in order to maintain the learned skill. Teachers should plan frequent probes, even after the skills have been learned, monitoring the behavior over time.
12. Restaurant eating skills should be taught in the community. Marholin, O'Toole, Touchette, Berger, and Doyle (1979) were successful in teaching moderately and severely retarded adults how to travel to, order a meal, and eat at McDonalds. Van den Pol and colleagues (1981) had similar success in teaching mildly and moderately retarded students to eat in fast food restaurants and then generalizing those skills to other restaurants. Normalizing mealtimes by using family-style dining has improved the eating behaviors of some students (Wilson, Reid, Phillips, & Burgio, 1984).

Materials. There are many commercially available adaptive devices designed to assist handicapped learners during eating. Generally, these adaptive devices can be found in educational equipment catalogs. They include such items as the following:

Utensil holders. These are designed to facilitate a better hold by slipping the entire hand through the holder or by wrapping a ring around the fingers to hold the utensil firm.

Contoured dishes and food guards. These allow the students to scoop foods against the side of the dish.

Adaptive cups and holders. These include weighted cups to reduce spilling, cup holders, and cups with controlled openings.

Sandwich holders. These allow students with minimum use of their arms to eat sandwich independently.

Techniques for Teaching Toileting Skills

The first task is to decide what criteria must be met for a student to be toilet trained. Initially, the important criterion of developmental level must be considered (Snell, 1983). Suggestions for when to begin toilet training retarded learners are somewhat conflicting, but there are some guidelines that teachers can use. Foxx and Azrin (1973a) have suggested that moderately retarded children be at least 2½ years old chronological age and that more severely retarded children be older (approximately 5 years old chronological age). Mildly retarded learners are more likely to follow developmental patterns resembling those of their age peers and can begin training around 2 years of age.

There are a number of other criteria that teachers can use to compare against a student's present level of performance. A student's ability to get to the bathroom independently or with minimal assistance is an important consideration. Fine motor skills, attention span, and level of communication are all important criteria for determining when to begin the program. For example, if a learner does not possess the fine motor skills required to dress and manipulate buttons and zippers, these skills may have to be taught before an independent toileting program can begin (Kissel, Whitman, & Reid, 1983).

A vital component of the assessment process for toileting is to establish whether a learner has a fairly stable pattern of elimination. Again there is conflicting information as to the best length of time to monitor elimination patterns. Generally, the longer the baseline the more information concerning a stable schedule will be established.

There are two techniques that can be used to monitor and establish the learner's elimination schedule (present level of performance). The first involves the use of electronic signal devices. These moisture-detecting devices sound a tone when urine or feces moisten the sensors, allowing the teachers or staff to record the incident (Azrin, Bugle, & O'Brien, 1971; Van Wagenen & Murdock, 1966).

Financial or other considerations may not warrant the use of signal devices. Consequently, another method involves checking the learner's clothing at specified intervals, recording whether or not an elimination has occurred. The intervals for observation vary somewhat across students, but time spans of up to 30 minutes

are generally acceptable. Some students who have inconsistent elimination schedules may require more frequent checks. Student health records should also be checked to ascertain whether there are relevant physical problems affecting elimination.

A systematic recording of the student's elimination pattern is the next step. A recording form will be needed for this task. Figure 10.4 provides one example of the type of form that can be used. A 15-day baseline was established which assisted the teacher in determining Jeff's pattern of elimination. Generally, the pattern indicates that Jeff gets off the school bus wet each day, possibly because of a large intake of liquids for breakfast and a long bus ride. Other fairly stable periods of elimination are about 10:30 a.m. after morning snack, between 12:30 and 1:00 p.m. after lunch, and mid-afternoon. With these times in hand, the teacher can schedule training sessions to coincide with Jeff's elimination patterns.

Once a stable pattern of elimination has been established, the teacher should consider developing a task analysis of the toileting process to which the student's present level of performance can be compared (Table 10.5). When assessing the learner's present level of performance, a preferred method is to use minimal assistance for any given step on the task sequence. This way, the teacher can get the most information concerning what skills the student can independently perform.

Suggestions for Instruction

1. If a student does not have a stable pattern of elimination, diuretics (e.g., coffee, tea, colas) can be used to induce urination at times when the student would not eliminate naturally (Foxx & Azrin, 1973b).
2. During either the baseline or instructional phase, when a student has had an accident, the student should be changed or assisted in changing *with a minimum* of verbal interaction between the student and the caregiver.
3. Brown and colleagues' (1979) principle of partial participation is as important in the toileting process as it is in all other ILS areas since it allows the learner some dignity. If necessary, the task sequence can be modified to accommodate the learner who will only be able to accomplish one or two steps independently.
4. The teacher should make a decision (based on student needs, physical disabilities, progress in dressing skills, age, and extent of parents' or significant others' participation) whether to use a forward chaining approach (Mahoney, Van Wagenen, & Meyerson, 1971) or a backward chaining approach (Azrin & Foxx, 1971). Usually, teachers will have a dressing skills program running concurrently with a toileting program, in which case a backward chaining approach might provide a more efficient and possibly more rapid method. (See Chapter Six for a detailed discussion of these techniques.) Using the backward chaining approach, the teacher assists the student with the beginning steps of the task sequence and starts training with the skills directly related to the toileting process (e.g., sitting on the toilet).
5. A number of validated behavioral procedures are available for use when inappropriate eliminations occur (Anderson, 1982). For example, Foxx and Azrin (1973b) have suggested the use of procedures such as manual and graduated guidance, fading, positive practice overcorrection, and mild reprimands (see Chapters Five and Six for discussions of these techniques).

Student's Name: JEFF Data Recorders: MRS. BARNES, KATHY

JIM

Code: W = Wet
 D = Dry
 (W) = Wet Bowel

Baseline Dates Daily Times	9/12	9/13	9/14	9/15	9/16	9/19	9/20	9/21	9/22	9/23	9/26	9/27	9/28	9/29	9/30
9:00 A.M.	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
9:30	D	D	W	D	D	D	D	W	D	D	D	D	D	D	W
10:00	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
10:30	W	W	W	D	W	D	D	W	D	D	W	D	W	D	D
11:00	D	D	D	D	D	W	D	D	D	W	W	D	D	D	D
11:30	D	D	D	D	D	D	D	D	D	D	D	D	D	W	D
12:00 P.M.	D	D	D	D	D	(W)	D	D	D	D	W	D	D	D	D
12:30	W	(W)	D	(W)	W	W	(W)	W	D	W	(W)	(W)	W	D	D
1:00	(W)	D	(W)	D	D	(W)	D	D	(W)	D	D	D	D	(W)	(W)
1:30	D	D	D	D	D	D	D	D	D	D	D	W	D	D	D
2:00	D	W	D	W	D	D	D	D	D	D	D	D	W	W	W
2:30	W	W	D	D	W	D	D	W	W	D	W	W	D	D	W
3:00	D	D	D	D	W	D	D	D	D	W	D	D	W	W	D
3:30	D	W	D	W	D	W	W	(W)	D	D	D	D	D	D	D
TOTALS	4W / 1(W)	5W / 1	3 / 1	3 / 1	5 / 0	4 / 2	2 / 1	5 / 1	2 / 1	4 / 0	5 / 1	3 / 1	5 / 0	4 / 1	4 / 1

■ FIGURE 10.4
 Sample Recording Sheet for Pre-Toilet-Training Baseline

- *Manual guidance.* Taking the learner's hands firmly in his or her hands, the teacher guides the student through the process of unfastening buttons and zippers and pulling down pants.
- *Graduated guidance.* This is a type of fading procedure that gradually removes the teacher's hands from the situation. One example that highlights this procedure is that when the student does not sit on the toilet when requested, the teacher provides the minimum force necessary to assist the student. Over time, the teacher's touch or hold is completely faded as the student learns to sit on request.

TABLE 10.5 Examples of Community Resources Identified from CNA Analysis

Skill Area	Person/Sites/Materials	Skills
Consumer education	Salespersons	Practice with high-pressure sales techniques
	Store managers	Permission to develop training sites
	Church groups	
	Service organizations	Volunteers to be used as trainers
	Large supermarkets	
	Small neighborhood stores	

- *Positive practice overcorrection.* This is a mild form of punishment requiring the student, after an accident has occurred and clothes have been changed, to approach the toilet from the point where the accident occurred. Then the student is required to lower clothing and sit on the toilet for a short period of time as a positive form of practice. Another overcorrection technique developed by Foxx and his colleagues is called *restitutional overcorrection*. This mild form of punishment requires students to clean up their own accidents, change themselves, and wash their own clothing (all with the help of the teacher if necessary).
6. *Prompts* in conjunction with verbal instructions (pointing to the toilet when saying "Jeff, sit on the toilet") can be a useful instructional procedure. Also, *modeling* may be appropriate in some situations where the teacher can model a specific step for the student or have another student model the tasks.
 7. Hitting, yelling, and lecturing students about their bad behaviors are inappropriate teaching procedures. In the case of toilet training they can be especially detrimental for a number of reasons, including increasing the stressfulness of the situation. Teachers should strive to remain calm and talk to the students in a neutral tone of voice (Foxx & Azrin, 1973b). The students' appropriate responses can be reinforced with social reinforcers and tangibles if necessary.
 8. Lancioni and Ceccarani (1981) developed an interesting procedure using part of the day (30 to 45 minutes) to teach toileting skills. All accidents were associated with 90-second exercise sessions as punishers. When exercising, the students were reminded to touch their wet clothes so the association could be made. To assist students in remembering to use the toilets, toilet insert seats with urine-sensitive devices were placed around the classroom. The students were required to pick up a seat before going into the bathroom (a step that became an additional reminder).

Techniques for Teaching Dressing and Grooming Skills

The state of the art of teaching basic dressing and grooming skills is fairly sophisticated. For example, Project MORE (Ferneti, Lent, & Stevens, 1974), originally

developed at the University of Kansas, provides task analyses for a large number of these skills along with recording sheets for monitoring student progress. For the program to be effective, teachers must apply it in a systematic manner.

A teacher may choose to develop the task sequences based on the setting, materials available, and the individual needs of certain students. As with all task analyses, the skill sequence is developed best by watching someone perform the target skill. Tables 10.6 and 10.7 are examples of grooming task analyses.

Suggestions for Instruction

1. During the acquisition stages, an increase in the number of instructional sessions may be helpful. For example, instead of having a learner brush his teeth once after lunch, the teacher can increase the number to five or ten shorter sessions spread throughout the day.
2. A first consideration of instruction is to decide which is more appropriate, forward or backward chaining. Different learners react to each approach with varying degrees of success; however, backward chaining appears to be most successful in the beginning stages. By beginning with the last step first, students are often immediately reinforced because the task is quickly completed (e.g., learning to snap the final button on a pair of pants: when completed, the student is finished dressing).
3. Bigge (1982) has suggested that a beginning program should teach undressing skills before teaching dressing skills because the undressing skills are easier.
4. Whenever possible, parents should be included in the program design process in order to obtain some level of continuity between procedures and materials used at home and at school.
5. Teachers should use only the level of antecedent behavior necessary to move the learner toward the desired task. For instance, graduated guidance may suffice instead of totally guiding the learner through the task. A physical prompt (pointing) may work instead of using a model. All the teaching strategies described in the toileting section are also appropriate for teaching dressing and grooming skills.
6. After a skill has been learned, the teacher should probe frequently to monitor whether or not the behaviors are being maintained.
7. Teachers can program for generalization by allowing students to practice dressing and grooming skills in different locations and with a variety of materials (e.g., school locker rooms, bathrooms, different makes of electric shavers).
8. It is important to model behaviors from an appropriate angle. When possible, peer models can be used to facilitate skill learning.
9. Because fashions and preferred color combinations change frequently and may differ across geographic locations, it is important to validate these norms frequently (Nutter & Reid, 1978). Nutter and Reid found it was possible to teach appropriate clothing color combinations by using simulation activities and actual clothing.

TABLE 10.6 Sample ILS Section of an IEP

Present Level of Performance	Annual Goal Statements	Short-Term Objectives	Evaluation Procedures
Strengths	<ol style="list-style-type: none"> 1. The student will be able to make a complaint to a store manager appropriately 2. The student will be able to plan and cook nutritionally balanced meals. 3. The student will be able to mend clothing and sew on buttons. 	<ol style="list-style-type: none"> 1.1 Outcome: Student will say and demonstrate the five steps for being assertive in a consumer situation. Context: Role playing and three community stores—complaints ranging from poor service to clothes exchange. Criterion: 100% demonstration of all steps. 2.1 Outcome: Student will plan on paper meals (breakfast, lunch, supper) for five consecutive days. Also, student will purchase the necessary groceries and correctly cook each meal. Context: Requisite materials, home living center. Criterion: Adequate completion of all steps on checklist. 	<p>Generalization of skills monitored in home and home management house. Bar graphs representing the application of each step of assertiveness.</p> <p>Meal planning and preparation for one week—checklist.</p>
Weaknesses	<ol style="list-style-type: none"> 1. Does not demonstrate assertiveness in consumer situations. 2. Is unable to plan and cook nutritious meals. 3. Cannot mend torn clothing or sew on buttons. 	<ol style="list-style-type: none"> 3.1 Outcome: Student will mend tears in pants seams and knees and in shirt seams and elbows. Also, student will sew on five different size buttons. Context: Home economics lab, assorted shirts and pants, thread, needles, scissors. Criterion: Satisfaction of home economist. 	<p>Task analysis for each sewing and mending task.</p>

TABLE 10.7 *Sample Task Analysis of a Short-Term Objective*

SKILL: SHAVING
Outcome: Student will independently shave himself.**Context:** Electric razor, in four different settings.**Criterion:** Smooth to touch of teacher.

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Gets razor out of storage area. 2. Takes razor out of box. 3. Removes plastic cover. 4. Takes plug out of box. 5. Plugs cord into razor. 6. Plugs razor into socket. 7. Turns on razor. 8. In an ear-to-chin motion:
shaves left side of face. 9. Shaves right side of face. 10. In an upward motion: shaves
under chin. 11. Shaves below lower lip. 12. Turns off razor. 13. Feels face for any unshaven areas. | <ol style="list-style-type: none"> 14. Reshaves if necessary. 15. Unplugs cord from socket. 16. Unplugs razor from cord. 17. Presses button with right hand.
Removes top with left hand. 18. Takes brush out of box. 19. Cleans razor head. 20. Returns brush to box. 21. Replaces top. 22. Replaces plastic cover. 23. Puts razor in box. 24. Winds cord around hand. 25. Puts cord in box. 26. Stores razor. |
|---|---|
-

(Prepared by Tina Couch)



IDEA FILE



- Oversize clothing assists students in learning the skills of dressing without the constriction of tight clothing.
 - Color coding is a valuable technique for teaching mildly and moderately retarded individuals to choose coordinated wardrobes. Clothes can be hung in the closet next to tabs of certain colors corresponding to colors marked on the label of the article. For example, pants and shirts that coordinate well in color, style, or design can have a blue mark on the label. The same color blue can be placed on a tab hanging on the closet rack. All pants and shirts with the blue mark are hung next to the corresponding tab for easy retrieval. Over time, the color codes can be faded.
 - Oversized buttons and buttonholes allow students with poor motor control to learn to button some items.
 - Tabs on zippers allow students to grasp zippers more easily.
 - Velcro can be used for students whose accompanying physical disabilities are severe enough to impede independent dressing skills.
 - Long-handled brushes allow learners with poor range of motion to brush their hair (Bigge, 1982).
-

Techniques for Teaching Home Management Skills

Home management as a curricular area has generally received some attention (evidenced by the number of living centers included in TMR classrooms), but has failed to become a daily program option for retarded learners. In recent years, recognition of home management skills as a crucial component for independent living has begun to surface (Dyer, Schwartz, & Luce, 1984). Hence, an increasing number of field-tested programs are becoming available to assist teachers in designing effective instructional programs in this area.

Some programs designed to teach home management skills address a problem faced by many retarded students, namely their difficulty in developing functional reading skills. These programs capitalize on the use of pictures to supplement difficult cooking directions and complex recipes (Spellman, DeBriere, Jarboe, Campbell, & Harris, 1978; Staples, 1975). In addition to teaching meal planning and preparation by using pictures, researchers have successfully instructed retarded learners to schedule and maintain an orderly system of housekeeping tasks. For example, Bauman & Iwata (1977) used a self-recording procedure that allowed two retarded males to monitor their own progress in completing housekeeping chores. Over a period of time, the completion of the target tasks was completely transferred to the natural reinforcers such as posting their progress on charts when tasks were completed.



Home management skills are an important part of Independent Living Skills—an example of partial participation. (Courtesy of DLM Teaching Resources, Allen, Texas)

Suggestions for Instruction

1. Small group instruction has been found to be more efficient and in many cases at least as effective as one-to-one teaching (Brown, Holvoet, Guess, & Mulligan, 1980). There are no set rules governing group size; however, three to four students may be appropriate depending on the size of the teaching area and safety procedures of the activity. Smith and Meyers (1979) discovered that instruction in telephone skills was more efficient and effective when groups of retarded learners were allowed to practice the skills among themselves.
2. Living centers built into the school classroom or in a nearby location in the school are the least desirable training sites and should be limited to teaching during the acquisition stage. The most desirable alternative would be to locate homes and apartments within the community where training can occur.
3. All instructional techniques discussed earlier in the toileting section apply to teaching home management skills (e.g., modeling, graduated guidance, physical prompts). For example, Johnson and Cuvo (1981) found that verbal instructions paired with visual cues, modeling, and physical guidance were effective methods for teaching food preparation.
4. The instant camera can be an invaluable teaching tool. Students who have trouble reading written directions can follow the sequence of a task by looking at pictures taken by the teacher (e.g., teacher photographs the steps to baking a cake). When such pictures are used as cues for teaching directions or maintaining a schedule, teachers can increase the difficulty of the pictures over time (Snell, 1981; Staples, 1975). For example, a series of steps in cleaning a shower stall or bathtub may, during initial teaching stages, require 10 sequential pictures. Over time, a teacher can gradually reduce the number of pictures by combining steps. The purpose of this approach is to fade the unnecessary cues.
5. Teachers should not assume that moderately and severely retarded learners are unable to increase their sight vocabulary beyond a few basic safety words. In many instances, a word or a short series of words can be paired with picture directions, with the pictures ultimately being faded.
6. Additional color and numeral cues can be helpful. For example, when housekeeping skills are taught using picture directions, the directions may include a numeral in conjunction with the picture. The learner can match the numeral in the picture to the same numeral located in the area of the house or apartment where the task is to be completed. The same technique can be used with color cues, for instance, color coding cooking materials (Spellman, et al., 1978).
7. It is necessary to keep precise data on skill acquisition and maintenance. The most useful method for this monitoring appears to be a task analysis sheet, which allows the teacher to record what antecedents were used (guidance, modeling, etc.) to assist the learner in completing each step (Cuvo, Leaf, & Borakove, 1978).
8. The data from these skill sequence sheets can be charted in a number of ways. However, the method that seems to be the most expedient for teachers is to chart the percentage of steps on the task analysis that students successfully complete (Figure 10.1).
9. Another charting method that may yield helpful data involves using the percentage for each level of assistance given by the teacher during one instructional

session. This format allows a visual picture of the entire instructional system. If the interventions are successful, the amount of guidance used would decrease while the percentage of steps completed under verbal directions or no assistance increases. If the behavioral monitoring demonstrates that little or no improvement in student performance has occurred, a change in the instructional system is required (Figure 10.2).

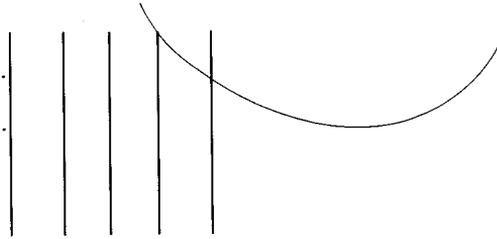
10. Cuvo, Jacobi, and Sipko (1981) used a system of minor prompts to teach retarded students clothes sorting, washing, and drying skills. For example, the teacher may say to the student, "What's the next step?" in order to prompt the student to complete the next task.
11. Incorporating visual cues into the instructional material can be an effective aid for teaching home management. Cronin and Cuvo (1979), for instance, used marks on fabric to teach students to stitch along a line. Marks on fabric can also show students where to begin and where to end the task. Over time, these material cues are faded as they become unnecessary.
12. Self-charting (allowing students to record their own progress) can be a powerful reinforcer in its own right. Whenever possible, the student should be allowed to record, for example, the number of task sequence steps accomplished without the

TABLE 10.8 Samples of Eating Task Sequences

SKILL: CHEWING SOLID FOODS

Task Sequence

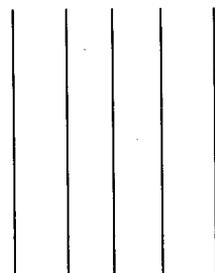
1. Chew once soft food with prompt.
2. Chew once soft food with no prompt.
3. Chew twice soft food with prompt.
4. Chew twice soft food with no prompt.
5. Chew medium food with prompt.
6. Chew medium food with no prompt.
7. Chew solid food with prompt.
8. Chew solid food with no prompt.



SKILL: RESTAURANT (FAST FOOD)

Task Sequence

1. Choose food items from menu.
2. Pay cashier appropriate amount.
3. Check change.
4. Pick up order.
5. Choose seat.
6. Eat appropriately without bothering others.
7. Place waste in garbage.
8. Use restrooms if needed.



✓ = Complete
 - = Incomplete

TABLE 10.9 Sample Task Sequence for Toileting

SKILL: APPROPRIATE TOILETING SKILLS

*Task Sequence**

- | | |
|--|----------------------------------|
| 1. Put lid up. | 9. Fold or bunch paper. |
| 2. Place seat down. | 10. Wipe properly. |
| 3. Undo belt, snaps, zipper. | 11. Use more paper if necessary. |
| 4. Pull pants down to knees or ankles. | 12. Stand. |
| 5. Back to toilet and sit. | 13. Pull up pants. |
| 6. Eliminate. | 14. Fasten snaps, zipper, belt. |
| 7. Locate toilet paper. | 15. Flush toilet. |
| 8. Tear off desired length. | 16. Place lid down. |

*Modifications can be made for different types of clothing, toilets without lids, and toilets where lid and seat have been left in the upright position.

aid of teacher prompts. Visual improvement on a graph may become a motivator for the student.

13. Group training (five learners) has been found to be successful in teaching telephone skills (Smith & Meyers, 1979). The key to success appears to be the teacher's use of material cues and coping devices such as a card with a person's picture, name, and color-coded phone number (Leff, 1974; 1975).
14. Matson (1980) found some interesting information when teaching home accident prevention to retarded learners. After verbal rehearsal, the students could not adequately role play the safety steps. This finding strongly implies that the use of class discussion does not guarantee that students will respond in an emergency. Accident prevention and home safety should be taught by doing, in the most realistic setting available. In some instances parents can be encouraged and trained to carry out these aspects of the curriculum. If not, teachers can teach the skills in community homes or home management houses that have been volunteered.



IDEA FILE



- The program options mentioned so far can be accomplished by developing a volunteer training program in the community. A close working relationship with community service organizations, church groups, and local school groups can help by identifying potential training sites and volunteers to help teach the skills and validate the program.
- Teachers can work with local organizations to develop a volunteer group made up of retarded learners who, under supervision, can enter the homes of the elderly and infirm to assist in housekeeping and cooking tasks. The school supervisor (parent volunteer, aide, teacher) can use these opportunities to program for generalization (new settings, equipment, time schedule, etc.), allow for guided practice, or teach new skills and adaptations of old ones (see Chapter Thirteen).

- Over the next 5 to 10 years, school systems may find it valuable to purchase a home that can be used in ways similar to the Home Economist College programs for home management houses (e.g., State University College at Oneonta, New York; the University of Georgia). Retarded learners can culminate their training (or in many cases acquire skills throughout their program) by living for periods of time in the house with other students, learning and/or enhancing their skills in a real life setting.

Materials. Many materials are available to assist in teaching home management skills. In most instances, however, the key to finding good materials will be in the teacher's ability to adapt existing equipment. The following are samples of some commercially produced materials that teachers may find useful.

Cookbooks. There are some cookbooks available that are written on lower reading levels and may be more appropriate for mildly retarded students. A home economist or county extension agent may be helpful in locating them.

Recipe picture cards. Teachers can make cards with pictures that correspond to the steps of a recipe. Examples of this approach can be found in studies by Robinson-Wilson (1977) and Johnson and Cuvo (1981).

Adaptive telephone devices. These are material cues to assist in learning to use the telephone effectively. (See *How to Use a Telephone*, Instructo Company, Paoli, Pennsylvania.) Risley and Cuvo (1980) used pictures of emergency persons (such as firemen) plus the appropriate phone numbers to teach students how to make emergency calls.

Techniques for Teaching Community Mobility Skills

An area of great importance that directly relates to a person's independence is community mobility. The abilities to obtain and hold a job, participate in leisure activities, and attend to daily needs all depend on a person's being mobile. Unfortunately, the curricular area of community mobility has only recently become a high priority, and it is often confined to retarded adults. The need still exists for an increased emphasis on teaching such skills beginning at the elementary level and continuing throughout the secondary program.

In general, there are three major areas of instruction under the category of community mobility: private transportation (bicycle safety, car pooling, and automobile driver training); mass transit; and pedestrian safety. Private transportation has been the category most neglected by researchers working with retarded learners. This fact, however, should not deter teachers from developing appropriate training programs in these skills. For example, with today's gasoline and automobile prices, increased numbers of people are reverting to transportation by bicycle. At the same time, however, communities are beginning to realize that their road and sidewalk systems are not designed to incorporate this additional traffic. The need to instruct students in safe bicycling skills is imperative.

A similar problem exists in teaching mildly retarded learners how to drive automobiles safely. This curricular area has received attention from some driver

educators who have developed successful training programs. However, the main concern in this area appears to be the inability of retarded students to read drivers' manuals, road signs, insurance forms, and other materials related to driving a car. Teachers can build into their programs behavioral objectives that address these skills.

The ability to use public transportation successfully will require a complex training program. A number of training programs have been conducted that can be used as examples. One of the first programs developed by Cortazzo and Sansone (1969) trained mildly and moderately retarded learners to travel on trains, buses, and subways. The interesting component of this program was the comprehensiveness of its approach. It included pedestrian skills, money usage, traveler responsibilities, schedule reading, and safety. The authors developed a system of color coded cards that could be used by the travelers to seek assistance should they become lost or confused.

A number of more recent studies have demonstrated the use of a behavioral approach to training community mobility skills (Certo, Schwartz, & Brown, 1975; Neef, Iwata, & Page, 1978; Sowers, Rusch, & Hudson, 1979). The most interesting and practical approach for teachers involves the technique used in the Neef, Iwata, and Page (1978) study. In this study, the mildly and moderately retarded learners were taught various bus-riding skills in the classroom, later generalizing them to community settings. The important point to note is that the authors did not rely solely on the lecture method of classroom instruction as many teachers do. Rather, they used a simulated bus and photographic slides that allowed the learners to view and discriminate between correct and incorrect bus-riding behaviors.

Training in safe pedestrian skills has been noted more frequently in the literature since Yeaton and Bailey (1978) demonstrated a series of procedures to teach regular education primary school students to cross the street safely. In this study, the authors solved several problems inherent in developing programs of this nature for real-life application. For example, criteria were established for determining how far a car had to be away from the intersection before crossing was permitted. These criteria allowed observers to more concisely record the safe versus unsafe behaviors of the students.

Page, Iwata, and Neff (1976) demonstrated the use of an in-class simulated street intersection to teach safe crossing skills that later were generalized to the community. The interesting point brought out by this investigation was that, overall, there was not a significant amount of time saved by first training in the classroom. Further, when they probed for generalization after each skill was taught, the authors discovered that a number of the behaviors required additional training. However, the safety factor involved in the beginning stages of training was a sufficient reason for beginning training in the classroom. The successful results achieved by Page, et al. in teaching these beginning skills could possibly be attributed to their use of visual slides that eliminated the need for the student to conceptualize a situation described by the teacher. An additional study by Vogelsberg and Rusch (1979) demonstrated how systematic fading of behavioral procedures can be used to teach severely retarded individuals to cross partially controlled intersections.

TABLE 10.10 *Sample Grooming Skill Sequence***SKILL: HAIR WASHING AND BLOW DRYING***Task Sequence*

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Get shampoo, towel, dryer, and comb. 2. Kneel at tub or stand before sink. 3. Unscrew cap from shampoo bottle. 4. Pour cap full of shampoo. 5. Set shampoo and cap on side of tub (or sink). 6. Turn on hot and cold water. 7. Adjust faucet to desired (warm) temperature. 8. Wet hair. 9. Pick up capful of shampoo. 10. Apply to hair. 11. Scrub with fingers (lather). 12. Rinse hair. 13. Squeeze water out of hair with fingers. 14. Turn off water. | <ol style="list-style-type: none"> 15. Get towel. 16. Dry hair with towel. 17. Put cap on shampoo. 18. Comb hair. 19. Get dryer. 20. Plug cord into socket. 21. Turn on dryer. 22. Dry top and front. 23. Dry back. 24. Dry left side. 25. Dry right side. 26. Turn off dryer. 27. Unplug dryer. 28. Rewind cord. 29. Put up towel, shampoo, dryer, and comb. |
|--|--|

(Prepared by Tina Kinsley)

TABLE 10.11 *Sample Grooming Skill Sequence***SKILL: CLIPPING NAILS***Task Sequence*

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Wash hands with soap and warm water. 2. Dry hands. 3. Get nail clippers. 4. Turn handle of nail clippers. 5. Place left thumb nail between blades. 6. Press handle. 7. Place left fore finger nail between blades. 8. Press handle. 9. Place left long finger nail between blades. 10. Press handle. 11. Place ring finger nail between blades. 12. Press handle. 13. Place pinky nail between blades. 14. Press handle. | <p>Repeat steps 5 and 6 for</p> <ol style="list-style-type: none"> 15. Right thumb. 16. Right fore finger. 17. Right long finger. 18. Right ring finger. 19. Right pinky. 20. Put up clippers. 21. Wash hands with soap and warm water. 22. Dry hands. |
|--|--|

(Prepared by Tina Kinsley)

TABLE 10.12 Sample Grooming Skill Sequence

SKILL: WASHING EARS

Task Sequence

1. Gather towel, washcloth, and soap.
2. Turn on hot and cold water.
3. Adjust faucet to desired (warm) temperature.
4. Wet washcloth
5. Put soap on cloth.
6. Squeeze out excess water.
7. Bring cloth to right upper ear.
8. Clean upper ear (ridge).
9. Clean middle ear.
10. Clean behind ear.
11. Bring cloth to left upper ear.
12. Clean upper ear (ridge).
13. Clean middle ear.
14. Clean behind ear.
15. Rinse washcloth.
16. Wipe right ear (upper, middle, behind).
17. Wipe left ear (upper, middle, behind).
18. Dry right ear with towel.
19. Dry left ear with towel.
20. Put cloth and towel in dirty clothes basket.

(Prepared by Tina Kinsley)

TABLE 10.13 Sample Task Sequences for Home Management Skills

SKILL: CUTTING FOODS ✓

Task Sequence

1. Take cutting board.
2. Take knife.
3. Take food item.
4. Hold item between thumb and forefinger horizontal.
5. Hold knife handle.
6. Hold knife, edge down.
7. Place knife on right edge of item.
8. Cut in vertical direction.
9. Repeat until 1/4" from finger.
10. Cut pieces again if necessary.
11. Take container.
12. Place pieces in container.

SKILL: OPENING CANS

Task Sequence

1. Take can.
2. Take can opener.
3. Hold opener with blade on top with right hand.
4. Pull apart handle with left hand.
5. Place blade above rim of can.
6. Hold handle with left hand.
7. Squeeze opener until lid "pops."
8. Turn with right hand.
9. Turn in circular direction once.
10. Remove lid: Do not touch edge of can
11. Throw lid in trash can

(Prepared by Tina Kinsley)

TABLE 10.14 *Sample Task Sequences for Home Management Skills*

SKILL: WASHING CLOTHES and DRYING CLOTHES ✓

*Task Sequences**Washing*

1. Open lid.
2. Remove lint tray.
3. Clean lint tray.
4. Return lint tray.
5. Gather clothes.
6. Place clothes in washer.
7. Fill 1 cup with detergent
8. Pour detergent on clothes.
9. Close lid.
10. Set load size selector.
11. Set temperature selector.
12. Pull out on/off button.
13. Turn right to correct setting.
14. Push in button.

Drying

1. Remove lint tray.
2. Clean lint tray.
3. Return lint tray.
4. Open dryer door.
5. Open washer lid.
6. Remove clothes from washer.
7. Place clothes in dryer.
8. Close dryer door.
9. Set temperature selector.
10. Set time cycle.
11. Press start button.
12. Remove clothes.
13. Fold clothes.

(Prepared by Tina Kinsley)

TABLE 10.15 *Sample Task Sequence for Home Management Skills*

SKILL: CLEANING BATHTUB ✓

Task Sequence

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Get out cleanser, towel, and sponge. 2. Sprinkle cleanser on bottom of tub. 3. Turn on warm water. 4. Wet sponge. 5. Scrub bottom of tub. 6. Scrub sides of tub. 7. Scrub top rim of tub. 8. Wipe faucets. | <ol style="list-style-type: none"> 9. Rinse sponge. 10. Rinse faucets. 11. Rerinse sponge. 12. Wipe top rim. 13. Rinse bottom of tub. 14. Rinse sides of tub. 15. Turn off water. 16. Wipe faucets and rim with towel. |
|--|--|

(Prepared by Tina Kinsley)

TABLE 10.16 *Sample of Bus-Riding Task Sequence*

SKILL AREA: RIDING A PUBLIC BUS

Task Sequence

1. Walks to correct corner and bus stop.
2. Stands at proper location at bus stop and exhibits appropriate social skills.
3. Identifies bus by reading location or asks driver if the bus goes to the desired location.
4. Boards bus and deposits correct change (two quarters, or five dimes).
5. Asks for transfer if desired.
6. Pays for transfer if requested.
7. Finds seat and exhibits appropriate social behavior.
8. Identifies landmarks along route.
9. Gets off at appropriate stop or requests leave by ringing buzzer.
10. Departs bus within 15 to 20 seconds after bus stops.
11. Continues to desired destination.

If transfer is required:

12. Walks to correct corner and bus stop.
13. Stands at proper location at bus stop and exhibits appropriate social skills.
14. Identifies bus by reading location or asks driver if this bus goes to the desired location.
15. Boards bus and hands driver the transfer slip or token.
16. Finds seat and exhibits appropriate social behavior.
17. Identifies landmarks along route.
18. Gets off at appropriate stop or requests leave by ringing buzzer.
19. Departs bus within 15 to 20 seconds after bus stops.
20. Continues to desired destination.

Program for the following uncontrollable variables:

1. Bus never arrives.
 2. Bus is late.
 3. Driver is rude.
 4. Other passengers are rude.
 5. No seats are available.
-

TABLE 10.17 *Sample of Pedestrian Safety Task Sequence***SKILL AREA: PEDESTRIAN SAFETY***Task Sequence**

1. Finds crosswalk or corner where crossing is safest.
2. Waits at curb and watches signal.
3. When signal to go occurs, looks all directions to check compliance of traffic.
4. Cross street while monitoring the status of traffic in all directions.

*This sequence is repeated at both controlled and uncontrolled intersections under conditions of heavy traffic, medium traffic, and light traffic. At uncontrolled intersections an additional step should be added for teaching students to judge the speed and distance of cars and then generalize the skill to all other situations.

Safety is an important concern whenever community training occurs. Sowers, Rusch, and Hudson (1979) included the following safety procedures that might also be considered for use by teachers:

1. Students carry emergency information cards.
2. Police are apprised of the program.
3. Supervision is highly structured.
4. Parents are included in the program.
5. Observers unknown to students shadow their movements.

Suggestions for Instruction

1. Deciding which, if any prerequisite skills can be taught first in the classroom or on the school campus is an important first step. For example, training public bus-riding skills can be initiated in simulated situations by using school buses that are generally available (possibly on request). A bus driver or aide could be recruited to play the part of a public transit worker. In this situation, communication skills, scheduling, money computation, social skills, and the like can actually be prompted or modeled by the instructor, allowing the student to practice under guided conditions.
2. Yeaton and Bailey (1978) found that a sequence of tactics including verbal instruction on the task, modeling by the teacher, verbal rehearsal by the students (telling what they were going to do), and actual practice of the task by the students were successful procedures for teaching elementary school students to cross the street. The same or similar procedures have been found successful for retarded learners.
3. Verbal reminders, which are considered prompts, can be useful during training for getting students to move on to the next step of the task sequence (Spears, Rusch, York, & Lilly, 1981). These reminders should eventually be faded to allow the learner more independence.

4. Cards can be carried by the learner that correspond to bus destinations displayed on the front of the vehicle (Cortazzo & Sansone, 1969). At this point, the skill of matching is required as opposed to relying strictly on memory. Over time, the cards can be faded when and if they become obsolete.
5. The use of videotapes of actual environmental events can be an effective and efficient method for teaching community mobility skills (Certo, Schwartz, & Brown, 1975). Allowing learners to view, discuss, and compare correct with incorrect responses in any of the skills areas can be useful for later generalization. Teachers should keep in mind, however, that this approach will not work with all retarded learners. Coon, Vogelsburg, and Williams (1981) found that simulated training did not work with a severely retarded client. Mobility skills were only obtained when training occurred in the community.
6. For teaching pedestrian safety skills, volunteer drivers can be involved so that various levels of instruction can be introduced under near-actual street conditions. For instance, automobiles with volunteer drivers can be used to allow practice in crossing streets when drivers do not abide by the rules (e.g., failure to use a turn signal which, if used, would alert pedestrians not to cross even if they had the right of way).
7. Driver training for mildly retarded learners is a viable programming option. Special educators should work closely with driver training teachers to adapt the program to the students' needs. The psychomotor skills involved in driving can be handled by the driver education teacher. Academic skill deficits, in particular reading, will be the areas that special educators will address. Material cues (e.g., underlining key words), drill, and peer tutoring may help students to learn the rules and regulations for drivers.



IDEA FILE



- Peer tutoring can be an effective technique for developing community mobility skills. Regular class student volunteers can be trained to accompany the learner on trips into the community for the purpose of generalizing skills, providing the necessary models and prompts, while also recording data on the progress of the student.
- It can be useful to develop a public relations campaign that includes newspaper coverage of the community mobility training activities. A photographic slide package of the activities can be used when speaking to local organizations. Slides of a student's data chart can help the public, and specifically parents, to see the utility of monitoring student progress in this fashion.
- Scheduling community-based activities can be a major barrier to effective programming. Barriers such as lack of transportation to and from the training sites can also hinder the implementation of these program endeavors. Therefore, an important consideration is to designate one individual (teacher or aide) who is responsible for coordinating the activities. However, the teachers involved will have to convince the administration of the program's worth and should develop the overall plan, listing perceived barriers as well as potential solutions.

- If the situation is such that total community training is infeasible, a solution to the problem can be found in the technique used by Page, et al. (1976), who used frequent community probes after the initial training on street-crossing skills was completed in the classroom. That is, students may learn a set of skills (e.g., starting across the street within a period of time after the "walk" sign is activated) and meet criterion in the classroom setting. Subsequently, the trainers would bring the students to a community site in order to observe whether or not the skill had generalized and, if not, prompt for the skill. The important point is that if it is not feasible to carry out the entire training sequence in a community setting, frequent probes and review sessions can be initiated in the natural environment (Snell, 1981).
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Techniques for Teaching Consumer Skills

One area only minimally addressed in the literature involves teaching retarded learners the skills they need to be effective consumers. The current focus appears to be on teaching specific skills that can be applied to consumer needs (e.g., telephone skills, budgeting, coin equivalency). More programs should be made available, especially for mildly and moderately retarded learners, that teach advanced skills such as comparison shopping, warranty rights, and dealing with hard-sell tactics. Teachers should begin consumer skills early in the elementary program, to be continued throughout the secondary program.

One basic area of consumer programming involves the ability of retarded students to learn basic money handling skills. A series of studies by Cuvo and his associates trained retarded learners in such diverse skills as coin summation (Lowe & Cuvo, 1976), coin equivalency (Trace, Cuvo, & Criswell, 1977), and change computation (Cuvo, Veitch, Trace, and Konke, 1978). These studies emphasized a behavioral approach that combined the procedures of task analysis, modeling, prompting, and in some cases physical guidance. An interesting technique in the coin equivalency study was the use of a vending machine to return incorrect coin combinations. The natural reinforcer of obtaining the dispensed object when correct coin equivalencies were used was an added feature.

One of the more comprehensive programs for teaching complex skills such as budgeting, checkbook management, and bill paying to mildly retarded students was developed by Orr (1977). The foundation for the program was a fictitious paycheck received by each student with amounts based on the minimum wage. From their paychecks, students were taught to budget their take-home pay to meet daily needs. In addition, a token system for preferred classroom activities, including a built-in response cost for inappropriate behaviors, was included in the program. Over all, the author found the program to be successful with the target learners, who went on to develop a banking system for check cashing and a bookkeeping system to monitor expenditures. However, a program of this nature becomes truly functional to learners when the skills they learn in the classroom can be applied to independent living situations. Consequently, the next logical step for such a program would be to develop activities that allowed for guided practice in community settings and under realistic conditions.

Suggestions for Instruction

1. Teaching retarded learners proper dress and presentation so that they do not significantly stand out from other consumers is important (Cleland, 1978). This is especially important for mildly retarded learners in areas such as communication skills, color coordination of clothes, and grooming. One technique for accomplishing this outcome is to analyze the skills people use in consumer situations and the clothing they wear. For example, a person making a complaint to the telephone company may gain more consideration by dressing neatly and eliminating any aggressive language from the interview.
2. The calculator has gone beyond being a convenience for many people. Students with severe learning problems can be taught extensive use of the calculator for solving everyday living problems. Accordingly, teaching retarded learners the care and maintenance of the unit, as well as keeping one with them in situations where needed, will be important skills (Wheeler, Ford, Nietupski, Loomis, & Brown, 1980).
3. Community volunteers are vital to these programs. In particular, experts in sales techniques who can assist in training learners to resist unscrupulous sales tactics are a must (Cleland, 1978). For example, all mildly retarded and some moderately retarded students would benefit from instruction on how to discourage salespersons either by phone or in person.
4. Consumer education is for all retarded learners, regardless of severity levels. Severely retarded learners would benefit from instruction on how to ask cashiers if they have rung up the right price or given back the correct change. In addition, a moderately retarded learner might learn to comparison shop by telephone. One instructional strategy that works well with all retarded learners is to teach them to ask the cashier at least once during the checkout process, whether he or she has rung up the correct price for an item. Today's computerized cash registers make it difficult to monitor the computation of many items, and this technique will cue the cashier to be more careful to "punch in" the correct price.
5. Managers of retail businesses (such as grocery and drug stores) can be helpful in developing training sites in their stores. These sites can be used to maximum effectiveness if the students are instructed at times when business is slow, allowing cashiers and stock personnel to participate in training.
6. It is important to identify situations where consumers are most often cheated and simulate those events using community volunteers. For example, a cashier at a community training site can be instructed to purposely give the student the incorrect change. The teacher can then step in to model the appropriate behavior to exhibit under those circumstances.
7. A technique mentioned earlier in this section involves teaching money usage in real-life situations. Trace, et al. (1977) used vending machines to provide feedback and natural reinforcement to students learning coin equivalency. Vending machine skills must be taught on many machines before students will generalize the skills independently (Sprague & Horner, 1984). Langone (1981) suggested that more real-life activities can be programmed into the classroom, for example, having students pay for preferred activities out of money given to them at the beginning of each school day. Students' lack of success in using money may be related more to the realism of the activities provided than to an inability on the part of the learners.

8. A procedure that appears successful in teaching some consumer skills to retarded learners is called *verbal rehearsal*. Students can learn to say the steps of the skill sequence at least once before they attempt an independent trial. The instructional strategy is for the teacher to model the procedure by verbalizing each step and having the students repeat the verbalization before they begin the procedure.
9. Students who have poor long-term memories benefit from learning to write or type notes on cards before they attempt a task. For instance, students who have learned to be more assertive in consumer affairs situations (warranty rights), may still find it helpful to write down the points they wish to make before they talk to the store manager. (See Chapter Two for techniques of assertiveness training.)
10. Generalization will not just happen except in rare instances. If learners are taught to comparison shop in one grocery store, volunteers can assist them in practicing those skills in other stores that are representative of the businesses in a given community.



IDEA FILE



Contact the local cooperative extension agent in charge of home economics. This professional can be an excellent resource for program development. Funded through a cooperative effort by federal, state, and local governments, the extension service provides pamphlets and other resources that can be used by teachers for developing curricular activities. Students can be instructed in the services that the local extension agents can provide them, and they can be given practice in using those services.

Materials. Some of the most helpful materials for retarded students are those developed by teachers to help them in coping with daily life problems. One way to begin developing such materials is to look for methods of adapting the task to a particular student need. Identifying the adaptation often becomes apparent during the task analysis phase.

For example, a severely retarded student who cannot read basic sight vocabulary or compute the basic operations of arithmetic will require some type of adaptation to complete a shopping skill sequence. Nietupski, Certo, Pumpian, and Belmore (1976) came up with one possibility when they developed a portable shopping aid. This material assisted students by sequencing pictures in the order they were found so the student could match the picture to the actual item for selection. The portable aid had a number of adhesive strips (each representing \$.50) next to each item depending upon the cost of the item (e.g., soup = \$.50 or less, hot dogs = between \$.50 and \$1.00). The students were taught to remove the adhesive strips and place them on the designated spaces at the top of the aid. Ten spaces were allotted (equivalent of \$5.00) so the students would know when they reached their maximum expenditure.

Some professionals have mistakenly assumed that mildly retarded students automatically become effective consumers. Unfortunately, this has not been the

case. In a study to identify the shopping patterns of retarded individuals, Williams and Ewing (1981) found that mildly retarded adults demonstrate that they can shop independently; however, items are often chosen with little regard to nutritional value or cost comparison but are often chosen on impulse.

Materials for training mildly retarded students in consumer skills can take much the same form in terms of adaptation but may not need to be as precise as they are for more severely retarded students. Matson (1981) taught mildly retarded learners to stay within a predetermined budget by using a shopping aid that grouped items by cost so that they would know when they reached their spending limit. The examples presented here can be models for other materials that teachers can develop to help students to become better consumers.

Techniques for Teaching Sex Education

Sexual behavior of retarded citizens is still a topic that professionals would rather avoid. Therefore, in some programs the topic is either completely ignored or relegated to discussions concerning basic biological information. The most difficult consideration for teachers in developing a sex education program is not whether a program of this nature is important, but whether or not the individual teacher is capable of dealing with the subject matter (given his or her own feelings and beliefs). A perfectly acceptable stand for some teachers to take is that they do not feel they can teach this content area; however, they will find someone else who can be successful in developing and implementing a program.

Ingalls (1978) suggested that a comprehensive curricular option for providing sex education to retarded individuals includes the following topics: anatomy of both sexes; sexual techniques; contraception; venereal diseases; pregnancy; and homosexuality. In addition, Shulman (1980) suggested that sex education should be expanded to include methods of communication between individuals, caring for others, trusting, and respecting one another's privacy. There are comprehensive curricula existing that cover those areas, but teachers should not begin instruction without first laying the necessary groundwork.

Assessment of sex-related skills takes a different format from all other curricular areas. The need is not necessarily to identify the student's skill or knowledge, rather the goal of assessment may be to identify what information the student wishes to know. Accordingly, teachers may consider developing some type of questionnaire that students can respond to either in writing or orally.

Payne, Polloway, Smith, and Payne (1981) developed an interesting assessment device that included 24 questions ranging in topics from "What are wet dreams?" to "What are the safest forms of birth control?" and "Is it easy to be a good mother?" (p. 316).

Observation can be a useful tool for establishing the present level of performance for some areas related to sex education. For example, a student's ability to care for a baby can be observed in a structured setting such as a day care center. A student's ability to socialize appropriately with others can also be observed under structured conditions.

Suggestions for Instruction

1. Requesting that administrators appoint a committee of professionals, parents, and select community members with the charge of developing the foundations for programs in sex education is a first step. A committee of this nature should be led by someone who is competent in areas of sex education, for example, attitude awareness. This group leader can be a teacher, administrator, parent, or outside authority who has been trained to deal with these topics.
2. Examples of topics that the committee must deal with are attitudes toward sexual expression by the retarded, community attitudes, and marriage and parenthood for the retarded (Schulman, 1980).
3. Under the guidance of the committee, volunteer teachers and parents should be chosen who will receive additional training and will eventually teach the content to the learners.
4. As much information as is available concerning sex education for the retarded should be gathered.
5. The units of instruction to be included must be determined depending on learner need. Payne, et al. (1981) suggested six possible units, including awareness of self; understanding maturity and puberty; interpersonal relationships; sexual responsibilities and relationships; sex and marriage; and venereal disease.
6. Teachers should avoid judgmental statements that reflect their own values. Information should be presented in direct answers to questions, providing honest and realistic information.
7. Hamre-Nietupski and Williams (1977) demonstrated that they were able to teach some areas of sex education to severely handicapped students. Sexual body distinctions, premenstrual training, social interactions, growth distinctions, and reproduction were some of the areas addressed in the program. The important strategy of this study appeared to be the task analyses the authors devised. Once the tasks were broken down and the subskills identified, the students were able to master the objectives using role playing and verbal instructions (Richman, Reiss, Bauman, & Bailey, 1984).
8. Role playing and the use of puppets can be effective methods for teaching some aspects of sex education. For example, Schulman (1980) suggested using puppets to teach role identification and appropriate behavior. Students can write and produce their own puppet shows in relation to family scenes and dating. Similarly, role playing can be an effective method to continue to improve a student's ability to exhibit appropriate behaviors.



KEY CONCEPTS



- Teaching independent eating skills to retarded learners can range from instruction in swallowing skills to instruction in appropriate table manners.
- Effective teaching of toileting skills requires consistent application of behavioral techniques. A most important consideration involves determining whether or not the student is developmentally and physiologically ready to be trained.

- Home management skills range from cooking and cleaning to budgeting and parenting skills. The best settings for teaching these skills are community environments such as volunteer homes in neighborhoods surrounding the school.
- Community mobility skills include private transportation, mass transit, and pedestrian safety.
- Retarded learners need to be taught appropriate consumer skills.

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TEACHING COMMUNICATION SKILLS TO RETARDED LEARNERS

■ The ability of retarded learners to communicate with others is a prime determinant of their successful community integration. It would be a difficult task to identify daily activities where the use of some level of language and communication was not necessary. Therefore, some professionals believe that a person's ability to communicate should be gauged by the demands placed on that person in community activities.

At times, there is a tendency to define communication only as the use of oral language; thus students are placed on the basis of their ability to communicate orally. When this occurs, mildly and moderately retarded students are the most likely to take part in community activities. Learners who are severely or profoundly retarded are more likely to be excluded from the community because they lack the ability to communicate orally. This adds to their isolation from the general population and serves to further debilitate their language skills.

Speech, language, and communication skills must be an important program component for all retarded learners. Whether the response mode taught is speech, manual signing, communication boards, picture cards, or any combination of methods will be based on each learner's strengths and weaknesses. The emphasis on communication skills must be a major effort, interwoven throughout the entire curriculum (Kaczmarek, 1985). For many retarded learners, a half hour or an hour of "language class" will not provide the necessary skills for community integration. Similarly, designating oral language proficiency as a prerequisite for community placement may not be appropriate. Instead, the need for communication training may in itself be a good reason for increasing community-based instruction.

There is a great deal of literature already available on communication skills, and the list continues to grow. Therefore, the scope of this chapter will be limited

to two major areas. The first area emphasizes methods for teaching communication or the functional use of language for retarded learners who have acquired few if any skills. The second area is an overview of teaching and refining the oral language skills of mildly retarded learners. The large body of existing knowledge has generated a number of issues that professionals are currently debating, and the large number of commercial language programs available makes it difficult to choose an approach for teaching language and communication. With these issues in mind, the following section presents information that may help teachers to match the proper language methods to learner needs.

ISSUES IN LANGUAGE AND COMMUNICATION TRAINING

Language, Speech, and Communication

A first task is to clarify the difference among language, speech, and communication. Some professionals use the terms synonymously; however, there are differences in meaning as well as interrelationships among these areas.

Schiefelbusch and McCormick (1981) provided a succinct discussion of the three areas. First, they described language as the "abstract and complex" system which allows the individual to "understand and express intentions" (p. 109). Therefore, language includes both the ability to provide information about events, objects in the environment, and people and the ability to deal with abstract concepts at different levels (grammar and syntactic rules).

Once the different levels of language are mastered, an individual must develop a system for transmitting ideas, needs, and so forth. Speech is a response or output mode that relies on the individual's ability to vocally produce the sounds needed to express those ideas and needs. However, speech is not the only mode for expressing a message. Alternate modes for transmitting language are communication boards with graphic symbols, manual signing or gesturing, writing, or any combination of these.

Finally, communication involves social interactions whereby individuals share some type of information, but not necessarily by means of complex systems of language rules (Sailor, et al., 1980). Each area of language, speech, and communication has important implications for retarded learners depending on their specific needs. The last area, communication, has particular application to severely retarded learners who are prelinguistic. The question to be asked, then, is, Which area should the teacher emphasize: language, speech, communication, or any combination thereof? This question has fostered many debates among professionals in the field of language development.

Approaches to Language and Communication Training

There are a number of issues stimulating the thinking and subsequent practice of professionals developing programs for language deficient learners. The first issue



Communication involves social interactions whereby individuals share some type of information. (Courtesy of DLM Teaching Resources, Allen, Texas)

involves whether mentally retarded individuals learn language differently from their nonhandicapped peers or whether they learn language in the same manner but at a slower or delayed rate (Schiefelbusch & McCormick, 1981). Research findings tend to support the delayed language theory; however, there are some professionals who believe that the language of retarded people is different from that of the nonhandicapped population.

A second issue concerns the appropriateness of developmental language theory versus behavioral intervention models (Sailor, et al., 1980) as applied to retarded learners. Developmental theorists believe that severely retarded learners must be guided through a series of activities that correspond to normal language development, particularly the Piagetian stages of development. Therefore, training retarded learners in communication skills before they have mastered such cognitive prerequisites as functional object use and the ability to separate themselves from objects (Sailor, et al., 1980) decreases the probability that these students will demonstrate intentional language use (Reichle & Yoder, 1979).

Conversely, other researchers believe that there is a paucity of data-based evidence demonstrating that retarded learners exhibit deviant language structure when they are not taught the cognitive prerequisites (Guess, 1980; Guess, Sailor, & Baer, 1978). Instead, these researchers support the notion that functional commu-

nication can be taught to learners who have not mastered the cognitive prerequisites with no harm to their development of more complex language usage or generalization of language skills.

Both issues have important implications for teaching communication to retarded learners. Adhering to the deviant or different theory of language may influence a teacher to view retarded learners as being unable to obtain any normal language usage. This approach may serve to bias practitioners against emphasizing language development for the retarded, especially the more severely handicapped learners. Subscribing to the delayed theory, however, may influence teachers to increase their emphasis on communication skills, shifting the focus to increasing the quantity of language experiences for retarded learners and bridging the gap that the language delay has created.

The issue of developmental versus behavioral approaches may force some professionals into adhering to one approach over the other. Some teachers may believe that all students should master all cognitive prerequisites before being taught functional language skills, while others subscribe solely to an approach that ignores developmental milestones.

Excellent language and communication systems have been developed that are based on different theoretical viewpoints. The important question is not whether one theoretical approach to teaching communication is better than all the others, but whether one approach meets the needs of a given learner at a specific point in time. Training in prerequisites may be important for some learners, while teaching functional communication via manual signs may be important for others.

TEACHING COMMUNICATION SKILLS: THE IEP

Steps One and Two: Conducting the Community Needs Assessment (CNA)

Understanding how communication skills are used in daily living activities is important for teachers of mildly, moderately, and severely retarded learners. First, the communication skills students need to interact with others must be identified. Second, teachers should identify situations and areas in the community where learned communication skills can be practiced. Both types of information can be gathered by implementing a community needs assessment.

For example, teachers of mildly retarded learners may be interested in the topics their students discuss when engaged in leisure activities. Once identified, these topics can be incorporated into role-playing lessons designed to improve the quality of communication in social skills situations.

Similarly, teachers of severely retarded learners may wish to identify the types of communication skills needed by students in several nonpaid work training sites. Once identified, these skills can be incorporated into their daily instructional activities (Halle, 1982).

Step Three: Identifying Potential Annual Goals

There are many annual goals in communication skills that are potentially applicable to handicapped learners. These goals can range from complex interpersonal speaking skills taught to mildly retarded students to simple gestures for communicating needs taught to some severely retarded learners. Although assessment data are required to pinpoint the goals and objectives appropriate for individual students, teachers can develop a list of potential goals to help them organize their subsequent assessment strategies.

The following list of annual goals is a representative sample of those appropriate for retarded learners. The list is categorized into goals that may be most suitable for mildly, moderately, or severely retarded learners. Because retarded learners are a heterogeneous population, the goals are not restricted to one group. Teachers may find, for example, that goals listed under the mildly retarded category are applicable to moderately or in some cases severely retarded students.

Mildly and Moderately Retarded

1. Demonstrates understanding of common sounds.
2. Imitates simple sentences.
3. Discriminates between singular and plural nouns.
4. Says phrases that have correct noun/verb agreement.
5. Discriminates present tense verbs from other tenses.
6. Completes tasks when orally directed.
7. Answers oral questions with correctly spoken sentences.
8. Gives oral directions involving places and task completion.
9. Asks for directions or help.
10. Converses in social situations.
11. Converses in consumer situations.

Severely Retarded

1. Imitates questions of others.
2. Imitates mouth movements of others.
3. Imitates tongue movements of others.
4. Imitates sounds.
5. Follows simple directions.
6. Knows objects by their labels.
7. Uses gestures and signs to request assistance or convey needs.

8. Uses electronic communication boards and other signaling devices.
9. Uses communication signals in social situations.
10. Pronounces simple words.
11. Says simple sentences.

Step Four: Translating Goals into Potential Short-Term Objectives

Once teachers have identified the goals they wish to work with, their next step is to translate them into measurable objectives. The technique is the same as the one described in other chapters. To develop a measurable objective the teacher must include the outcome, context, and criterion.

Outcome: The student will rewrite sentences using the present verb tense.

Context: The student will be given five sentences that include either past or future verb tenses.

Criterion: 100% correct.

Outcome: The student will orally answer questions that commonly are asked in social situations.

Context: Questions asked by teachers, friends, and new acquaintances, such as, "How are you?", "What music do you like?", "Where do you go to school or work?"

Criteria: Student will maintain eye contact when answering, maintain appropriate social distance, and occasionally ask a return question.

Outcome: The student will produce the sounds "ma," "da," by imitating the teacher.

Context: Stimulus provided by the teacher.

Criterion: 5/5 trials.

Short-term objectives are most effective for retarded learners when written in a form that will allow the student to perform the skill in a natural setting. For example, the second objective listed here could include a sentence in the Context section explaining the need to ultimately test this skill in actual social situations. The objective essentially remains the same, with the only change occurring in the context.



KEY CONCEPTS



- A major criterion for the successful integration of retarded learners into the community is their ability to communicate.
- Communication is much broader than speaking. Communication is any technique retarded learners can be taught to use to convey their needs and feelings to others (e.g., gestures, manual signing, communication, and oral speech).
- A major goal for teaching mildly and moderately retarded learners is to refine their speech and language to improve the quality of their independence.

- A major goal for severely retarded learners is to teach them to communicate immediately by any means possible.
 - Some professionals subscribe to a developmental approach to language training, while others support a behavioral model. Both approaches have merit and are appropriate for different learners based on their needs. Generally, younger students as a group may be best suited for training in developmental prerequisites. Older or more severely retarded students may require a more functional method that immediately allows them to interact with their environment.
-

Step Five: Assessing Student Entry Behaviors

Assessment of the communication deficits of retarded learners should have the same basic goals as would assessment of any set of skills. Screening for learners with communication problems is a primary concern, since most mentally retarded learners require additional training in this area. Establishing the learner's present level of performance is an important second step. This step covers a broad area including identification of present and future communication needs.

An assessment system also monitors student progress, one means of judging program success or failure. Therefore, assessment of a student's communication skills should be ongoing so that judgments can be made as to when and if changes are needed. Ongoing assessment procedures serve to monitor a learner's communication skills in a variety of settings, not just in the classroom.

Methods of Assessment

Miller (1978) identified four categories of language assessment procedures: standardized tests, developmental scales, nonstandardized tests, and behavioral observation. Standardized language tests have been normed on large groups of children. As with all norm-referenced instruments, the information obtained can be useful when analyzed with caution. Teachers using standardized language tests do so properly when the results are used for survey-level analysis leading to additional assessment of specific areas.

There are a number of commercially produced language tests that are appropriate for obtaining survey-level assessment information on mildly retarded learners. Table 11.1 presents a partial list of these tests.

Developmental scales are based on normal language development observed over time by professionals. Various stages of development are identified by developmental milestones that generally occur at predictable points in a person's life. These scales provide the means to compare a retarded learner's development to normal development. Developmental scales are checklists that either can be administered to parents by asking them whether their children exhibit a given set of skills or can be given to students by structuring tasks for them and observing whether or not they can complete the tasks for their age level.

Like other standardized tests, developmental scales can be a valuable tool for

TABLE 11.1 Common Commercial Achievement and Diagnostic Tests of Language Skills

<i>Test</i>	<i>Dimension of Language Measured</i>	<i>Grade/Target Population</i>
Assessment of Children's Language Comprehension Consulting Psychologists Press Palo Alto, CA	Identifying pictures with multiple verbal elements	Preschool–Elementary
Clinical Evaluations Charles E. Merrill Publishers Columbus, OH	Phonology Morphology Syntax and Semantics	K–12
Goldman-Fristoe Test of Articulation American Guidance Service Circle Pines, MN	Articulation	Over 2 yrs. old
Goldman-Fristoe-Woodcock Test of Auditory Discrimination American Guidance Service Circle Pines, MN	Phonology	Over 4 yrs. old
Illinois Test of Psycholinguistic Abilities University of Illinois Press Urbana, IL	Vocabulary Expression	2–7 yrs old
Peabody Picture Vocabulary Test American Guidance Service Circle Pines, MN	Receptive vocabulary	2–Adult
Test of Adolescent Language (TOAL) Pro-Ed. Austin, TX	Vocabulary Syntax	11–18 yrs. old
Test of Early Language Development Pro-Ed. Austin, TX	Content and form	3–7 yrs. old
Test of Language Development (TOLD) Pro-Ed. Austin, TX	Vocabulary Syntax Phonology	4–9 yrs. old

screening purposes. Developmental scales provide excellent information about the broad deficit areas, but more in-depth analysis will still be needed to determine preferred communication modes and generalization of skills (Bricker, 1983).

Nonstandardized tests, as described by Miller (1978), can be modified to meet the needs of students not requiring the rigid administration procedures of

standardized tests. Teacher-made tests fall into this category and are often based on objectives covering areas such as elicited imitation, comprehension, sound production, and free speech analysis.

Teachers can devise nonstandardized or informal exercises that test their students' abilities in the areas of phonology, semantics, morphology, syntax, and pragmatics. An excellent technique is to tape record samples of a student's speech and analyze its quality based on these categories. Table 11.2 provides examples of some common errors students might make that can alert teachers to the need for developing remediation activities.

The last category, behavioral observation, deals with direct measurement of learner behavior and includes useful techniques for teachers, especially when it is important to assess the generalization of communication skills to community settings. This system defines in measurable terms the exact movement that the learner will engage in (e.g., number of requests by manual signs) and records the occurrences of the behavior(s) in varied settings. (Review Chapter Five for a more detailed discussion.)

Areas to Assess: Considerations for Teaching

What communication skills should be taught to individual students is one of the more difficult questions that teachers face. Unfortunately, the answer to it may often be based solely on whatever commercially produced program is available in a given classroom. A teacher may find it easier to compare the learners' skills to the criteria of the program, fitting each student somewhere into the scheme of activities presented in the teacher's manual. Retarded learners with severe communication deficits require a far more intensive assessment system geared to their particular needs. Therefore, teachers may wish to consider additional techniques for gathering the type of information needed for specific learners.

TABLE 11.2 *Examples of Form and Syntax Error Analysis*

<i>Stimulus</i>	<i>Student Response</i>	<i>Assumed Causes for Problem</i>
You	"OO" ↓	Phonology (expressive)— consonant
Go get the tool.	Go to the pool.	Phonology (receptive)— discrimination problem
He walks to school.	He walk to school.	Morphology—omits endings
Bobby's ball	Bobby ball	Morphology—omits endings
He drives the car.	He drived the car.	Morphology—plurals
Where is the ball?		
The ball is on the floor.	Ball floor	Semantics—problems with subject location



IDEA FILE



Harris-Vanderheiden and Vanderheiden (1977) have outlined eight basic considerations for developing communication programs for severely handicapped learners.* Although their approach was designed for nonvocal students, many of the considerations have implications for all retarded learners. The following considerations are adapted from their list and should make an excellent beginning point for deciding what to assess and which method(s) to use to obtain the best information.

1. The learner's current communication ability should be established, including the extent to which he or she can functionally communicate. The functional level of the learner will dictate the best assessment instrument to use. In general, however, for more severely retarded learners behavioral observations used in conjunction with developmental scales can provide the teacher with information on both what to observe and how to observe it.
2. The learner's current and future communication needs should be determined. Observations should address areas such as the number of attempts made to communicate with others as well as the number of times that others "pick up on" or recognize the student's attempts. In addition, Harris-Vanderheiden and Vanderheiden (1977) have suggested that professionals note why the communication was initiated. For example, does the learner communicate to give information, obtain something from another, or express intentions?
3. An observation system can easily be designed by teachers to record the learner's motivation or willingness to communicate. That is, a simple count of the student's attempts to communicate will provide a measure of motivation. If there is a tendency to provide for all of a severely retarded learner's needs in the classroom, the student's motivation to communicate may be minimized. Teachers should be careful of such situations and structure activities that increase the probability that the student will attempt to communicate with others.
4. The question of whether or not a given learner will be able to develop vocal communication as his or her primary mode should be a priority concern for teachers. It is assumed that all learners should be or can be taught to articulate sounds; therefore, speech therapists and teachers tend to develop programs solely for vocal communication. Harris-Vanderheiden and Vanderheiden (1977) suggested that if students are physiologically capable of producing sounds they should be taught to use speech. However, many severely retarded and multiply handicapped learners can be taught a complementary method of communication in conjunction with the speech training. Assessment of their communication abilities would also include information to assist teachers in identifying the instructional techniques best suited to them.
5. Environmental assessment has been basic to the philosophy of this text. When assessing a learner's communication needs, the teacher should consider the setting in which the student functions at present and the projected setting toward which it

*"Basic Considerations in the Development of Communicative and Interactive Skills for Non-Vocal Severely Handicapped Children" by D. Harris-Vanderheiden and G. Vanderheiden, in *Educational Programming for the Severely and Profoundly Handicapped* (pp. 324-327) edited by E. Sontag, 1977, Reston, VA: The Council for Exceptional Children. Adapted by permission.

is hoped the learner will move. For example, a secondary school student eligible for a community work site may need to learn a set of skills different from those needed by a student in a self-contained special education class. A retarded learner living at home may require different communication skills from a person living in an independent group residence.

6. Determining with whom the student needs to communicate is an important consideration when assessing learner needs. A good example of this concern involves hearing impaired learners. Teaching a hearing impaired student to communicate only via the Signing Exact English system may restrict the learner from communicating with hearing impaired people who have learned American Sign Language. Similarly, a severely retarded student who learned to communicate via a language system involving symbols would need to be in an environment where a significant number of others understood the symbol system. Under such circumstances the teacher would have to ascertain the willingness of others to participate in learning the alternate communication system.
7. The communication program should go beyond the learner's present communication goals. This requires program developers to actively evaluate each learner's future "educational and vocational goals" (Harris-Vanderheiden & Vanderheiden, 1977, p. 327), familiarizing themselves with the learner's most likely future environment by assessing potential employment outcomes.
8. The last consideration involves evaluating parental and professional resources that are available to assist in program implementation. The multidisciplinary team is essential for this; it includes professionals who are expert in various approaches to communication and parents, who are needed to participate in stimulating their child's language use.

The eight assessment program considerations listed in the Idea File should provide practitioners with information about a learner's present and future communication needs. It is also important to obtain specific assessment information identifying the various input and output modes related to student strengths and weaknesses. Depending on the student, information may be received through visual, auditory, tactile, or olfactory modes (Sailor, et al., 1980). In the same vein, a student's output mode (expressive language) can include speech, manual sign systems, fine motor movements or gross gestures, use of symbol systems, or any combination of these methods (Hollis & Carrier, 1978). Assessment of students' input modes focuses primarily on their ability to use their senses to discriminate, while assessment of their output modes focuses on the "motoric capabilities" of the learners (Sailor, et al., 1980).

Specific-Level Assessment

One of the most pressing concerns of the teacher and the IEP team is to decide whether to target speech, an alternate communication system (e.g., manual signing), or a combination of both as the primary expressive system. A general rule of thumb is that if speech is a possibility at least some instructional time should be

devoted to teaching those skills. The first decision, then, is to judge whether or not vocal communication is possible.

The first step is to evaluate the student's use of his or her senses. Since traditional hearing and vision screenings conducted in public schools may not provide adequate information for severely retarded or multiply handicapped learners, specialists may be required to measure visual acuity, visual field, and the extent of a hearing loss. In such cases, when the deficit can be corrected to some degree, a prosthetic device can be prescribed.

In-depth evaluations by hearing and vision specialists are not always possible at the time teachers need information, but this should not deter teachers from seeking input mode data from classroom observations.



IDEA FILE



The following are strategies adapted from Sailor, et al. (1980) for assessing a learner's input mode.*

1. Make sounds when the student is watching the teacher's face and when the student is looking away. Record the accuracy of the student's imitation of those sounds if an imitation was attempted.
2. Structure situations to observe a learner's responses (or lack of responses) to various environmental sounds presented when the student is both on task and off task. For example, a bell may be rung, first on the student's right side and then on the left side, while an observer notes changes in eye movement, body positioning, and facial expressions. Vary the distance of the stimulus from the student as well as the method of stimulation.
3. To test whether or not a student's eyes are working together to provide meaningful input, a brightly colored object or bright penlight will be necessary. Position the learner to look directly at the teacher, introducing the penlight at nose level. When the eyes are working together, the light will be reflected in both pupils simultaneously. Testing a student's ability to track can be accomplished in much the same way by passing the penlight across the learner's field of vision and watching for both eyes to follow the light in conjunction.
4. A final test suggested by Sailor, et al. (1980) for assessing the extent to which a student's eyes are working together also requires a brightly colored object or penlight. Move the penlight 18 inches from nose level toward the learner. From the distance of 18 inches up to about 4 inches from the nose, the penlight should be reflected equally in both pupils.
5. It is important to test a student's visual field if the use of a communication board is projected. A restricted field of vision will have to be remediated before students can scan the space in front of them. To test for this, use bright objects or the facial expressions of an adult moving in front of the learner in a semicircle from ear to

*"Language and Severely Handicapped Persons" by W. Sailor, et al., in *Methods of Instruction for Severely Handicapped Students* (pp. 78-99) edited by W. Sailor, B. Wilcox, and L. Brown, 1980, Baltimore: Paul Brookes. Copyright 1980 by Paul Brookes. Adapted by permission.

ear. If a visual scanning impairment is suspected, a specialist can provide more in-depth testing. However, with such information a teacher can begin to design a program to teach the learner to move his or her head to scan.

Using informal techniques, teachers can gather information that will help identify the best output mode for a given learner.

1. Teachers must be aware of the tendency to label strange noises (e.g., clucking) as inappropriate vocalizations to be targeted for elimination. The possibility exists that because of the teacher's value system a potentially useful behavior will be eradicated. It may be helpful to carefully record all the antecedents of the learner's vocalization and analyze what activities the learner is engaged in when the behavior occurs. For example, the student may engage in a stimulating behavior such as clucking during downtime in the classroom or during a boring, slow-paced activity. A vocalization of any type may be a potential beginning point for teaching, and it must be given careful consideration before it is targeted for elimination.
2. A student's ability to learn to imitate the sounds and actions of others will often dictate whether or not communication via speech is an appropriate output mode (Sailor, et al., 1980). Two questions have to be asked regarding a learner's imitation skills: (1) Given the best instructional procedures available can the student learn to imitate various sounds? (2) Given that the student can learn to imitate sounds, are the necessary resources and time available to teach the student to communicate? The answer to the first question can lead to a serious teacher error if all methods of instruction have not been systematically applied. It may be determined that the learner cannot learn to imitate when, in fact, the instructional strategies were not appropriately administered. The second question should be addressed by the IEP committee, based on information such as the student's age, years left in school, and present communication needs. For example, an older, nonvocal student may benefit from gestural or communication board instruction before instruction in imitation of sounds.
3. If the decision is made that the student has a better chance to learn to communicate using an alternate system, information must be gathered concerning the learner's fine motor movements with hands, arms, eyes, head, and upper torso. The student's manual dexterity, then, is an important prerequisite (Sailor, et al., 1980).
4. When manual communication is chosen as the primary output mode, teachers, staff members, and significant others should also be trained in order to facilitate communication with the student (Duker & Morsink, 1984).
5. Once both speech and manual communication are ruled out as output mode possibilities, the teacher should begin to evaluate the efficacy of various communication board systems.
6. Learners should be presented with a communication system that they can use at their current level of functioning (Harris-Vanderheiden & Vanderheiden, 1977). Therefore, the teacher must assess whether or not the student can associate the meaning of words to events, tasks, objects, persons, etc. If not, an appropriate beginning point may be a picture or symbol system (Sailor, et al., 1980).
7. The choice of which communication board is appropriate will depend upon the learner's strengths and weaknesses as determined from the assessment data gath-

ered (Fristoe & Lloyd, 1979). Sailor, et al., (1980) have identified three types of communication board aids based on the the type of processing the student is required to do—scanning, encoding, or direct selection—listed here in order of difficulty from least to most sophisticated.

8. Harris-Vanderheiden and Vanderheiden (1977) outlined six factors that practitioners should consider in the evaluation process for choosing an appropriate technique for a given student. (Some of these factors were previously mentioned by other authors and are reemphasized here for review purposes.)
 - a. The student's current vision and hearing status.
 - b. The student's method of mobility.
 - c. The student's positioning and posture.
 - d. The student's best physical strengths.
 - e. The student's ability to "associate, store, and retrieve meaning associated with pictures, words, and events." (See Harris-Vanderheiden & Vanderheiden, 1977, p. 324, for a detailed description of these approaches.)
 - f. The student's present ability to read and recognize words.
-

Specific-Level Assessment for the Mildly Retarded

Phonemes are the most basic unit of language, consisting of sounds that when combined with other sounds form words. Analyzing a student's ability to produce phonemes can be accomplished by collecting stimuli (e.g., pictures or objects) that contain target sounds and using them to elicit the student's speech. For example, if the student says "pall" when shown a ball, the response on the sound "b" can be scored as incorrect.

Morphemes are the smallest parts of language that have meaning; they include root words, prefixes, and suffixes. Many teachers informally assess this area by using open-ended sentences, as in the following example:

The man *drives* the car.

The man is the _____. Answer: *driver*.

Specific-level assessment of syntax (rules of grammar) can take both written and oral form. An effective approach is to tape record samples of a student's conversations and analyze them for the grammatical rules of interest. Semantics, which involves the meanings of words and their relationships to other words, can be assessed using the same language samples obtained for the syntax analysis.

Measuring Communication Behavior

Up to this point, the discussion has emphasized the "what" to assess at both the survey and specific levels. The various methods of assessment were touched upon

earlier, however, teachers may now benefit from additional suggestions concerning the application of one specific technique. Specific-level assessment provides the most useful information for program development. This information is gathered via criterion-referenced instruments or behavioral observations, and the decision concerning *what* to assess affects how the information will be gathered.

For example, behavioral observations may take the form of tape recording a learner's verbalizations to judge the quality of sound formation, observing and recording the number of times a student makes a need known through gestures, and timing the length of time a student engages in a conversation with another individual. Hart and Risley (1968) used time sampling to measure the occurrence of spontaneous speech of preschool learners.

The first step is to decide what communication behavior(s) to increase in the student's repertoire. The following sections present program components (e.g., prerequisite skills, functional language, use of adjectives) constituting a list of potential communication behaviors. For now, a few examples may provide a basic indication of how behavioral observation can be used to assess communication behaviors.

1. A simple counting of the number of increasingly complex word pairs that a learner can imitate for example, preposition and noun (in, cup).
2. Interval recording, whereby the teacher records the number of time intervals in which the learner spoke.
3. The length of time a learner engages in grunting sounds that can eventually be used to shape more appropriate vocalizations.
4. The number of commands or questions to which a learner responds correctly.

These examples are all based on a common factor: The target behavior can be identified by some type of physical movement by the learner. White and Haring (1980) have provided an excellent discussion of learner movements and how to assess them as functional skills. As teachers and other professionals decide about *what* they want to know concerning the student's communication abilities, the next step is to translate the *what* into a movement that can be observed and recorded. For example, if the communication question involves asking a co-worker for assistance when trouble occurs on the job, the physical movement would be the actual request and a situation could be structured allowing a teacher to observe and record the occurrence or nonoccurrence of the target response. Similarly, when an interdisciplinary team decides that a severely retarded, multiply handicapped learner may benefit from a combination gestural and communication board program, the first task is to translate into movements the specific skills needed to complete the task. In this case, the type of hand, eye, and head movements that a student can initiate upon command would be observed and recorded and the behaviors (physical movements) not currently in the student's repertoire would be targeted for instruction.

The areas of assessment presented in this section provide the boundaries for "what" to evaluate. Translation of these assessment goals into movements by the

learner is necessary to provide the "how" to assess. Once this translation is completed the teacher can then observe and record the number of occurrences or the length of time the target behavior occurs.



KEY CONCEPTS



- The main techniques for assessing language skills are standardized tests, developmental scales, nonstandardized or criterion-referenced tests, and behavioral observation.
- Mildly retarded learners' language development can be adequately assessed at the survey level using commercially produced tests. The ability of these students to communicate effectively in social or other community situations will have to be assessed using direct observation.
- Some commercially produced language assessment devices are available that are designed for more severely retarded learners. These instruments may not provide information as useful as the techniques described by Harris-Vanderheiden and Vanderheiden (1977).
- Specific-level assessment is an intensive analysis of each deficit area identified in the survey-level assessment of a student's communication skills. This information can involve an inspection of one student's reaction to certain types of auditory stimuli or to another student's ability to speak using appropriate grammatical structure, for example.

PROGRAM IMPLEMENTATION

Prerequisites to Communication

Teachers generally are interested in targeting the skills important to a specific learner. A majority of retarded students will be able to produce vocalizations; therefore, a portion of these learners' programs will be devoted to teaching improved verbal behaviors. For learners who are severely handicapped and physiologically unable to produce sounds, an alternate system needs to be developed.

A major concern among professionals centers around the teaching of prerequisite skills of language. Most agree that for younger delayed learners who have not yet obtained the basic verbal behaviors, teaching verbal prerequisites is essential (Bricker, 1983; Bricker & Dennison, 1978; Bricker, Ruder, & Vincent, 1976). Others argue that there is little evidence to support the need to teach prerequisites before more advanced language structures (Guess, 1980).

As with many issues in education, there may not be an absolute answer to this debate. A combination approach establishing each student's present and future communication needs, tempered with teaching basic skills where warranted, may provide more than one option for the student.

Techniques for Teaching Prerequisite Skills

When dealing with severely retarded learners who have not begun to vocalize effectively or who vocalize poorly, the following suggestions may assist teachers in the program development process.

1. Bricker and Dennison (1978) suggested six generic procedures for teaching prerequisite language skills:
 - a. Observe the learner in the classroom, home, and community in order to note general functioning level.
 - b. Use a systematic assessment program that includes identification of entry behavior, a continuous monitoring system, and follow-up assessment.
 - c. Operationally define the target behaviors (e.g., will grunts be counted as vocalizations?).
 - d. Specify the length of each training session and decide beforehand the number of instructional trials to be covered in one session.
 - e. Develop activities that allow students to generalize the skills they have just learned.
 - f. Use small groups for communication training; stimulation among learners should facilitate the activity.
2. Bricker and Dennison (1978) and Bricker et al. (1976) suggested training in on-task behavior before getting into other skill areas. Devany, Rincover, and Lovaas (1981) began their program by teaching the following instructions first and dealing with the off-task behaviors as they occurred. In either case, the approach to take usually depends on the learner. For example, one student may continually stare at the wall. In this case, the first task would be to teach the students to look at the teacher. Another learner may occasionally leave his or her seat, prompting the use of a behavioral program to control that behavior while the student is being trained in imitation skills.
3. The student's ability to imitate the teacher is an essential skill for language training (Jones & Robson, 1979). Devany, et al. (1979) suggested that discrimination training appears to be the best alternative for teaching learners to imitate either gestures or vocalizations of sounds.
4. The techniques of chaining and shaping have proved to be quite effective in teaching imitation skills. Initially, the teacher will want to reinforce all vocalizations during a session, attempting to increase the overall number. Also, the teacher should reinforce the student for looking at the teacher's face, in particular the lips (Devany, et al., 1979). This action will facilitate imitation in later stages of the program.
5. To increase vocalization, some learners will have sounds like grunts or cooing targeted while others have consonants or vowels targeted (Bricker & Dennison, 1978). What skills are targeted depends on where the student is presently functioning.
6. As the learner increases the number of vocalizations produced during the session, the teacher gradually will attempt to get him or her to begin matching the

- teacher's vocalizations. At this point, the teacher reinforces only those vocalizations that the learner makes immediately after the teacher produces some verbal behavior.
7. Over time, only those verbalizations that sound like the teacher's verbal stimuli will be reinforced. This shaping of the student's response will serve to gradually improve the quality of the learner's responses.
 8. Another important program component for teaching prerequisite communication skills is training learners to imitate motor skills. Bricker and Dennison (1978) advocated beginning with teaching the learner to imitate actions that are familiar; for example, the teacher begins by imitating a movement made by the student. After a number of trials have occurred where the student has initiated the movement, a chain of movements should be established (e.g., the teacher provides the stimulus and the student responds).
 9. The next step in this process is to teach learners to imitate actions (movements) that are currently unfamiliar (Bricker & Dennison, 1978). To accomplish this, the teacher identifies a number of motor movements not frequently initiated by the learner (e.g., a complex arm movement or the shaking of a rattle). For students who are not able to imitate more complex motor tasks or tasks that are simple but unfamiliar, a series of teacher behaviors ranging from minimal to intensive intervention can be applied. For instance, a teacher can move from verbal direction and modeling ("move your arms like this") to verbal direction, modeling, and complete physical guidance. Subsequent training sessions would fade the more intensive techniques (e.g., total guidance) until the student can imitate from the model provided by the teacher.
 10. An additional technique for improving the learner's ability to imitate the sounds produced by others involves choosing sounds that allow teachers to physically prompt students through the task (Devany, et al., 1981). An example is the "p" sound, which the teacher can demonstrate by touching the learner's lips, prompting them to stay closed, and modeling the air flow through the lips. As students master sounds, new ones are added to their repertoire.
 11. Teaching students to imitate sounds may begin with sounds that are already in their repertoire, then move to sounds unfamiliar to them (Bricker, Dennison, & Bricker, 1976; Lovaas, 1977). For some retarded learners, an acceptable approach may be to teach them to imitate words they come in contact with in daily social or vocational situations.
 12. Once students have learned to imitate basic sounds, additional prerequisite skills generally involve labeling objects (including discrimination between objects), using objects in the context of language (drink from the cup), using prepositions (under) and using pronouns (my ball).

Implementing a Prerequisite Training Sequence

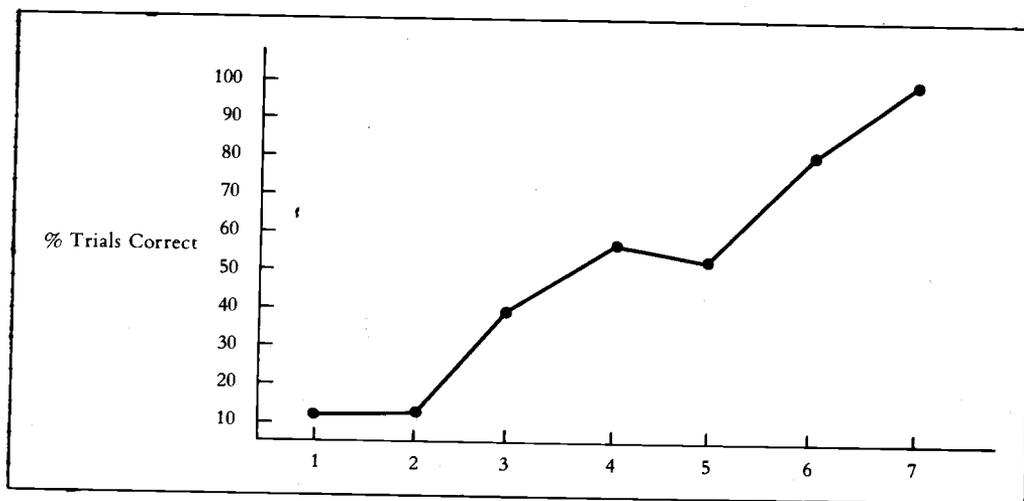
Teaching the prerequisites to verbal communication is an important program component. The success of such efforts, however, may depend on whether or not certain considerations have been addressed. One consideration is to monitor student progress closely by maintaining an ongoing error analysis. For example, a teacher may require a student to imitate the word "shoe" (stimulus). If the student's response is "to," the teacher can analyze the answer and establish a

probable cause (misplacement of tongue). Once the teacher and speech pathologist have analyzed the requirements of correct tongue placement, they can develop a prompt for the correct response. When teachers analyze the sounds students are making, they improve their chances for developing an effective system of shaping successive approximations. Error analysis of communication skills may best be accomplished by taking tape recorded samples of learner responses. Sounds made by a student can be played back many times to analyze components that could be shaped into more meaningful utterances.

Charting student responses works well in conjunction with error analysis. Using charting to monitor the daily progress of learners provides an actual picture of each individual's strengths and deficit areas. For example, a young severely retarded learner targeted for an increase of verbalizations may be cued to imitate the teacher's stimulus "ba." In this instance, the teacher charts the percentage of trials on which the student correctly imitates the sound "ba." The objective may be that the student will imitate the sound correctly over 100% of the trials. Using the chart shown in Figure 11.1, the teacher can make instructional decisions concerning any necessary program changes. By analyzing these data, the teacher notes that the student appears to be leveling off during sessions three, four, and five. Consequently, in order to increase the probability for additional success, a change in the instructional strategy may be necessary, for example, guiding the student by gently pressing his or her lips together.

Including parents as trainers is a second important consideration for implementing successful prerequisite programs. One basic disadvantage of teaching prerequisites is the amount of time it takes to teach many of these skills to some retarded learners. Parents can provide the additional help needed to teach these skills, and they can also provide the natural reinforcers that are a vital component of language programs (Guess, 1980).

Successfully incorporating parents into the instructional program depends on



■ FIGURE 11.1

Chart to Monitor Student Progress

the ability of teachers to provide them with the necessary skills for instructing their children at home. Parents should be invited to participate in a number of classroom training sessions, allowing time for the teacher to model the appropriate instructional techniques, correction procedures, reinforcer applications, and charting. Whenever possible, the teacher can accompany parents to their home, assisting them in setting up a training schedule and site and generally seeing that the training transfers over to the natural setting. As the student's program becomes more complex, the teacher can assist the parents by demonstrating how to implement the training procedures in places such as grocery stores and restaurants (e.g., teaching the phrase, "I want").

A final consideration in teaching prerequisites involves the use of functional versus simulated materials. Some teachers may find it easier to teach communication skills such as labeling and object use by incorporating pictures and/or replicas of the objects into their programs. To some extent, commercially produced language programs foster the use of both of the stimuli. The question of whether or not simulated materials are realistic enough to foster daily language development in retarded learners is important. At the present time, for example, the efficacy of using plastic fruit versus real fruit is still in question. However, the goal is to get retarded learners functioning in the community as quickly as possible. Therefore, it may be more reasonable to teach communication skills using realistic materials.

Commercially Produced Language Programs

Many fine language programs are available for use with mildly and moderately retarded students. These programs have been used with success and allow teachers to follow a structured approach that monitors student progress. Good teachers go beyond the scope of commercially produced programs, developing activities that allow students to practice learned skills while involved in the community.

For example, students may be working on skills involving grammatical rules using the Fokes Sentence Builder Kit (Fokes, 1976). Teachers can extend these lessons by structuring activities in community retail businesses where students can practice asking clerks who, what, where, and how questions. Bartel and Bryen (1982) have constructed a chart describing the most widely used language development kits. This chart is reproduced in Table 11.3.

Functional Communication Skills

Some mentally retarded learners do not have the ability to produce speech, while others have not yet gained sufficient skills to communicate their basic needs. Some learners even after vigorous, systematic training, have not been taught to imitate the vocal sounds of others (Sailor, et al., 1980). With students such as these, it must be decided whether or not something other than a developmental approach to

TABLE 11.3 Common Commercial Language Development Kits

Name (Author of Kit)	Target Population	Type of Approach	Comments
Developmental Language Lessons Levels 1 and 2 (Mowery and Replogle, 1977, 1980)	Language delayed; other handicapped	Spontaneous language use in structured setting	Emphasis on remediation for syntactic structures in 8 grammatical categories derived from Laura Lee's DDS test. Provides formal/informal diagnosis.
Developmental Syntax Program Revised Edition (Coughran and Liles, 1979)	Ages 3-10 who need syntactic remediation	Elicited response from pictures	Addresses syntactic errors in articles, negations, possessive pronouns, etc.
DISTAR I, II, III (Engleman and Osborn, 1970, 1973, 1975)	Preschool up	Drill and repetition; task analytical imitation and reinforcement	Highly structured and organized. Emphasis on expressive aspect of language. Moves from the familiar and simple to the more complex. Instructional groups based on performance levels. Heavy use of question-answer form of instruction—Teacher: "What's this?"—Pupils: (together) "That's a pencil!" Appears successful in teaching specific responses to specific stimuli; less adequate in generalizing to other situations.
Fokes Sentence Builder Kit (Fokes, 1975)	Learning disabled, deaf, hard of hearing, borderline to mild mentally retarded	Cognitive-psy- cholinguistic stimulative	Highly structured. Unique design for teaching syntactic rules and structures, but not as rote responses. WHO, WHAT, IS DOING, WHICH, WHERE.
Fokes Sentence Builder Expansion	Same	Same	Adds 3 grammatical categories WHOSE, HOW, WHEN
GOAL: Language Development—Games Oriented Activities for Learning. (Karnes, 1976a)	Normal to moderately handicapped	Developmental; stimulative	Highly structured. Based on Illinois Test of Psycho- linguistic Abilities model. Lessons in game format. Criteria for mastery of each lesson not predetermined.
Karnes Early Language Activities (Karnes, 1976b)	All mentally handicapped	Developmental; stimulative	Downward extension of GOAL (see above). 200 model lessons. Provides instructional ideas only; actual items must be supplied by user.
Language Rehabilitation Program Levels 1 and 2 (Hain and Lainer, 1980)	Aphasic; mentally retarded; hard of hearing		Emphasis on development of verb form. Cards depict familiar scenes, emphasis on retrieving sentences previously known by aphasics.

TABLE 11.3 (Continued)

Name (Author of Kit)	Target Population	Type of Approach	Comments
Monterey Language Program (Programmed Conditioning for Language) (Gray and Ryan, 1972)	All children needing help on language	Behavioral; operant	Highly structured. User must be trained and certified by distributor. Includes pre- and posttests, placement tests, branching provisions, specific criteria. Good data showing effectiveness, including transference.
MWM Program for Developing Language Abilities (Minskoff, Wiseman, and Minskoff, 1972)	Ages 3 to 11 with evidence of language deficits	Developmental; stimulative	Rationale is based on the model of the Illinois Test of Psycholinguistic Abilities. Comprised of a teacher's guide, inventory, manual, and materials. Provisions for diagnostic screening; remediation for weak areas according to model. Activities sequenced by difficulty level.
Peabody Language Development Kits (L. M. Dunn, J. O. Smith, & L. Dunn, 1981; L. M. Dunn, L. Dunn, and J. O. Smith, 1981; L. M. Dunn, Horton, & J. O. Smith, 1981; L. M. Dunn, J. O. Smith, & D. Smith, 1982)	All children	General developmental; stimulative	Purpose is to stimulate oral language, heighten verbal intelligence, and enhance school progress. Overall language stressed. Attractive and motivating. Kits contain manual, lessons, manipulative materials, reinforcement chips, and picture cards. Group instruction format. Research showing effectiveness is inconclusive.
Project MEMPHIS (Quick, Little, and Campbell, 1973)	Mild to severely handicapped	Developmental	Emphasis on language for verbal and nonverbal communication. 260 lesson plans based on three steps: planning, implementing, evaluation.
SYNPRO (Syntax Programmer) (Peterson, Brener, and Williams, 1974)	All ages with mild problems	Operant; drill	Can be used by professionals or aides. Provides a highly structured way of programming syntactic strings.
Visually Cued Language Cards (Foster, Giddan, and Stark, 1975)	Normal to profoundly retarded	Stimulation of functional language	Consists of five series of picture cards. Related to Assessment of Children's Language Comprehension Test. May be used at home or school.
Wilson Initial Syntax Program (Wilson, 1973)	Those with syntax problems, especially TMR	Stimulation; Chomskyian	Emphasis on improving receptive syntactic skills. Can be used by teacher aides.

Note: From *Teaching Children with Learning and Behavior Problems* (3rd Ed.) by D. Hammill and N. Bartel. Copyright 1982 by Allyn & Bacon, Inc. Reprinted by permission.



Using a communication board, this student communicates through the keyboard.
(Courtesy of Kay Shaw)

teaching communication is more desirable. An alternate approach that has been termed *remedial* involves teaching communication skills that are directly applicable to a student's life at a given point in time (Guess, Sailor, & Baer, 1977).

Systems such as the one proposed by Guess, et al. (1978) are based on the principle that students with a long history of failing to gain communication skills will not benefit from developmental goals. The answer may not be to place these learners into programs following a sequence similar to the one where they have already met failure. Instead, they may benefit from learning skills they can use immediately, allowing them to gain some control over their environment (Guess, et al., 1978). Using these skills also allows students to be reinforced in the most natural way.

The first step is to identify the most appropriate skills to teach based on a learner's needs (Lancioni, 1983). Unfortunately, this task is not an easy one, and there are no clear-cut guidelines applying to all cases.

Techniques in Teaching Functional Communication Skills

Hamre-Nietupski, et al. (1977) have suggested seven guidelines for identifying content when teaching communication by signing. Many of these suggestions also have practical applications for students who are learning to communicate via gestures, communication boards, and eye movements.

1. Teachers should consider developing activities around objects and places for which students show a definite preference. For example, instead of using any cup when teaching the label for that item, a favorite cup may be used.
2. Teachers should identify vocabulary that occurs frequently in the students' daily living environments. Words that have a high probability of occurring in a family situation, such as "toast" during breakfast, can be identified and targeted for instruction.
3. Early activities should follow a distinct sequence of skills representing words dealing with recurring events, ending actions, and the existing objects. Students are learning skills to control environmental objects. Students are learning skills to control environmental events by communicating events or actions such as "again" ("Do it again"), "stop" ("Please stop rocking me"), "no more" ("There is no more ice cream"), and "ball" ("This is a ball").
4. Motor skills required in nonverbal or total communication systems should be sequenced from simple to more complex movements. Teachers identify the sign or gesture they wish to teach the student, task analyze that sign or gesture, then begin teaching the skill sequence with the least complex movement.
5. Retarded learners who are unable to master the fine motor finger movements needed for many complex signs may be able to use touch signs as an effective alternative (Hamre-Nietupski, et al., 1977; Stremel-Campbell, Cantrell, & Halle, 1977). These signs involve using the hands to touch each other or using the hands to touch parts of the body in order to form the sign. Stremel-Campbell, et al. (1977) found that students could learn more signs at a faster rate using the touch versus the nontouch method. In cases where learners had a dominant hand, training involved the use of that hand for the major component of the sign and the weaker hand for the support component.



The Light Talker™ is useful for students without keyboard skills. (Courtesy of Pretke Romich Company)

6. Signing motions should be used that approximate the action or object that the sign represents. For example, if a student wanted a drink ("I want a drink"), the sign would involve the action of bringing the hand to the mouth. Similarly, if the student were labeling the object "chair," the sign would represent a sitting action.
7. Teachers should choose signs that do not resemble each other during the initial stages of instruction. A student probably has a better chance of discriminating between signs and learning the movement of each sign if there is a clear distinction between them.

Total Communication

There are a number of different definitions of total communication. As a philosophical issue, total communication can mean teaching the best method or combination of methods to meet both the present and future needs of a learner. Therefore, if there is any possibility that a student can communicate vocally, then all or part of the program should address those skills. On the other hand, for retarded learners who have a long history of being nonvocal or who are physiologically unable to produce meaningful sounds, alternatives such as signing, gestures, and communication boards or symbol systems are available. Some learners will benefit from learning skills from each of the communication systems, giving them immediate access to a number of techniques that may unlock communication barriers in their environments.



IDEA FILE



Both preservice and inservice teachers are encouraged to study additional in-depth sources that are available covering, for example, signing (Stremel-Campbell, et al., 1977); communication boards and symbol systems (Harris-Vanderheiden & Vanderheiden, 1977); prerequisite skills (Bricker, et al., 1975); and functional communication (Guess, et al., 1978). These sources as well as the others stated in this chapter can provide teachers with more detailed descriptions for developing each type of system.

Advanced Language Skills

Whether a retarded student is learning to communicate orally or will use an alternate communication system, it is necessary to teach advanced language skills. Language and communication are useful if they assist retarded persons in interacting with others in their environment. The probability of communication success should increase if the advanced language skills are tied to naturally occurring

events that are reinforcing to the learner (Kleitsch, Whitman, & Santos, 1983). Consequently, advanced language skills should be taught within the context of daily life events of the students.

Devany, et al. (1981) described a program that leads the learner from prerequisite skills to mastering the receptive and expressive use of four skill areas: prepositions (in, under, on, above); pronouns (my, his, I am); time-related concepts, (last, before); and yes-no concepts ("Is this a ball?" "Yes."). The remainder of the program involves teaching conversational skills ("How are you?" "I am fine."), as well as grammatical skills such as past tense and plurals.

Mittler (1976) has identified a series of seven kinds of questions that can be used by teachers to stimulate functional use of advanced language skills.

1. Labeling (nouns): "What is this?" "A cup."
2. Labeling (verbs): "What are you doing?" "Running."
3. Two-choice questions: "Is this a ball or a bat?"
4. Open-ended questions: "What would you like to do?"
5. Facilitating questions: "What happens next?"
6. Rhetorical questions: "Can you tell what this is?"
7. Maintenance questions: "What happened then?"

Questions one and two are designed to teach basic skills of communication, while question three involves teaching discrimination skills. Questions four and five assist retarded learners by allowing them to respond to a larger field of stimuli and begin to translate their thoughts into expressive responses. The last two kinds of questions are designed primarily to keep the learner communicating as much as possible.

The types of advanced language skills mentioned previously are fairly common skills to be found in many language programs (e.g., Spikman & Roth, 1984; Watson, 1981). For example, the Guess, Sailor, and Baer (1977) program includes skills that are clustered under four content areas: persons and things; actions with persons and things; possession/color; and size/relation and location. Identifying the kinds of skills that would benefit a learner may not be the most difficult job for the teacher. Instead, how to teach those skills once identified may be the area that requires attention.

The answer to this dilemma can be found earlier in this chapter and in other chapters of this text. Whether it be Bricker and Dennison's (1978) program to teach prerequisites; Devany, Rincover, and Lovaas's (1981) system for teaching advanced speech skills; or Guess, Sailor, and Baer's (1977) approach to functional communication, the common denominator involves the trainer's ability to effectively arrange antecedents to the learner's behavior. In addition to the arrangement of antecedents, the rate of student success is tied closely to the effectiveness of the consequences following the targeted behavior (Leonard, 1983).



IDEA FILE



Microcomputers can be a tremendous asset to retarded learners attempting to improve their communication skills (Geoffrion & Goldenberg, 1981). Currently available software can help mildly retarded students improve their grammatical structure. Hardware components such as speech synthesizers now allow students to practice speaking skills using computer-produced speech as a model. (Samples are presented below.) Hagen (1984) has provided the most complete list, and readers are encouraged to study her excellent book on microcomputers for special education.

Computer Assistance Language Program. Minneapolis, MN: Sysdata International, Inc.

Language Arts Skill Builders. Allen, TX: Developmental Learning Materials.

Lessons in Syntax. Beaverton, OR: Dormac, Inc.

The Microcomputer. Englewood Cliffs, NJ: Scholastic Software.

Techniques for Teaching Functional and Advanced Language Skills

At this point, readers should review the suggestions for teaching prerequisites to communication presented earlier in this chapter. The suggestions for teaching those skills are equally applicable to the instruction of more advanced skills. Following are additional points that teachers may wish to consider when implementing programs designed to increase the functional and/or advanced language skills of retarded learners:

1. Devany, et al. (1981) suggested that when teaching prepositions, trainers should first instruct learners in the receptive use of the word and then move to training the expressive use. After three or four prepositions can be understood by the learner, training in the expressive use of those same words can begin.
2. Devany, et al. also discussed a technique they call *stimulus rotation*, minimizing the possibility that the learner will "parrot" a response instead of actually learning the concept or word. Using this technique, the teacher presents one training stimulus ("In," for example, "Put the ball *in* the box."). The teacher works with the student until the student can perform the task in relation to a prespecified criterion (e.g., five out of five trials). At that point, the teacher switches to a new stimulus such as "over" until the learner meets the established criterion. This system continues by introducing new stimuli; however, the element of stimulus rotation also continues by randomly reintroducing words for which the student has previously met criterion. This technique continues until the student responds correctly on the first trial.
3. A common error made by some teachers is the unsystematic use of antecedents designed to maximize student response. Teachers may find it helpful to write

down the sequence of antecedents that they wish to use before the lesson begins. For example, complete manual guidance may be needed initially to get the learner to put the ball *in* the box. During subsequent trials, however, less intense antecedents can be implemented such as partial guidance, prompting using touch and pointing, or modeling. The important point here is that the teacher must use the level of antecedent that is right for a learner and that the antecedents must be applied in a systematic fashion (e.g., partial guidance until student reaches criterion, then pointing, etc.).

4. The type of antecedent that the student is working under should be recorded to monitor progress. For example, a chart might reflect that the learner required ten trials using partial guidance before he or she met criterion for putting the ball *in* the box. Similarly, the same learner may have met criterion for putting the ball *under* the table after five trials using touching combined with a pointing gesture.
6. Fading is an important procedure that works in conjunction with the application of antecedent events. Gradual fading from one antecedent event to the next allows learners to generalize their responses to the new teacher behaviors. Fading can also be used as a *fade-in* procedure. When teaching a word such as "in," it may not be possible to include the entire sentence ("Put the ball in the box.") if it confuses the learner. Rather, the teacher can begin by saying just the word *in* while prompting the desired response. During later trials, the remainder of the words in the sentence can be gradually faded in to the presentation (Devany, et al., 1981).
7. Real objects should always be used when teaching communication skills, and whenever possible teachers should start by choosing objects that have a functional use that can also serve as a reinforcer to the learner (e.g., a cup that can provide the learner with a drink of juice).
8. Teaching advanced/functional communication skills can be as time-consuming as teaching the prerequisites to language. Therefore, an important task for teachers is to organize and train parents, volunteers, and peer tutors to assume some of the responsibility for training the skills targeted in the student's communication program.
9. Many activities should be developed for which the sole objective is to get students to express themselves orally (Mercer & Mercer, 1985). For example, filmstrips and films that are not narrated can be used to generate discussions among students (Semel & Wiig, 1982).
10. Culturally different students should be encouraged to express themselves as much as possible. Teachers should not pass judgment upon the quality of their use of English, but should provide an appropriate model (Polloway, Payne, Patton, & Payne, 1985). For example, Polloway and Smith (1982) provided an example of how teachers can be good language models for students without singling them out. If a student says "Dese car look good," the teacher can model by saying, "Yes, these cars do look good" (1982, p. 84).

Generalizing Communication Skills

As with all skills taught to mentally retarded learners, a systematic program must be developed to enhance generalization of these skills and increase the probability that the students will be able to use the skills in daily life.

The first step in assisting students in generalizing newly acquired skills is fairly simple. Initially, the numbers of stimuli in a class should be increased to assist learners in generalizing across materials. For example, when teaching "Put the ball in the box," a number of different sizes, colors, and textures of balls can be used. This technique is essential when teaching the labeling of objects, for example, cups that come in many different sizes.

Another important aspect in programming for generalization involves structuring opportunities for retarded students to practice newly learned communication skills in as many settings as possible and with as many different people as possible. Communication skills cannot be generalized when they are taught in a half-hour language session daily. Instead, when a learner acquires the skill to communicate a need, such as "Want cookie," then the opportunity should be provided for the learner to make the request in the cafeteria and at home.

Techniques for Promoting Skill Generalization

In a previous chapter, the work by Stokes and Baer (1977) involving preferred techniques to promote generalization was discussed. Warren, Rogers-Warren, Baer, and Guess (1980) applied four of the principles from the Stokes article to the teaching of communication skills.

1. Train sufficient exemplars. Using this procedure, teachers would expand the number of examples that a student would be exposed to until the student was able to generalize the skill to new stimuli. Training sufficient exemplars relates to the previous discussion on applying new materials, settings, and persons. For example, mentally retarded students have been taught to expand action verbs into nouns by adding the *er* suffix (e.g., play-player, sing-singer) (Baer & Guess, 1971, cited in Warren, et al., 1980). A mean of four or five examples was required before the students could generalize the skill to new verbs.
2. Program for common stimuli. The types of antecedent events used in the original training setting can be transferred to additional settings to increase the probability for generalization of the learned skill. For example, if a teacher uses modeling to teach a series of gestures to students, then those same models can be used on visits to community sites to assist the learners in using the gestures in the new settings.
3. Employ a "training loosely" approach. This approach requires the teacher to systematically vary stimuli and formats for instruction (Warren, et al., 1980).
4. Use contingencies that can be consciously or unconsciously predicted by the student. The basis for this approach centers around the use of intermittent schedules of reinforcement so that the learner is reinforced for communicating in a more natural fashion.



KEY CONCEPTS



- Preschool and some elementary-age retarded learners will need instruction in developing prerequisites to communication.
- Care must be given to identify a learner's present and future communication needs.

- Some learners will need intensive instruction in skills involving imitation (the ability to model others).
 - Parents are important teachers of language/communication skills and should be encouraged to participate in the program.
 - Using real life objects and activities whenever possible may be more appropriate for teaching communication skills.
 - Severely retarded learners need to communicate immediately, using any means appropriate for the individual.
 - Mildly retarded learners may react best to one of the better commercially produced language programs. Teachers can choose a program based on the needs of their learners and availability of programs.
 - Skills learned by mildly retarded learners engaged in activities included in commercial programs and should be generalized as soon as possible to social and other community activities.
 - Peer tutoring can be an effective method for teaching communication skills and can assist learners in generalizing skills more rapidly if their peers accompany them to other social activities.
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DEVELOPING LEISURE AND RECREATION PROGRAMS

■ Leisure and recreation skills have been a neglected area of the curriculum for retarded learners. Some professionals may feel that teaching these skills is not the responsibility of special educators. Thus, exposing students to leisure and recreation skills may often be left to ancillary services such as adapted physical education classes.

RATIONALE FOR TEACHING LEISURE/RECREATION SKILLS

Program designers must decide the relative importance of spending instructional time teaching leisure and recreation activities (Ball, Chasey, Hawkins, & Verhoven, 1976). The answer may lie in analyzing the needs of retarded learners. The common thread that is interwoven throughout all levels of program development is the normalization principle. This principle implies that mentally retarded individuals should participate in community-based activities as much as possible (Martin, Rusch, & Laird, 1982). This approach becomes particularly important when considering that retarded individuals will spend a large portion of their day engaged in nonwork activities (Cheseldine & Jeffrie, 1981). Unfortunately, the freedom to visit community recreation facilities, blend in with the other patrons, and learn the skills necessary to become participants is not easily attainable for most retarded people. Since this is the case, there appears to be a need for teaching leisure/recreation skills to these learners before they can become active in recreation activities (Voeltz & Apffel, 1981).

(There are other reasons for assigning importance to teaching leisure/recreation skills. Some people may believe that these skills are acquired incidentally,



Mentally retarded persons must be taught leisure and recreation skills that will allow them to actively participate in community-based activities.
(Courtesy of Russell R. Grundke)

but this does not appear to be true for the general population or, therefore, for retarded learners. As retarded students become more independent in the community they probably will not automatically make better use of their leisure time. On the contrary, retarded learners will in some cases require intensive instructional efforts in order to learn leisure/recreation skills (Wehman, 1978).)

Most retarded learners have a limited experiential base and this may be a final rationale for building leisure/recreation skills into the total curriculum package. For example, if a retarded student is given the opportunity to do anything he or she wants during a given period of time, will watching television be a consistent choice? The point here involves excessive exposure to one or a small number of leisure activities. Television itself is not inherently bad; however, if it is the only option that a learner is exposed to, this form of entertainment may lead to a more passive existence (Katz & Yekutieli, 1974). The goal for professionals, then, is to expose students to a broad base of activities in order to enhance their social acceptance (Eichenbaum & Bednarek, 1964; Frith & Mitchell, 1983; Lathom & Eagle, 1982; McDaniel, 1971; Voeltz, Wuerch, & Wilcox, 1982).

There are two aspects to leisure/recreation programs: exposure and teaching new skills. If the quality of an individual's work life is linked closely to the quality of his or her leisure and recreation pursuits, then the need to incorporate these

options in the educational curriculum becomes more important. This chapter presents the basic curricular areas of leisure and recreation activities. In addition, strategies are included for assessing abilities to perform skills in these areas and techniques for teaching such skills.

LEISURE AND RECREATION SKILLS: THE IEP

Steps One and Two: The Community Needs Assessment (CNA)

The idea of assessing leisure/recreation skills may be a difficult concept for some individuals to grasp. People generally think of leisure skills as relaxing or having fun—thoughts that do not readily relate to assessment. Assessment of leisure/recreation skills, however, is a vital component in a program for retarded learners, and when it is implemented with some forethought, it should not interfere with the enjoyment of the activities themselves.

As with other curricular areas, there is a danger of identifying activities for retarded learners based solely on their mental age. Consequently, situations where 18- to 20-year-old students are found playing games involving nursery rhymes or are engaged in other activities geared for 3- to 5-year-olds may still be found in some school programs (Horst, Wehman, Hill, & Bailey, 1981).

The first step in the assessment process is to conduct a community needs assessment (CNA) to gather information concerning the types of activities available based on the chronological age level of students (Schleien, Kiernan, & Wehman, 1981). An initial task involves canvassing a cross-section of community members to identify their leisure/recreation activities. For example, a secondary school teacher of retarded learners may sample students by age level from the high school, recording the activities they enjoy. Similarly, the needs assessment can be expanded to other members of the community in order to develop a better picture of the leisure trends across a broader base of people (Voeltz, Wuerch, & Bockhout, 1982).

The need for establishing community validity when choosing leisure/recreation skills for a curriculum is twofold. First, a host of activities can be introduced to retarded learners similar to those other students the same age consider enjoyable (see Table 12.1). This consideration helps teachers develop a more realistic attitude toward the kinds of skills to include in their programs.

Second, a community needs assessment helps to pinpoint local resources by geographic location. For example, individuals on one side of town may bowl more than individuals in another area because of the bowling alley's location. Similarly, an electronic games arcade may be located within walking distance of a group home for retarded individuals, making it a potential source of recreation that is easily accessible. Program developers must be thoroughly aware of the types of leisure and recreation activities available in a given community and in specific locations within the community.

TABLE 12.1 *Community Needs Assessment of Leisure/Recreation Skills*

<i>Skills Involving a Group</i>	<i>Skills Involving the Individual</i>	<i>Resources</i>
Softball league ⁺	Bowling [*]	Mr. Jones, Manager
Stage craft—local theater group ⁺	Film viewing [*]	AJAX Lanes
Street basketball ⁺	Raising a dog or cat [*]	
Dance classes [*]	Fishing ^{**}	Ms. Barnes, Tropical Fish Enthusiast
Martial arts classes [*]	Maintaining an aquarium [*]	
Group camping trips [*]	Birdwatching ^{**}	
Volunteer work at a nursing home ⁺	Sewing ^{**}	Ms. Smithe, Coordinator Parks Department Recreation Program
Travel with groups [*]	Photography [*]	
Card games ^{**}	Reading ^{**}	
	Listening to music ^{**}	
	Swimming ⁺	Mr. Felton, Director YMCA
	Auto maintenance and small engine repair ^{**}	
	Gardening ^{**}	Mr. Paine, Owner Karate School
	Card games ^{**}	

⁺ No cost

^{*} Cost



IDEA FILE



There are a number of techniques for assessing leisure and recreation opportunities. The following are suggestions for developing and implementing a survey designed to identify community-valid activities.

1. Community volunteers, parents, general education peers, and educational support personnel can assist in gathering CNA information. These surveyors can begin by using the telephone and visit selected sites during the later phases of program development when activities must be analyzed.
2. As a method of efficient organization, data can be clustered according to similar properties. For example, when high school students are sampled to find out how they spend their leisure/recreation time, the information can be organized by age and geographic location of the student's home. Another example might be to cluster identified activities in categories such as paid or unpaid and group or individual.

3. A filing system can be developed based on this cluster system, allowing teachers to keep a record of vital information about each activity and community site. If a bowling alley has been identified, pertinent information might include the name and phone number of the manager, hours of operation, transportation required for attendance, equipment needed, and whether the equipment can be rented or must be purchased.
 4. Recreation specialists located in the community should be contacted. Often the parks department has at least one person who coordinates community programs. These individuals can be a vital resource for helping teachers to develop a thorough community analysis.
 5. The list of potential leisure/recreation skills presented by Bigge (1982) can provide a good frame of reference for beginning the survey. (See Step Three).
 6. Identified activities can also be classified according to the age-appropriateness of the task. For example, some activities may be more appropriate for individuals over a certain age while others may be more appropriate for children.
-

Step Three: Identifying Potential Annual Goals

A complete leisure and recreation curriculum provides a continuum of skills beginning with the basics of learning how to play and continuing through advanced leisure skills (e.g., intricate hobbies). Accordingly, curricular options involving these skills should be incorporated into programs for retarded learners at all levels. The first task for teachers, then, is to identify the curricular areas they wish to incorporate into their programs. Bigge (1982) has identified 13 curricular areas that provide an excellent base for a varied program:*

1. Arts: film viewing, film making, painting, textiles, photography, ceramics, art appreciation (e.g., Burmeister, 1976).
2. Cognitive/Mental: jigsaw puzzles, crosswords, anagrams, other word and number puzzles, electronic games and puzzles, knowledge and word games.
3. Crafts: woodworking, metalworking, sewing, leather, jewelry.
4. Drama: performance, stage craft, theater appreciation, affective learning activities (mime skits), (e.g., Maynard, 1976).
5. Games: group games, card games, board games.
6. Hobbies: collections, cooking, auto maintenance, food appreciation (gourmet, wine tasting, etc.).
7. Literature and Poetry: reading, writing, discussion groups.
8. Movement and Dance: body awareness through movement, perceptual-motor training, dance (social, folk, fad, modern, jazz, tap dance appreciation).

**Teaching Individuals with Physical and Multiple Disabilities* (2nd ed.) by J. L. Bigge, 1982, Columbus, OH: Charles E. Merrill. Copyright 1982 by Charles E. Merrill. Reprinted by permission.



Music can be an important component in developing a leisure and recreation curriculum. (Courtesy of Kay Shaw)

9. Music: vocal (performance, instruction), instrumental (performance, instruction, composition, music appreciation) (e.g., Schulman, 1980).
10. Outdoor: camping, hiking, boating, fishing, animal care, environmental awareness (e.g., Bundschuh, Williams, Hollingworth, Gooch, & Shirer, 1972; Eilium & Evans, 1982).
11. Social Service: volunteer work.
12. Sports: individual sports (golf, bowling, skiing, swimming) (e.g., Seaman, 1973; Sinclair, 1975), team sports (basketball, volleyball, softball, hockey, water polo).
13. Travel and Tourism: community exploration, local travel, organized tours, independent travel. (pp. 338–339)

This list of leisure/recreation activities is presented as a foundation for program development. Undoubtedly, teachers will be able to add to it depending on their own experiences and the geographic location in which they live. For example, activities such as martial arts training, roller and ice skating, and snow skiing can also be viable alternatives for retarded students.

Professionals should be wary of imposing their value systems on students. When reading a list of potential leisure or recreation activities teachers may tend to be paternalistic in choosing what they think is appropriate or inappropriate for retarded learners. For example, activities such as recreational hiking, judo, or

horseback riding may be eliminated because someone other than the retarded individual considers them to be too dangerous or inappropriate in some other way.

If professionals believe in normalization, then they should allow retarded learners to participate in the same activities as their general education peers. Teachers can follow certain safety precautions that are task-specific; that is, different leisure activities will require different precautions. Precise planning and effective teaching procedures (including adaptive equipment when necessary) can minimize the chance for injury and allow retarded learners the same opportunities available for any participant.

The potential annual goals identified by teachers can be generic across all severity levels of mental retardation. For example, skills necessary for attending a local movie can be appropriate for mildly, moderately, and severely retarded learners. The differences in the goals for each student will depend on the skills they realistically can obtain. The following examples of potential annual goals are written in generic fashion so that teachers can modify them based on the needs of their students.

1. Identifies all available local community recreation facilities.
2. Demonstrates proficiency in the use of community recreation facilities.
3. Participates in group recreation activities.
4. Demonstrates skills in a variety of independent leisure activities.

As with independent living skills, leisure/recreation tasks are excellent ways to increase contact between retarded learners and their nonhandicapped peers. Therefore, Brown's principle of partial participation (Ford, et al., 1980) is an important component. (See Chapter Ten for a discussion of partial participation.) Given adaptive equipment or assistance, a large majority of retarded learners can actively participate on some level.

PREREQUISITES TO OBTAINING LEISURE SKILLS

Many severely retarded learners of all ages and young mildly retarded learners will need instruction to help them improve their prerequisites to obtaining leisure/recreation skills. The developmental lag experienced by some mentally retarded learners may be so pronounced that the student is limited to the very basics of learning to play. The need to "learn to play" is easily noted in younger retarded children; and severely or profoundly retarded older students may still need to have program options that will enable them to develop those skills.

Stimulating the Senses

A person's ability to respond to basic sensory stimulation is a basic prerequisite for learning to play and to interact with the environment. Therefore, for individuals who are profoundly retarded, learning to respond to various forms of outside

stimuli can be an important first step (Wehman, Renzaglia, Berry, Schultz, & Karan, 1978). Some learners whose disabilities are so severe may react to stimuli with defensive behaviors, attempting to withdraw from the source of the stimuli (Granger & Wehman, 1979). This primitive response causes individuals to withdraw from touch, light, sound, or other stimulation entering their lifespace, making it difficult for others to interact with them.

Granger and Wehman (1979) identified curricular activities that are designed to increase the individual's sensory awareness in four areas: tactile stimulation, auditory stimulation, gustatory and olfactory stimulation, and visual stimulation. This program was designed to increase awareness of toys as well as interaction with objects and significant others by pairing them with various sensory exercises. These activities were also used to reduce the sensory defensiveness exhibited by some retarded learners.

Playing with Toys

Playing with toys is much more than a diversion for children. Toy play can be an important educational activity, allowing children to improve their fine motor skills while indicating their cognitive functioning (Wehman, 1979a). In addition, playing with toys allows children an excellent opportunity to learn appropriate social interaction. A child's ability to play independently in a constructive fashion is a desirable skill that helps both professionals and parents (Wahler & Fox, 1980). Finally, teaching children independent play skills can be considered a prerequisite to more advanced independent work skills. In fact, play is often considered the work of children. Unfortunately, some retarded learners have not learned to participate appropriately in either structured or unstructured toy play (Spangler & Marshall, 1983).

Wehman (1977a; 1979a) has been very active in the development of toy play programs for retarded learners. During the course of his work, he has identified six levels of a developmental sequence adapted from work in general child development. Exploratory play is the first level. It involves behaviors ranging from awareness of an unfamiliar stimulus to investigating the stimulus, determining whether or not it is safe for interaction. A child's ability to explore the environment and seek out new stimuli is a very basic, yet vital component of toy play.

The second level described by Wehman is independent play. This state finds the child playing alone for longer periods of time while interacting in an appropriate manner with objects. Some professionals suspect that successful independent play is a prerequisite for more intricate leisure skills (Wehman, 1979a).

Parallel and associative play are the next two levels described by Wehman. Parallel play finds children interacting with objects independently, but they are involved in the activity close to other children. Associative play allows children to become involved with others on a limited basis. For example, two children playing independently with trucks may occasionally make eye contact to see what the other is doing.



Learning to play with toys is an important educational activity that develops fine motor skills and cognitive functioning. (Courtesy of Gwinnett County Public Schools, Georgia)

Cooperative play is the next stage, and it involves close interaction among children, often with a group goal in mind. Cooperative play includes activities such as team sports, games, object construction, and telephone conversations.

Children have the best opportunity to interact socially with their peers at the cooperative play level. However, at this level initial instruction by adults is also vital. Communication, sharing, and acceptance of others are all cooperative play skills that can be taught.

The final stage discussed by Wehman (1979a) involves symbolic play. This area includes dramatization and imaginative play and can be considered a higher order form of play. Activities that are representative of symbolic play include use of puppets, doll play, and skits. Wehman has found that symbolic play is an excellent format for concept formation.

Children learn the skills at various levels and progress through each, building upon the skills learned at the previous step. Most children learn by watching models, either other children or adults. However, mentally retarded learners with severe developmental delays do not imitate well and will not necessarily demonstrate the types of toy play activities described by Wehman. Careful attention by educators to teaching the various levels of toy play will at least increase the probability that these students can gain some of these prerequisites to more advanced leisure skills.



KEY CONCEPTS



- Traditionally, leisure and recreation skills training for retarded learners has not been given much consideration in public school programs beyond adaptive physical education classes.
- The thrust of the normalization movement is to increase meaningful contact between retarded persons and their nonhandicapped peers. Leisure and recreation activities can be a natural vehicle for encouraging this contact.
- Many retarded learners will not acquire leisure/recreation skills incidentally. Mildly retarded learners can acquire some skills on their own; however, their repertoire may be limited. Moderately and severely retarded learners must be taught the skills before they can be expected to actively participate.
- Identifying leisure/recreation skills should be based on the age of the students.
- A community needs assessment allows teachers to identify activities engaged in by their students' nonhandicapped peers. Also, teachers can identify activities by their location or whether they fall into categories such as paid/nonpaid, individual/group.
- A CNA can also help teachers locate people in the community who are willing to volunteer assistance.
- Bigge's (1982) list of 13 leisure and recreation curricular areas can be an excellent base for developing annual goals. For example, a teacher could easily convert the outdoor activities suggestions into a number of goals, for example, "Demonstrate the skills necessary to fish from the bank of a river."
- Younger mildly retarded students and some severely retarded students may need instruction in the prerequisites to obtaining leisure and recreation skills.
- Sensory stimulation, appropriate use of toys, and appropriate levels of play can all be annual goals for some learners.

Step Four: Translating Goals into Potential Short-Term Objectives

Translating annual goals into potential short-term objectives is a first step to be achieved before an efficient assessment of student strengths and weaknesses can be made. These potential objectives are particularly important in the leisure area because standardized tests of these skills are either unavailable or inappropriate (e.g., a standardized test would be inappropriate for measuring ice skating skills). Therefore, most of the assessment techniques for leisure skills will involve using task sequences and direct observation of student performance on the subskills.

Before these task sequences can be developed, teachers should identify specific outcomes for the students. Potential short-term objectives allow teachers to pinpoint those outcomes, developing task sequences based on the objectives. For example, a potential goal for students may be: "Demonstrate the basic skills needed to ice skate." A resulting potential objective of this goal may take a form similar to the following:

Outcome: The student will be able to pay for skate rental, put on skates, start, stop and skate along the perimeter of the rink.

Context: Local skating rink.

Criteria: The student will fall safely.

The student will avoid collisions.

The student will make one complete turn around the rink without assistance.

Once this objective has been written, teachers have a guideline for developing the skating task sequence that can be used to gather assessment data.

Step Five: Assessing Student Entry Behaviors

Task analysis is one of the most important tools for professionals developing leisure/recreation programs (Wehman & Schleien, 1980). Breaking down a leisure/recreation activity into component subskills is the most desirable method for obtaining assessment information about any given learner.



What component subskills are involved in a task analysis of ice fishing? (Courtesy of Kay Shaw)

Basically, there are two methods for obtaining a series of task sequences. First, many have been developed by recreation specialists, particularly for activities involving the necessary adaptations that may be required for learners with physical handicaps.

The second approach involves more work on the part of program developers; however, it opens up a wider variety of activities for retarded learners. This task analytic approach involves observing a person in the process of performing a set of subskills and recording the steps in order of occurrence. Of course, there are different ways to do many tasks, but a careful analysis can identify the subskills most needed to compete the entire activity.

Fishing can provide an example for developing a task analysis. Probably the most favorable beginning point would be to identify one fishing activity that is less complicated than the rest. Lake or pond fishing from the bank of a river should provide a representative set of fishing skills that are not too advanced. Observation of a small number of people fishing may result in the following basic task analysis:

1. Locate a suitable site to obtain bait.
2. Locate a container for the bait.
3. Dig for bait (earthworms).
4. Place the worms in the container.
5. Locate and bring a fishing pole and equipment.
6. Identify an appropriate site for fishing.
7. Bait the hook (pole with no reel).
8. Cast the line into the water.
9. If the fish takes the bait, pull in the fish.
10. Use a net to hold the fish.
11. Remove the fish from the hook.
12. Place the fish in a container with ice.

This set of subskills is merely a representative sample. Certainly, different people approach the task in different ways. However, these subskills do provide a measure against which student strengths and weaknesses can be judged.

The key to effective use of a leisure/recreation task analysis as an assessment tool is to choose appropriate variables by which student performance will be measured. These variables relate to the specific behavioral characteristics such as how often the behavior occurs or the length of time that it occurs. In addition, some skills may require a measure of quality of performance (e.g., percentage of parts of a model airplane correctly assembled). Provided that the behaviors are defined in terms of physical movements by the student, observation procedures should enable the teacher to assess student participation and progress.

For example, Johnson and Bailey (1977) developed an observation system to evaluate the leisure activities (puzzles, card games, painting, weaving, and rug making) of retarded women. In this study the authors identified the important characteristics of each task such as the number of knots completed on a rug or

the inches of fabric woven. Other task-appropriate behaviors were also defined for observation purposes (e.g., dipping brush in paint, cutting yarn). Once these characteristics of the skills were identified, the retarded individuals could be assessed for such behaviors as length of time engaged appropriately in a leisure activity as well as a product measure (number of knots completed).

Another method for using a task analysis for assessing leisure/recreation skills involves identifying the antecedent behaviors a teacher uses to involve the student in the skill. For example, in the task analysis presented for fishing, the third step involves digging for bait such as earthworms. Assisting a student to successfully complete this step may require the teacher to use partial guidance plus verbal instruction. A coding system can be developed for recording the teacher behavior required to assist the student for each step on the task sequence. The task analysis can be placed on a recording sheet similar to the one shown in Figure 12.1.

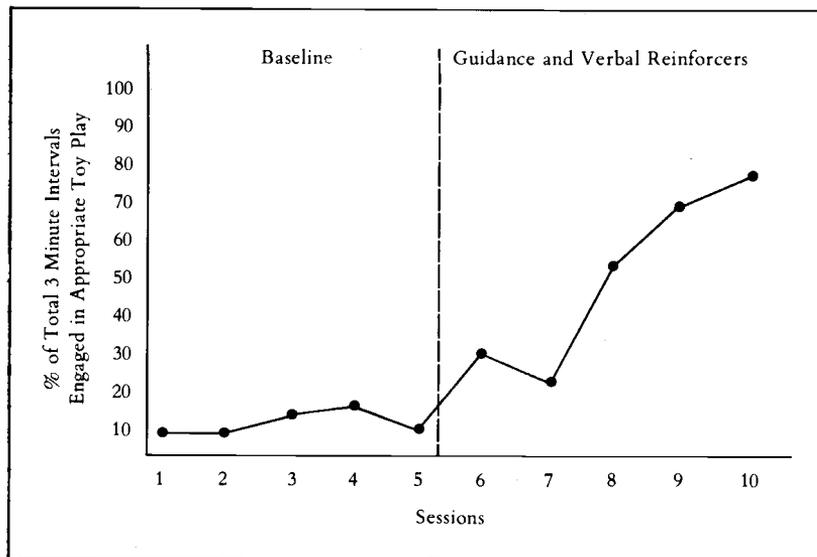
Generally, the system of recording chosen will depend on whether the skills being taught have been learned and need to be generalized to other situations or are not presently in the student's repertoire. For example, a retarded learner who has never fished would require various levels of teacher assistance to accomplish the task. On the other hand, if a learner were able to complete the entire sequence of skills, then the measurement system would be subject to change. The teacher may wish to record the length of time that the learner stayed on the task of fishing (duration) or even the number of fish caught in a certain period (frequency or rate).

Organizing Assessment Data

In previous chapters, charting was discussed as a method to organize data and monitor the ongoing progress of the learner. Charts can also be a valuable tool for

VI: Verbal Instruction	
M: Model	
PP: Prompt	
PG: Partial Guidance	
G: Total Guidance	
<i>Session 1</i>	
1. Locate site	VI
2. Locate container	VI
3. Dig for bait	PG
4. Place worms in container	P
5. Pole and equipment	P
6. Site for fishing	M
Etc.	

■ **FIGURE 12.1**
Task Analysis Recording Sheet with Teacher Behavior Codes



■ FIGURE 12.2
 Chart Monitoring the Length of Time a Student Engages in Toy Play

assessing leisure/recreation skills. As with all behaviors, the efficiency of the charting procedure used depends on the characteristics of the student's responses. For example, the behavior targeted for change may be the length of time a student engages in appropriate toy play. A potential charting procedure for that activity is depicted in Figure 12.2.

More advanced behavior analysis designs can be used to monitor student progress in leisure skills. A student who has acquired the skills necessary to participate in a number of community-based recreation activities may not have obtained the necessary task-specific skills. If a teacher is interested in seeing how a particular instructional technique would work across three separate activities (e.g., bowling, tennis, and pinball), a multiple baseline design may be appropriate for measuring potential changes in behaviors. Figure 12.3 is an example of how a teacher attempted to increase the number of steps completed according to criteria on a task analysis for each of the three activities.

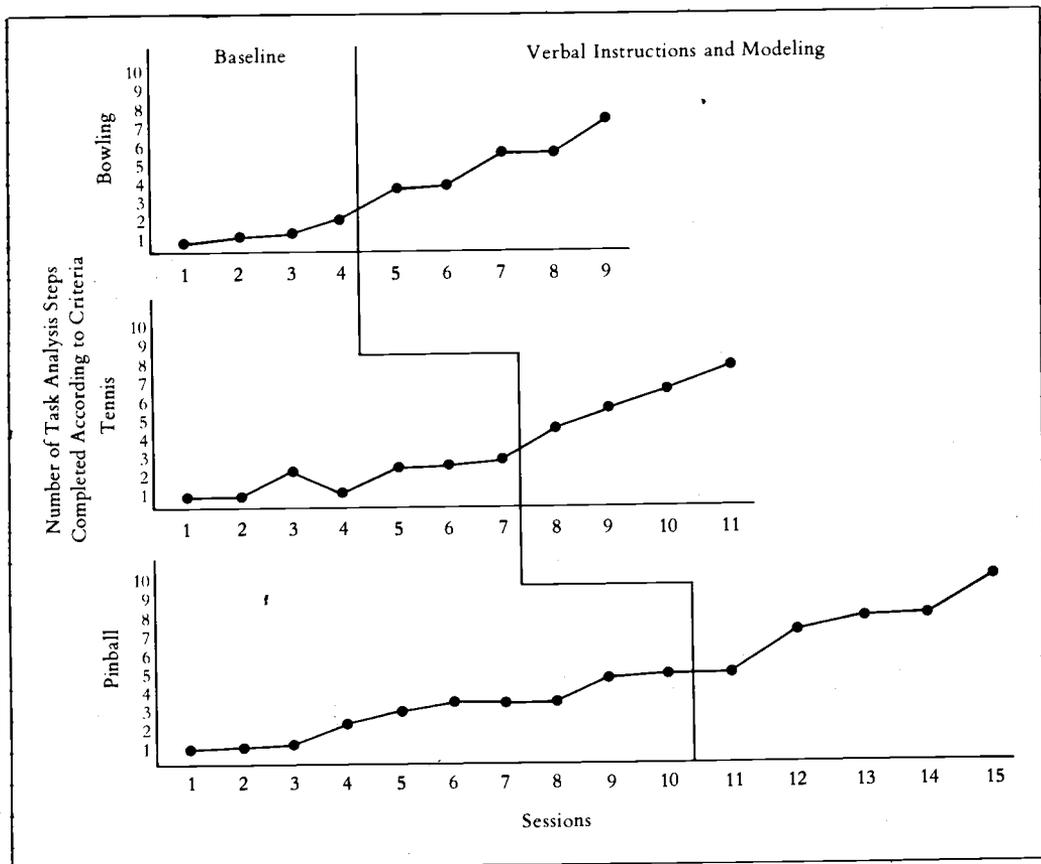
One technique for organizing assessment information that complements charting procedures is to conduct an error analysis. This procedure follows the same format discussed previously. Teachers can list the verbal stimulus that indicated what the student was to perform, the response (movement) that the student actually exhibited, and the assumed cause for the inability of the student to successfully complete the skill.

For instance a learner may be engaged in a unit designed to teach dog combing and brushing skills as a part of pet care. A simple task analysis for this activity might be similar to the following:

1. Locate a soft brush, a slicker brush, and a comb.
2. Comb out the dog's beard or the area around the mouth.

3. Use the slicker brush for snarls around the mouth.
4. Comb out the dog's back, sides, and rear.
5. Comb out each leg and paw.
6. Use the slicker brush for snarls.
7. Comb out the chest and stomach area.
8. Use the slicker brush if necessary.
9. Soft-brush the entire coat.

At the outset, the student would probably have difficulty with most of the skills sequenced in this task analysis. However, during the initial assessment the kinds of errors the learner makes are a vital piece of information.



■ FIGURE 12.3

Examples of Multiple Baseline Across Settings Design for Monitoring Student Improvement Over Three Leisure Skills



Learning to care for a pet can be a leisure and recreation activity that also teaches appropriate work skills. (Courtesy of Kay Shaw)

Step two, combing out the dog's beard or around the mouth area, involves being able to hold the dog's mouth closed with one hand while manipulating the comb with the other. (At the beginning of the task, a further skill is to be able to identify and use the side of the comb that has larger spaces between the teeth.) In this instance, the verbal stimulus would be: "Hold the dog's mouth closed with one hand." The response may have simply been that the student did not or could not comply. The student in question may have had a motor problem with the hand needed to complete the task. Therefore, the teacher now has some information to work with in order to begin teaching the skill. One possibility might be to use a brace on the learner's arm, while another adaptation might be to design exercises for increasing motor control and hand and arm strength.

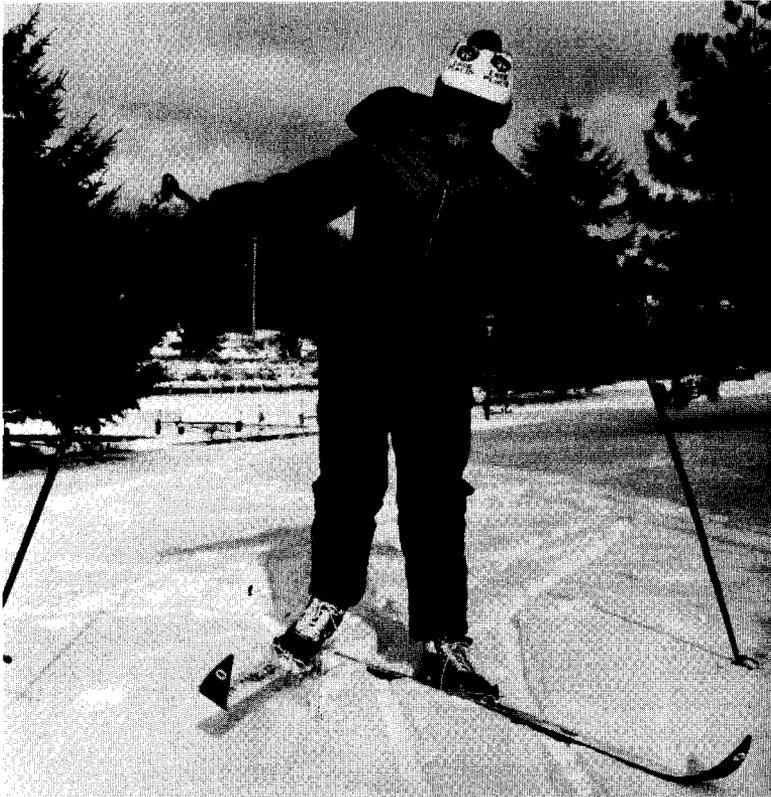
The use of an error analysis sheet may be looked upon as a tool for organizing assessment data so that it is useful for program development. Organizing data in this fashion allows the teacher to get a better picture of what variables are hindering the student from acquiring the skills necessary to complete the task.

Assessing Leisure/Recreation Preferences

The ultimate goal of a program to teach leisure/recreation activities should be to teach the individual how to participate in a variety of activities. Another goal is to teach students how to decide which activity is best for them to engage in at a particular point in time. Once these goals have been realized, the learner is better able to decide which activity to approach.

Teachers may wish to consider two approaches to assessing leisure/recreation preference. The first approach is to assess the initial preferences of the learner. Using this approach, the teacher structures varied situations where a learner is allowed to approach desired activities or objects while the teacher observes. This approach allows instruction to begin with the student's preferred choice.

The second approach is a follow-up evaluation designed to measure student preferences after instruction, when they have gained the ability to engage in a host of activities. This assessment activity allows the teacher to gather information as



An important consideration in teaching and encouraging leisure and recreation activities is the student's preferences. (Courtesy of Kay Shaw)

feedback into the program, which may result in changes in teaching techniques, curricular activities, and materials.

Students are allowed to make choices without the biases of the professionals entering into the picture. For example, a learner might be taught to cross-country ski. However, after a number of trials the student might decide that she does not like the prolonged exposure to cold weather. Teachers must avoid attitudes that result in statements such as, "We taught you to ski, now you *will* participate!"

Helping students to become more independent involves teaching them a variety of skills and allowing them to choose what they like best. Assessing leisure/recreation preferences allows teachers to observe the kinds of activities the learner chooses, not the activities chosen for the learner. This concept is important, particularly with severely and profoundly retarded learners. If students are nonverbal or have extreme difficulty in communicating their needs, it is difficult to discover their preferences. Because of this, there may be a strong tendency to dictate for them what they will do. Consequently, teachers should consider developing a system that allows these learners to express their desires. A simple, yet effective procedure is to develop picture notebooks comprised of snapshots of the learner participating in a number of leisure/recreation activities. The learner can choose from the pictures those depicting the preferred activity.



KEY CONCEPTS



- Task analysis in conjunction with direct observation of student performance may be the most appropriate format to assess leisure and recreation skills.
- Task sequences are available from recreation or adaptive physical education specialists. Generally, developing leisure and recreation task sequences that are specific to a community may provide the most useful tools for teachers (e.g., a task sequence for bowling can be different for two different bowling alleys).
- The criteria for completing a task or the characteristics of the task will become the units of measurement for assessing student performance. For example, the length of time a student engages in a card game or the number of activities a student samples may provide a measure of abilities or preferences.
- The level of teacher intervention (e.g., modeling, physical guidance) can be used as a criterion for measurement. Teachers might expect that as a student improves in the performance of a task the need for physical guidance by the instructor will decrease. The amount of physical guidance required during an instructional period can be an effective measure of student progress.
- Charting assessment data is a method for organizing and evaluating the information gathered and for demonstrating progress toward objectives.

PROGRAM IMPLEMENTATION

Identifying and Analyzing Short-Term Objectives

Choosing the right leisure and recreation short-term objectives for an individual has one consideration not pertinent to other curricular areas. If parents approve of the targeted skills and the student has the physical capabilities (with the use of adaptive equipment if necessary), then a primary concern may be exposure to the skills. Retarded individuals are less often exposed to a variety of activities than their nonhandicapped peers, and therefore less able to make choices concerning preference. Also, some leisure/recreation skills require some degree of ability before the activity can be employed.

For example, some people may not enjoy snow skiing until the basic snow plow technique is mastered. Once some basic skills are mastered, an individual may still choose not to participate in the activity (e.g., "Why did I learn to ski? I really don't like being out in the cold and snow."). The short-term objectives chosen for a student's IEP should provide for exposing the student to a variety of activities, teaching some of the basic skills, and then allowing a choice of the activities preferred.

Developing Instructional Strategies

Methods and adaptations for teaching leisure/recreation skills to retarded and other handicapped learners is an area marked by new and innovative approaches. Professionals in special education and recreation are continually striving to improve upon existing procedures for teaching varied types of skills. Consequently, skills previously thought impossible for handicapped learners have now become part of the repertoire of many retarded learners.

The technology to teach such skills exists and has been demonstrated in a number of research efforts (Johnson & Bailey, 1977; Wehman, 1977b, 1978; Wehman, Renzaglia, Berry, Schultz, and Karan, 1978). Apparently, what remains is for teachers to become interested in this curricular area.

Structured Versus Unstructured Activities

Some teachers believe that students will grow socially if left to participate freely in group or individual leisure activities with no interference from adults. In these situations, the children involved "teach" each other the many socially acceptable ways to engage in activities, or the individual alone explores new and different methods of amusement. Unfortunately, for learners to engage in these unstructured approaches they must first have mastered basic prerequisite behaviors, a problem hindering many retarded learners. Conversely, an approach that may facilitate learning recreation skills by retarded students is to develop activities that move the

individual from a structured setting gradually toward an unstructured one (Lagomarcino, Reid, Ivancic, & Law, 1984).

Some teachers provide specific times each day when the learners in their classes can engage in "free time" activities. This free time is often contingent upon the student's behavior (e.g., if you're good you can have 10 minutes of free time). Retarded learners who have not learned appropriate play behaviors or who cannot use free time wisely will have the tendency to engage in repetitious activities with no objective. For example, a group of severely retarded learners might be observed thumbing through piles of magazines during their free time, obviously lacking an objective since they cannot read the magazines and in some cases may not be looking at the pictures. Free time periods that encourage behaviors such as this or encourage endless numbers of pegboard tasks may be reinforcing inappropriate play or leisure behaviors.

Teachers should consider treating free time as a learning experience and schedule these sessions as if they were teaching an academic skill (Orellove, 1982). Depending on the functioning level of the students in question, initial activities and instructional interventions will probably require a good deal of structure. Accordingly, the tasks that the teacher has analyzed for assessment and instructional purposes will provide the structure necessary to convert free time into more meaningful experiences. As students gain the skills to actively participate in a number of games or engage in the appropriate use of toys, nonstructured free time can become a time of choice for their enjoyment.

Social Skills and Leisure Activities

Socially relevant skills may best be taught if they are interwoven throughout other aspects of the program (Gaylord-Ross, Haning, Breen, & Pitts-Conway, 1984). Leisure and recreation activities provide a natural setting for instructing retarded learners in appropriate social responses. Social skills range in difficulty from simple greetings (e.g., "Hello") to more complex ones such as hugging friends (e.g., discriminating when it's appropriate to hug). Other skills include respecting the social distance of others, accepting and giving criticism, carrying on simple discussions, requesting items or information from others, and maintaining appropriate self-care skills.

When developing task sequences for learning leisure/recreation skills, teachers should include subskills relating specifically to socially appropriate behavior. For example, a task sequence designed to assist in teaching playground skills could include subskills such as taking turns, requesting a turn, and carrying on simple conversations with others. It could also involve learning social skills such as controlling anger when activities become contested (Kolko, Dorsett, & Milan, 1981).

Another example is teaching mildly retarded students to engage in a variety of activities at a local YMCA or YWCA. Teaching these students the skills needed

to play in a “pick-up” basketball game, lift weights, swim, attend aerobic dance classes, or play ping pong can be expanded to include more complex social skills. Requesting assistance from the locker room attendant, dealing with an argument during a game, and praising others for their good play are all examples of social skills that can be taught during leisure/recreation activities.

Techniques for Teaching Leisure and Related Social Skills

Proper arrangement of conditions, materials, and teacher behaviors that precede the student's targeted response may dramatically increase the probability that the response will be in line with prestated criteria. Appropriate use of consequences, applied contingent upon the learner's response, will also improve the chances that the targeted behaviors will either increase or decrease as the teacher wishes. These two basic principles of teaching have been cited throughout this text, and they are equally applicable to teaching leisure/recreation skills.

Arranging antecedent events to teach leisure skills can range from varying the types and numbers of activities available to matching the most appropriate model to the student's need (Wehman, 1979b). In a number of studies, Wehman and his colleagues have discovered, for example, that the proximity of toys to the learner can account for whether or not the student will engage the objects. In other words, the closer the leisure materials are to the student the greater the chances are for “activity” and “spontaneity in recreation sessions” (Wehman, 1979b, p. 79).

There also appears to be some support for materials preference as a factor in learning leisure skills. Wehman (1978) discovered a definite rank-order preference for certain toys and games among severely retarded learners. If teachers can discover what particular materials appear to be motivating to a target learner, then the chances for teaching skills associated with those objects may be greater (Foxy, McMorrow, & Schloss, 1983).

Finally, a most important set of antecedent events involves the appropriate application of certain teacher behaviors. The quality of verbal instructions, models, physical prompts or cues, and manual guidance procedures can greatly enhance student learning (Neitupski & Svoboda, 1982). For example, children often learn more effectively from models of similar ages; therefore, teachers may wish to use peer models to teach leisure/recreation skills (Schleien, Certo, & Muccino, 1984).

Consequences, when properly applied, can produce remarkable changes in student behavior. Depending on whether the behavior is targeted for increase or decrease, tangible, social, or negative reinforcers can be effective. Punishers would only be used as a consequence in extreme cases for those behaviors that can cause injury to others (e.g., hitting another child with a toy) and only after thorough review by the IEP team. However, most behaviors such as engaging in the task or learning certain skills will respond to tangible or social reinforcers. The same rule holds true here as it does for other skill areas: Match the reinforcer to student preferences and apply it immediately after the behavior occurs.



There are a number of excellent resources to help teachers by providing additional examples of leisure and recreation programs and teaching strategies validated by research studies. The following is a representative sample of topics and authors that may provide additional ideas:

- Techniques for teaching the institutionalized retarded (Adkins & Matson, 1980)
- Leisure curriculum for mildly retarded students (Frith, 1980)
- Using toys to reduce self-stimulation (Flavell, 1973)
- Leisure and recreation curriculum development (Ford, et al., 1980)
- Teaching dance skills (Glover, 1979)
- Leisure skills as enrichment exercises (Horner, 1980)
- Play training and Overcorrection to reduce self-stimulation (Kissell & Whitman, 1977)
- Using modeling and social reinforcement to teach leisure skills to mildly handicapped learners (Schleien, 1982)
- Leisure skills—curriculum and methods (Wehman & Schleien, 1981)
- Leisure skills—curriculum (Wuerch & Voeltz, 1982)

ADAPTATIONS FOR LEISURE TRAINING

The majority of retarded learners have the physical capabilities to participate in most recreational activities, requiring only minimal adaptations on a temporary basis. For those retarded learners who also have severe motor problems, however, more sophisticated adaptations will generally be needed before active participation in a wide variety of activities can be realized.

Generally, the type of adaptations that will be required are specific to the activity and to the student's needs. Therefore, specific adaptations that will work in all instances are rare. Teachers working with parents, community specialists, vocational education instructors, and recreation therapists will find that problems of adapting materials can often best be solved in brainstorming sessions or by contacting other professionals around the world who may have generated ideas or devices.

For example, maintaining a tropical fish tank can be a relaxing leisure activity for some retarded learners. However, there are many details such as water temperature that must be judiciously cared for if the fish are to be healthy and thrive. A community member interested in this hobby can become a valuable resource. An individual who has studied the care of tropical fish may be of help in obtaining or designing a water thermometer with large numbers if the student has trouble reading a regular instrument. Community specialists may also provide ideas for adapting other equipment, for instance, an extension to the regulating switch of a fish tank heater so that it can be used by a person who has motor problems.

In order to provide readers with some ideas for activity and equipment adaptations for teaching leisure skills, Bigge (1982) presented a number of case studies that can be used to stimulate innovative activity modifications by teachers, parents, and others. A good example can be found in Bigge's description of adapting photography equipment to meet the needs of a severely physically handicapped learner. In this instance, the 35-millimeter camera was mounted on a tripod and sighted by a person aiding the student. The camera was operated by means of a 20-foot bulb cable release, allowing the student to activate the camera by pressing the bulb release with his thigh.

In a similar example of equipment and activity modification, Bigge (1982) discussed a program of therapeutic horsemanship developed in England during the 1960s that began with participants mounting a dummy horse to teach balance and a feeling for the riding position. The program allowed the participant to move through a series of activities, initially riding double with a trainer and eventually riding alone. Adaptive equipment included the use of special hand holds, mounting ramps, safety stirrups, and a number of other adaptations that might be required by specific need. Of course, the horses included in a program of this nature would require special training.

The process of conceptualizing and developing adaptive equipment for different activities is not an easy one. However, if the modification means that retarded individuals can participate in activities previously barred to them, then it may be well worth the effort involved.

Adapted Physical Education

More physical education teachers are specializing in adapted physical education for handicapped students (Scherrill, 1982). This increase in trained professionals means that more appropriate support services for classroom teachers are available. Physical education provided once or twice a week probably will not have a significant effect on the general health or recreational skill attainment of a retarded learner (Moon & Renzaglia, 1982). A more intensive program will require close contact between special and physical educators so that a practice in a number of skills can continue daily under the supervision of the classroom teacher.

Generally, adapted physical education involves modifying games and exercises to meet student needs. Adams (1981) identified four types of modifications that may be made: (1) reducing the size of the playing area; (2) using lighter equipment; (3) slowing down moving objects; and (4) modifying the rules. Each of these involves making specific changes (e.g., for (1), changing the boundary lines or increasing the number of players).

To this list of adaptations, teachers may wish to add another important area. Many retarded learners suffer from overweight, poor health, or a generally lethargic demeanor. Students exhibiting such problems would probably benefit from a rigorous exercise program such as jogging, swimming, weight lifting, or aerobic dancing. Classroom teachers may wish to suggest such options to their physical education counterparts. There are probably many instances where programs of

this nature may be more beneficial to the student's physical makeup and vocational potential than an adapted game.



KEY CONCEPTS



- Short-term objectives targeted for learners should be chosen to expose them to a wide variety of activities appropriate for their chronological age group.
- Once they have been taught some of the basic skills of the target activities, the students can be allowed to choose whether or not they want to continue participating.
- Behavioral technology assists retarded students in acquiring leisure skills previously thought to be beyond their capacity.
- Leisure/recreation skills should be considered an important part of the curriculum and should be scheduled for instruction in much the same fashion as academic activities.
- Learning social skills in relation to leisure/recreation activities can be important for all retarded students. Mildly retarded learners can benefit from acquiring complex social skills while engaged in highly motivating activities.
- Antecedent behavior techniques such as modeling and guiding can be highly effective when used to assist retarded learners.
- Consequences, in particular social reinforcers, are a necessary component of teaching leisure and recreation skills.
- Adaptive equipment may be necessary for some retarded learners. In these instances it may be best to contact an adaptive physical education specialist and physical therapist for advice.

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DEVELOPING CAREER AND VOCATIONAL EDUCATION PROGRAMS FOR RETARDED LEARNERS

■ The United States has been and will continue to be a work-oriented society. The perceived worth of individuals is often based on their ability to be productive members of the group (usually defined by participating in some type of remunerative employment). Society also places values on specific jobs, attaching various status levels to different occupations. For instance, some people may view sanitation workers as occupying a lower status position than teachers, regardless of the fact that in some cases sanitation workers earn more money. Consequently, two factors resulting from societal views may affect career and vocational education programs for retarded learners: (1) to enhance their worth in society, retarded individuals must work; and (2) to increase their status in society, retarded persons must work at higher status jobs.

Although society has such stringent requirements dictating a person's worth, traditionally it has done very little to ensure retarded learners a place in the nation's workforce. Federal efforts continue to provide the primary impetus for program development by attempting to involve business and industry as well as funding projects designed to improve the technology for teaching vocational skills (Ford, Dineen, & Hall, 1984). Unfortunately, these efforts have not proved to be widespread at the local level (Brolin, 1983; Langone, & Gill, 1985).

The author would like to thank Douglas Gill for his suggestions and critical analysis of this chapter.

One question that must be asked is whether or not all retarded learners must become part of the competitive workforce. This question is difficult, and it probably cannot be answered for all individuals. However, the best approach may closely relate to the principles of Public Law 94-142 dealing with the least restrictive environment. Retarded individuals should be assisted in becoming part of the competitive workforce to the fullest extent possible as allowed by the severity of their handicapping condition. Accomplishing this may require developing innovative program options such as job sharing and applying systematic educational technologies to teach the job skills.

A second question involves whether or not retarded individuals can and should be working at higher status jobs. This question again is based on individual abilities and the quality of educational programs available. Substantial evidence exists from cases documented by the National Association for Retarded Citizens that retarded individuals excel in many different and complex jobs (Payne & Patton, 1981). In some cases, professionals may need to redefine the term *employment* and identify nontraditional job possibilities instead of settling for obvious prospects such as custodial and dishwashing jobs.

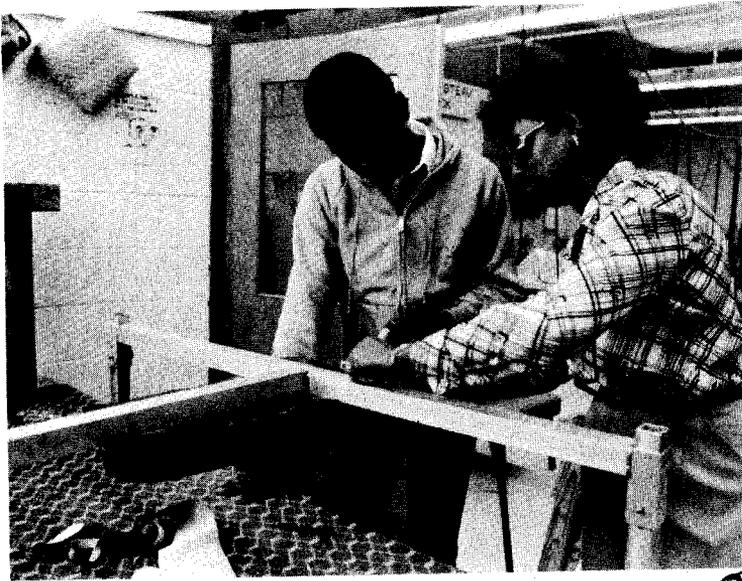
As with any worthwhile program development effort, the first step is to establish a philosophy including the principles on which the program will be based. In the past decade, professionals have spent considerable time formulating such principles. The topic of career education has been emphasized in recent years, especially in its applicability to handicapped individuals (Brody-Hasazi, Salembier, & Finck, 1983; Cook, 1983). Some of the issues involved in using career education as a foundation for retarded learners' programs are presented in the next section.

CAREER EDUCATION

Career Versus Vocational Education

Career education and vocational education are not synonymous terms. One way to conceptualize the two program areas in relationship to each other is to envision vocational education as having a narrower mission. Career education is broad in scope, involving such areas as work attitudes, career awareness, and remunerative as well as volunteer employment and is closely related to all subject areas of the curriculum (Hursh, 1982; Jessor, 1984). Vocational education deals specifically with occupational preparation. It is tied specifically to needs in the nation's workforce and is a component of a career education program (Clark, 1982). For example, one component of career education deals with a person becoming familiar with the many job opportunities in agribusiness, whereas vocational education may be concerned with teaching a student the skills necessary for becoming a feedlot hand on a large commercial cattle ranch.

Although career and vocational education are different in scope they are not independent areas of the curriculum (Mori, 1979). Career and vocational education are interwoven, each enhancing the other in all areas. One important distinction between the two curriculum areas, however, involves their emphasis on specific age levels of different learners.



A student learns upholstery skills in a vocational education class.
 (Courtesy of Glynn County Public Schools, Georgia)

Vocational education, being narrower in focus, generally involves working with secondary and postsecondary learners. On the other hand, career education is related to the students' program throughout their school career. An effective educational program for retarded students should incorporate principles of career education from preschool through the secondary program and into postsecondary programs where possible (Gillet, 1983).

What is Career Education?

During the early 1970s, the movement to elevate career education to a more prominent position in the school curriculum began to gather support (Phelps & Lutz, 1977). Marland (1971, 1974) presented a number of career education principles, including the importance of schools in preparing students for careers, the relationship between career education and all curriculum content areas, the importance of teaching work attitudes as well as exposure to career alternatives, and the need to incorporate career education into curricular options for all age levels. Since Marland's initial presentation, other professionals have expanded on the concept of career education to include not only a person's vocational role, but also family roles, citizenship roles, and, in general, the skills required for daily life in society (Brolin & Kokaska, 1979; Super, 1976). The expansion of career education continues to have a great effect on the educational curricula of all retarded learners. A narrow definition of career education focusing only on employability aspects will exclude those retarded persons for whom competitive employment may not be possible. The expanded view of career education can accommodate the needs of all

handicapped individuals regardless of their age, disability, or severity level (Cegelka, 1981).

What does career education consist of as it relates to educational program development? Basically, career education can best be viewed as having two components: a job-oriented approach closely linked with vocational education (Phelps & Lutz, 1977), and a life-centered approach closely linked to independent living skills (Brolin, 1978; Brolin & Gysbers, 1979; Kokaska & Brolin, 1985). The first component allows learners to become aware of potential employment outcomes, levels of training within each, and the duties required of individuals undertaking a particular career (Fell, Rak, & Klien, 1982). As students continue through school, career exploration activities allow them to sample experiences and tasks associated with particular types of jobs. Finally, career preparation involves the vocational education component, teaching a learner entry-level job skills in a specific area.

Job-Oriented Approach

Throughout the school curriculum, the learner can participate in awareness, exploration, and preparation activities in relation to the following 15 occupational clusters. (These 15 occupational clusters represent 20,000 job titles located in the *Dictionary of Occupational Titles, 1977*).

Agribusiness and natural resources	Hospitality and recreation
Business and office occupations	Manufacturing occupations
Communications and media	Marine science
Consumer and homemaking occupations	Marketing and distribution
Construction	Personal services
Environmental occupations	Public services
Fine arts and humanities	Transportation
Health occupations	

A thorough career education program allows students to become familiar with aspects of employment in the 15 cluster areas as well as relating academic skills and work attitudes to the requirements of specific jobs.

Life-Centered Approach

A second and equally important component of career education is the competencies required for life-centered goals relating to specific occupations. Brolin and his associates (Brolin, 1978; Brolin & Kokaska, 1979) developed a comprehensive curriculum framework that includes skills under three areas: daily living skills, personal-social skills, and occupational guidance and preparation. This approach is based on the belief that career education includes not only paid employment but also volunteer work, appropriate use of leisure time, use of community resources, and independent living skills (Hoyt, 1977). A broad approach includes all handi-

capped learners in career education programs regardless of their developmental level. Brolin's three areas of curriculum separate program options, but the components are interwoven with all other curriculum areas (e.g., academic skills, physical education). The basis for this career education approach relates to the emphasis of this text on teaching community-valid skills.

Brolin (1978), Brolin and Kokaska (1979), and Kokaska & Brolin (1985) have identified the 22 competencies in daily living, personal-social, and occupational areas that potentially can be included in a life-centered curriculum. For example, daily living skills include competencies relating to family finances, home management, caring for children, and leisure-recreation time. Personal-social skills include the application of problem solving skills, interpersonal skills, and socially responsible behaviors. Finally, occupational guidance and preparation include development of skills directed to potential employment, both paid and unpaid.

These broad competency areas need to be developed into more specific areas. Brolin (1978) has presented the framework for this competency analysis by identifying 102 subcompetencies. Interestingly, various states across the country are beginning to follow suit by developing competency-based education programs including skills that *all* learners need in order to survive in community environments. Therefore, one trend in education is to emphasize skills readily applicable to daily living.

Career education is not completed when a student leaves secondary school. Retarded students, in particular, need more time to learn skills. Professionals are becoming more interested in increasing the roles of postsecondary technical schools and community colleges in the lifelong learning process of handicapped individuals (Brolin & Elliott, 1983).

VOCATIONAL EDUCATION

Vocational education has not always been used effectively in developing programs for retarded learners. Generally, vocational programs for retarded students have consisted primarily of two options: work-study programs and sheltered workshops (Payne & Patton, 1981). These programs are based on the separation principle, clustering students together for instruction. For example, work-study programs generally train learners to perform a specific series of tasks constituting a job such as a dishwasher. Once the student is trained and employed as a dishwasher, the support system is removed, limiting possibilities for other placement options.

Placement in sheltered workshops follows the same lines, yet is more restrictive in nature. This option is based on the belief that retarded persons either cannot compete in the job market or need further training before participating in competitive employment. Unfortunately, sheltered workshops have generally become terminal placements involving the completion of low-level, repetitive tasks for very little, if any, remuneration. In either case, the programs generally have only minimal input from vocational educators. Therefore, one way to view these options is to classify them as programs emphasizing prevocational skills.

What Is Vocational Education?

Vocational education involves the teaching of entry-level job skills in any of seven major program areas: agriculture; distribution; health; home economics; office; technical; and trade-industrial education. Each of the major areas is divided into subcategories; for example, home economics can include child care, food services, and clothing. Therefore, a large number of skills across the seven program areas can potentially be taught by vocational educators. In order to narrow down the number of options presented by any one vocational program area, professionals stay in close contact with their local job market so that courses reflect the types of employment opportunities available. For instance, one part of a state may have a concentration of one particular type of industry, creating a need for specific job skills. A vocational education program should be geared to those needs.

Before the series of legislative mandates of the 1970s, mentally retarded students were almost never included in regular vocational education classes. Vocational educators who were interested in working with these learners would do so in classes usually comprised of all mildly retarded students. In 1976, the new vocational education regulations (P.L. 94-482) were written to coincide with the Education for All Handicapped Children Act (P.L. 94-142). With this legislation came increased funding designed to stimulate the development of new vocational program efforts for handicapped learners.

Interest has been stimulated among professionals for developing appropriate program options; however, the actual number of retarded learners participating in these programs appears to be minimal. Students included in vocational education classes are almost exclusively mildly retarded.

Quantity Versus Quality

The effort of teachers to increase the number of retarded learners in vocational classes is a real concern. On the other hand, an increase in the *quantity* of program options available may not affect the general employability of retarded learners over the long haul. Consequently, practitioners should consider addressing any problems that adversely affect the *quality* of program development. Identifying a common denominator among quality programs in the area of vocational education for retarded learners is the first task. This task requires teachers from special and vocational education to cooperatively plan and implement effective program options. Albright and Preskill (1981) discovered that of the sampled vocational educators who had handicapped students in their classes, fewer than half were ever consulted during the IEP development process. Furthermore, once handicapped students were enrolled in vocational education, only 13% of the instructors sampled had contact with other practitioners (e.g., special educators) who could provide instructional support.

A primary concern of special education teachers should be to develop effective working relationships with vocational educators. These "working relationships" go beyond cooperative agreements among special education, vocational

education, and vocational rehabilitation specialists and the surface roles they define. Teachers can informally implement, on a daily basis, strategies that result in a reciprocal rather than a cooperative relationship. This way, each teacher in the team benefits from the skills of the other. Teacher training programs can help professionals gain these competencies by providing activities that include representations from special education, vocational education, and rehabilitation (Clark, 1984).



KEY CONCEPTS



Teachers should initially be concerned with three factors currently existing that may have an adverse effect on the ultimate employability of retarded learners:

1. Very little, if any, attention is being given to career related or specific prevocational skills prior to secondary programs.
2. Only a small percentage of vocational educators are included in the IEP development process.
3. The percentage of vocationally related objectives on IEPs is, at best, minimal (Pyecha, 1979). These factors should provide the special and vocational educator team with a jumping-off point for developing a sound philosophical program base.

- Career education and vocational education are separate program components. Vocational education is a part of career education, and it attempts to teach entry-level job skills in a variety of employment areas.
- Career education is broader in scope, including awareness and knowledge of many different employment areas and learning good work habits. This area has been expanded in recent years to include for handicapped individuals their roles as family members, individuals, and citizens.
- Legislative efforts have mandated increased enrollment of handicapped students in vocational education classes.
- An increase in the number of high quality vocational education programs for retarded learners will require a closer working relationship between special and vocational educators.

CAREER AND VOCATIONAL PROGRAMS: THE IEP

Unlike some other areas of the curriculum, developing vocationally related programs requires from the beginning, close contact among teachers from different disciplines. Before a community needs assessment can be implemented, a program philosophy for a given learner must be agreed upon by those involved in its design.

Therefore, two additional considerations must be addressed prior to beginning steps one and two of the curriculum development process.

One question teachers should answer concerns when to begin the cooperative or team effort (Gill & Langone, 1982). In practice, vocational educators included in the IEP development process may not formally meet their special education counterparts until the meeting begins. Professionals who begin working together *prior* to the IEP staffing have a better chance to develop high quality program options. Professionals attempting to design a program in a time space of a 1-hour meeting may develop inappropriate program goals such as "The student will participate in vocational home economics."

The special/vocational educator team must meet informally prior to the IEP staffing in order to complete tasks vital to effective program development. This relationship continues throughout the development and implementation stages. The emphasis, however, should be on the concept of laying the groundwork *before* a formal staffing is convened. The tasks targeted for completion by the dual educator team are activities relating to identifying program goals, including establishing a program philosophy, identifying potential employment outcomes, and assessing present levels of vocational performance.

Establishing a Program Philosophy

An important step for special and vocational educators is to establish a sound philosophical base on which to build the learner's program (IEP). The importance of identifying ecologically valid reasons for teaching skills to retarded learners was presented in Chapter Three. That discussion is particularly important when considering both career and vocational education program goals.

For example, some professionals may feel the role of vocational education is to develop "craftsmen," those who are proficient at high-skill-level employment (e.g., plumbers). This philosophy may create negative attitudes toward enrolling many retarded learners in these programs since the prospect of their obtaining all the high-level skills necessary to be craftsmen is low. Similarly, if elementary-level special educators feel that their students are "too young" to participate in career education activities (e.g., awareness and prevocational skills), a major stumbling block is placed in the path of later program development.

At the initial level of program development, the following questions must be answered: "Why should a given student be enrolled in *x* program? Or, why does a given student need to learn these targeted skills?" To answer these questions both special and vocational educators must work together to identify what skills are most appropriate based on three general stages: (1) occupational readiness, the development of those skills that apply to any occupation; (2) occupational preparation, the development of those skills that apply to specific occupations; and (3) occupational enhancement, the development of those skills that apply to an individual job site (Oetting & Miller, 1977). There are other theories of adjustment to employment; however, the Oetting and Miller steps are concise and easily applicable to retarded learners. These three guidelines assist teachers in matching the needs

of the individual retarded student to some component within stage one and possibly into components of either stage two or stage three, depending on the learner's strengths or weaknesses.

The first stage, occupational readiness, corresponds very closely to the principles of career education, including the curricular areas of independent living skills, interpersonal skills, leisure/recreation skills, career awareness, career exploration, and prevocational skills including areas such as work attitudes. Any retarded learner, regardless of age or severity level, can be included at some stage of a life-centered career education program. When students' skills have reached a level of proficiency identified by both special and vocational educators, it is possible that the philosophical base of the program will stress either occupational preparation or enhancement.

At this point, it may be helpful for teachers to view how the expertise of each professional comes into play when developing a program philosophy for specific learners. When targeting career-education-related objectives, the primary responsibility for program implementation will be in the hands of the special educator. Yet, the technical knowledge of the vocational educator will be vital on a consulting basis. For example, the vocational educator can help to define the types of skills considered as readiness for certain vocational options and under what conditions the skills will be required, while the special educator has the skills required for assessment, instructional, and behavioral intervention with retarded learners. Combining the skills and expertise of both educators will provide a broader base for developing the program philosophy.



KEY CONCEPTS



- The areas of occupational readiness, preparation, and enhancement are closely related. For many retarded learners they cannot be used as prerequisites for each other. For example, a retarded learner who has not mastered all the readiness skills can often be placed in a vocational preparation option, learning the readiness skills in conjunction with the actual job skills.
- Horner and Bellamy (1978) cited a case in point where learners having difficulty in obtaining certain prevocational skills could benefit from job training in community work sites.

Steps One and Two: The Community Needs Assessment (CNA)

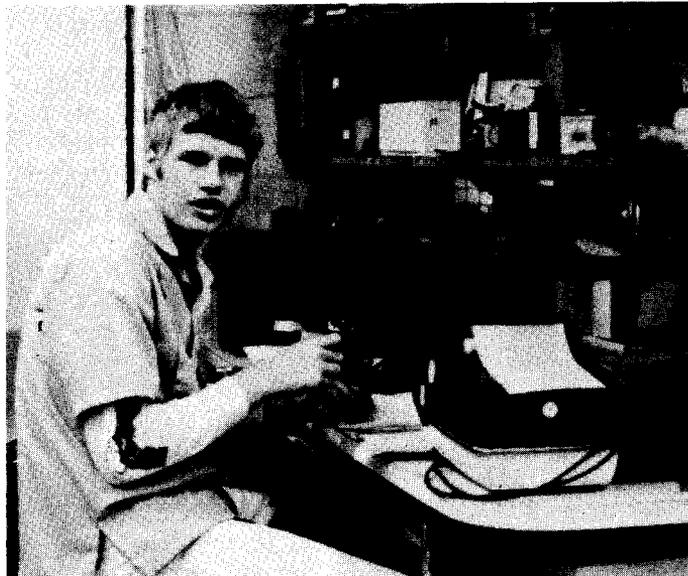
One of the more important tasks during the pre-IEP meetings is to analyze the employment needs of the community and match those needs to the program goals of a specific student. A major barrier to identifying appropriate employment possibilities for retarded learners may be an overreliance on traditional jobs (Bellamy, Sheenan, Horner, & Boles, 1980). Most special education teachers may be unaware of the wide range of employment possibilities in their own communities

or may not have a working knowledge of what skills are required to be successful at a particular job (Alper, 1981). At the same time, vocational educators may view retarded students as being unable to learn the skills necessary for becoming a skilled laborer. Working as a team can provide insight in two ways: (1) the special educator can provide the knowledge and skills to demonstrate that retarded learners can accomplish complex tasks previously thought impossible, and (2) the vocational educator can provide knowledge of potential employment outcomes as well as contacts in the community for becoming familiar with the skills involved in each job. (At this level the vocational rehabilitation specialist can also be a valuable asset to the team in a consulting capacity.)

A job search should not be limited in scope. Many alternatives should be discussed, including those similar to the ones developed by Brown and his associates (1979a, 1979b). For example, job sharing is one alternative in which two handicapped individuals with complementary disabilities work together to complete one job.

Identifying jobs that currently do not exist should also be a priority. Brown (1981) presented an example of identifying new jobs in a hospital setting. In this instance, the job of a hospital pharmacist was analyzed, and it was found that the pharmacist spent a disproportionate amount of the day performing routine tasks such as unpacking medical items—a decidedly inefficient job for a highly trained professional. Accordingly, a severely handicapped individual with multiple disabilities was trained to perform the unpacking task, eventually resulting in a part-time paid position for the student and increased efficiency for the pharmacist.

There are a number of other alternatives for employment opportunities for



Learning vocational skills in a community setting such as the hospital maintenance room. . . (Courtesy of Glynn County Public Schools, Georgia)



... or hospital dietary section can result in a paid position.
(Courtesy of Glynn County Public Schools, Georgia)

retarded learners that can be considered by the dual educator team. One viable alternative may be to identify nonpaid positions such as community volunteers. Volunteering can benefit retarded learners in a number of ways. First, individuals who traditionally have spent their lives engaged in nonproductive activities (e.g., self-stimulation, inappropriate social behaviors) can have the opportunity to contribute to the needs of others. Second, volunteer positions allow for vocational training in a realistic community environment or for generalizing skills learned in a school program. Finally, a program of this nature helps demonstrate to other community members the skills and hidden potential of these students.



IDEA FILE



Special and vocational educators need to become familiar with the increasingly prevalent technological advancements designed to assist handicapped persons in performing job tasks (Brolin & D'Alonzo, 1979). Cegelka (1981) has provided examples of some of the recent technology such as the following:

1. Light sensors to assist blind garment-snap machine operators to engage the machine at certain points in the assembly process.
2. Electronic aids that can be activated by sound or by using head wands, allowing access to devices such as tape recorders, cameras, and telephones, and opening the door to adapting industrial machines controlled by switches and mechanisms other than those traditionally available.

3. Computer systems that can be used to match a person's abilities to an unlimited number of potential employment opportunities. In addition, the potential for using computers to assist handicapped persons in their daily activities on the job has yet to be fully explored (Flanagan, 1984; Nave, Browning, & Carter, 1983).

At this level the best method for exploring the various technological advances is to contact various vocational rehabilitation specialists. The most up-to-date information will probably be available from state-level personnel; however, in many cases the local rehabilitation counselor will have this knowledge and can assist the dual educator team on a consulting basis.

Actual potential employment outcomes can be gathered during the community needs assessment. The CNA can be designed to gather information on the types of jobs available and to sample opinions of community members concerning their needs (see Table 13.1). In addition, parent preferences concerning their students' occupational roles and, whenever possible, the opinion of students in regard to their future should be gathered.

Job Analyses

The teachers' first task should be to conduct a series of job analyses. These analyses involve becoming familiar with various workers and the daily routine their jobs

TABLE 13.1 *Community Needs Assessment Form Listing Potential Employment Outcomes**

<i>Potential Employment Outcome</i>	<i>Subenvironment</i>	<i>Employer</i>
Backing crabs	Crab room	Barns Crab Factory
Custodian	Bathrooms Offices	Barns Crab Factory
Heading shrimp	Shrimp room	Barns Crab Factory
Housekeeping	Patient rooms Halls	Smith's Nursing Home
Housekeeping'	Rooms Halls Lobby	Ye Olde Motel
Food wrapper	Dietary	Community General Hospital
Food server		
Line worker 1	Section A	Commercial Industries
Tire mounting & balance person		Tire World
Feedlot hand	Barn	Miller's Farm

* Items from the Glynn County, Georgia, School System

entail. The person conducting the survey observes the workers, recording what they do. One quick measure of a community's employment needs can be obtained from state labor department statistics; however, additional factors must be considered such as new jobs or nontraditional employment not included in such reports. The goal is to identify what potential employment opportunities exist under each of the 15 occupational clusters. The potential opportunities are many, ranging from jobs that involve entry-level unskilled qualifications to professional requirements.

The next category of information concerns the background of the workers employed in the identified occupations. Information at this level should include the type of preparation a worker needs for a job and any changes in preparation requirements from employer to employer. Information such as the locations of employment possibilities, transportation requirements, and the type of supervision a worker receives on the job is also desirable (see Table 13.2).

Finally, a complete skill sequence of the job itself is an important requirement. This task is accomplished by recording each skill exhibited by the worker and classifying the skills according to whether they are motor or academic. An activity of this nature allows teachers to visualize how similar skills can be included in a school curriculum. This phase of the process helps identify portions of a person's job sequence that can be completed by a handicapped learner or whether the job can be completed by two handicapped individuals working together (see Table 13.3).

Using Volunteers or Aides to Gather Data

Although the benefits of gathering community assessment information are apparent, the time required to complete the process can become a burden. Teachers have

TABLE 13.2 *Sample Task Sequence of a Job Including Additional Information and Community Resources**

Environment: Barns Crab Factory

Subenvironment: Crab room

Job: Crabber

Community Resource: Joe Barns (Supervisor)

Special Considerations: Must have transportation to and from work. No bus system available; carpool required.

No special equipment needed.

1. Obtain one crab.
 2. Remove back and place in "back" basket.
 3. Remove legs and place in "leg" basket.
 4. Place body in "body" basket.
 5. Repeat process.
-

* From Glynn County, Georgia, School System

TABLE 13.3 *Sample Task Sequence of a Job Including Additional Information and Community Resources**

Environment: Smith's Nursing Home

Subenvironment: Patient's room

Job: Housekeeping

Community Resource: Ms. Rebecca Melrose

Special Considerations: Change bed when patient is out of room.

1. Take fitted sheet from stack.
 2. Unfold sheet on bed.
 3. Grasp bottom of sheet with both hands. Pull bottom of sheet to bottom of mattress.
 4. Place right corner of sheet over corner of mattress.
 5. Place left corner of sheet over corner of mattress.
 6. Place top right corner of sheet over corner of mattress.
 7. Place left corner of sheet over corner of mattress.
 8. Spread out wrinkles.
 9. Take top sheet from bed.
 10. Unfold on bed.
 11. Spread over bed.
 12. Grasp bottom of sheet (Name) hem and pull to bottom of mattress.
 13. Center, straighten, and smooth sheet.
 14. Grasp top of sheet to pull to top of mattress.
 15. Center, straighten, and smooth sheet.
 16. Tuck bottom of sheet under bottom of mattress.
 17. Tuck bottom right corner of sheet under corner of bed.
 18. Tuck bottom left corner of sheet under corner of bed.
 19. Take spread from chair.
 20. Unfold spread.
 21. Grasp bottom of spread with both hands and pull to bottom.
 22. Center and smooth spread.
 23. Pull top spread to top of bed and smooth.
 24. Pull top of spread back to twice width of pillow.
 25. Take pillow from chair.
 26. Place pillow on bed lengthwise in front of body.
Hold one edge of open pillowcase.
 27. Grasp in each hand. Pull pillowcase over bottom of pillow about 4 inches.
 28. Pull pillow up against chest, holding it with chin.
 29. Shake pillow down into case.
 30. Lay pillow at top of bed.
 31. Fold spread over pillow.
 32. Smooth out wrinkles ✓
-

* From Glynn County, Georgia, School System

the option to gather this information using other resources. One possibility is to use volunteers such as high school students or members of service clubs. A cadre of community assessors can be trained with only a minimum investment of time. Aides and paraprofessionals can also be taught to identify potential employment outcomes and become adept at gathering information.

In most cases, teachers need to become more familiar with what is available in the community because some firsthand observation is necessary for the individual providing direct instruction to students and coordinating the program design. Therefore, teachers and administrators should strive to arrange schedules that will free the dual educator team to explore these areas.



IDEA FILE



Approaching employers in the community requires careful planning, combining the talents of many individuals within the school system. In an ongoing project with the Glynn County School System, Brunswick, Georgia, the author found that the best results were obtained when a team representing the school district approached employees. This team can include a variety of members, but generally is best comprised of an administrator and the teachers who will implement the program.

There are no set rules for the size of this team; however, between two and four members should be adequate. The administrator must have the power to commit the necessary resources (e.g., transportation) and be able to discuss issues such as liability. Teachers can provide information such as the skills the students can perform and the techniques that will be used to teach new skills.

Liability is the main issue that people such as administrators in schools and community members will always raise. Again, there is no specific answer as to how to handle this issue. The approach taken in the Glynn County Schools and one that has been taken elsewhere in the nation is to treat liability for these programs as it is treated in other off-campus school programs such as away football games and cooperative vocational work-study programs. Essentially, the school district is always responsible for the students in off-campus activities occurring during the school day. The community-based instructional programs highlighted throughout this text are viewed as moving the classroom from the school building to the community, thus keeping the liability for the students in the hands of the school district.

In some instances, teachers may need to use their own vehicles to transport students to the site where instruction will occur. One way to handle this is that liability is first covered by the teachers' insurance and anything not covered by personal policies is handled by the school district's policy. These issues should be discussed and settled prior to approaching community employers.

Advisory groups can also be a source of information. Most vocational education programs presently have community advisory groups comprised of local employers. Special educators can make use of these resources by attending these meetings with their vocational education counterparts.

For example, a CNA may identify at least 10 potential employment outcomes related to vocational agriculture in a rural location (Langone & Gill, 1984).

For each of the 10 employment possibilities, information will have been gathered pertaining to specific job skills, training needs, pay plus benefits, transportation required, and any other considerations necessary to complete the job analysis. At this point the special educator can begin to relate the data to existing curricular components or components that need to be developed. At the same time, the vocational educator learns more by discussing with the special education teacher the real capabilities of retarded learners in relation to specific jobs. In either case, the goal at this level is to identify jobs and resources available in the community so that the eventual objectives included in the learner's IEP are valid and based on realistic options.

Step Three: Identifying Potential Annual Goals

Identifying potential annual goals in vocational areas differs somewhat from identifying goals for academic skill. The annual goals teachers choose relate specifically to the potential employment outcomes or job training sites identified in each community. Figure 13.1 includes a list of potential job sites that may be appropriate for students ranging from mildly to severely retarded. From this list and other sources generated by teachers in their own geographic area, annual goals such as the following can be written:

1. Completes all the tasks required for a dietary aide in a nursing home.
2. Completes all the tasks required of a stock person at a local pharmacy.

Many mildly retarded learners and some moderately retarded learners may participate in vocational education classes. Special educators can meet with voca-

- | | |
|-----------------------|--|
| 1. Hospitals | 10. Pizza restaurants |
| 2. Churches | 11. City, county, and state government buildings |
| 3. Community colleges | 12. Various small businesses |
| 4. Technical schools | 13. Nursing homes |
| 5. Grocery stores | 14. Private homes of homebound elderly |
| 6. Department stores | 15. Private apartments |
| 7. Pharmacies | |
| 8. Banks | |
| 9. Various industries | |

■ FIGURE 13.1

Examples of Nonpaid Work Training Sites in a Local Community

tional education teachers and outline some potential annual goals such as the following (Langone & Gill, 1984):

1. Reads major technical vocabulary words presented in the building trades course.
2. Mixes mortar.
3. Measures to the ½ inch.
4. Completes all the tasks required of a feed lot hand in the agricultural education course.

Step Four: Translating Goals into Potential Short-Term Objectives

Translating goals into potential short-term objectives involves describing in measurable terms what the student is expected to accomplish. This process has been described previously, so only one example is presented here.

Outcome: The student will complete the five tasks comprising the job description of a feedlot hand.

Context: At the agricultural class work site.

Criteria: For 5 consecutive days, based on instructor's criteria located on the skill sequences for each task.

Step Five: Assessing Student Entry Behaviors

The strategy at the assessment level is to identify a student's current vocational performance. Information concerning a retarded learner's strengths and weaknesses must be gathered prior to the initial IEP staffing. These data relate to vocational goals and objectives. One of the first tasks at the assessment level is for the special educator to demonstrate how target skills in a vocational sequence might be learned without academic proficiency. Here the information from the community analysis is useful because of its documentation of the extent to which academic skills are needed by specific workers. Jobs with high academic qualifications may be discounted if adaptations cannot be made.

Assessing the learner's present level of vocational performance relates specifically to the kinds of skills needed to achieve a target job. Preoccupation with specific academic skills only serves to exclude the majority of retarded learners from vocational program options. Instead, the primary goal of the dual educator team is to gather information about students' strengths and weaknesses in order to adapt methods and materials designed to teach designated vocational skills.

Standardized Tests

Standardized vocational assessment batteries generally assess both aptitude and interest. Aptitude tests are used to predict how a person will perform at certain

jobs, often resulting in a prediction of success or failure. Vocational interest inventories are designed to sample an individual's preferences for various occupational options over others. There is a place in the overall scheme for standardized instruments such as these; however, at the stages of occupational readiness and preparation they may not provide the best information (Langone & Gill, 1986b).

There are a number of reasons why standardized vocational measures may not be the most appropriate way to measure present level of vocational performance. They often include high reading requirements and a bias toward males and people from a middle socioeconomic background (Brolin, 1976; Payne & Patton, 1981). Equally important are the facts that retarded learners typically generalize skills poorly and have, at best, a limited experiential background.

Since retarded learners have a great deal of difficulty generalizing skills, the results of tests designed to predict success on a job site may not be useful. The dual educator team is concerned with a student's performance in a given vocational class; therefore, the assessment system should be developed and implemented in that setting.

Similarly, retarded learners often have limited experiences due to the sheltered lives many of them lead. Results from interest inventories will probably provide only limited information. The learners may answer questions in relation to the way they view popular occupations, usually those seen on television. Questions about a job they have not come in contact with may not yield a response. Accordingly, when designing their assessment options the special and vocational educator team would attempt to arrange observations of the learners in different vocational settings, noting how they react to different jobs.

Techniques for Assessing Vocational Performances

Assessment activities yielding more useful information involve direct measurement of operationally defined prevocational behaviors, information from prior vocational or occupational experiences, results of exploration activities in and among various regular vocational programs, and vocational education performance samples.

First, a list of prevocational skills agreed upon by the dual educator team should be developed and converted into performance objectives. For example, the teachers may decide that a student needs to be able to follow directions, locate basic tools upon request, have the manual dexterity to assemble and disassemble threaded machine parts, and meet minimum requirements in proper dressing and grooming.

The technical expertise (knowledge concerning the specific skills) is supplied by the vocational teacher, whereas the assessment techniques (direct measurement of learner behaviors) are supplied by the special educator. Take, for example, the skills involved in locating basic tools. The vocational teacher can set up the situation by identifying the tools important for the student to be familiar with. At the same time, the special educator can design a simple frequency count tally system and charting mechanism used to monitor student progress on the task.

Although this is a simple example, it should provide the reader with an idea of how a cooperative assessment may work. Assessment activities can range from simple ones such as the example just given to complicated activities involving the use of machinery or a detailed skill sequence. In any case, the expertise of more than one teacher is needed before the data gathered will be useful.

Whenever possible, a good rule of thumb is to collect multiple samples of a learner's behavior. This process can be accomplished by combining skills to form a sequence and then assessing the completion of the sequence by the student in the vocational education class, the special education program, and the community. For example, the dual educator team may decide that an important prevocational behavior is the ability of students to compare their work to a preestablished criterion (quality control). In this case, work activities can be structured in both special and vocational classes as well as in community sites, with teachers observing the extent to which the student can accomplish these skills under a variety of conditions.



KEY CONCEPTS



- The community needs assessment assists teachers in locating resources in the community that can take three forms: people to provide technical expertise, locations for job sites, and volunteers to help teach students.
- Special educators, vocational educators, and rehabilitation specialists work together to identify community resources.
- Locating traditional jobs is only one aspect of CNA. Teachers must look for components of existing jobs that retarded students can learn to perform. This approach, developed by Brown (1981), is similar to his concept of partial participation. Looking for the components of a job that tend to make a worker less than efficient and then teaching a retarded learner to complete those components can be a good selling point when approaching employers.
- Volunteer positions are an excellent vehicle for training retarded learners in vocationally relevant skills.
- Community volunteers such as regular education high school students can be used to help gather CNA information.
- Attending meetings of advisory committees used by vocational educators is one method of meeting employers.
- Potential annual goals and short-term objectives are developed from the information gathered during the CNA.
- Standardized vocational assessment tests are designed to obtain survey-level data. They can provide a general assessment of a student's interests and aptitudes.
- These assessment devices may not provide the best information for retarded learners because of the limited experience these students have and the difficulty they have in generalizing skills.
- Task analysis of the target vocational objective may be the best vehicle for assessing the skills of retarded learners.

PROGRAM IMPLEMENTATION

Identifying and Analyzing Short-Term Objectives

Once the initial groundwork is completed by the dual educator team, a clear picture will have developed of students' needs (including strengths and weaknesses) in relation to available employment options (either competitive or non-competitive). At this stage the IEP committee will be ready to convene in order to study the information and make judgments concerning which areas to emphasize in setting objectives and what support services will be required. For example, the special and vocational educator may have identified a number of potential employment outcomes existing in vocational agriculture in their location. After delineating the crucial prevocational skills generic to these jobs and assessing the student's skill performance, the teachers may submit the following annual goal to the IEP committee for approval: "The student will be able to meet performance criteria for entry-level job skills in one or more of the potential employment options in vocational agriculture (listed from the community needs assessment)."

The committee has the option to choose, based on assessment data including parent and student preferences, which of the potential employment outcomes is applicable or advantageous for the retarded learner to pursue. The annual goal might then read, "The student will meet the minimum criteria needed to perform the job of feedlot hand" (Langone & Gill, 1984).

The next phase of the IEP meeting involves developing or approving short-term objectives. These short-term or behavioral objectives are usually available if the dual educator team has analyzed the program goals. Continuing with the feedlot hand example, the student will have to learn such skills as tending cattle, feeding cattle, maintaining facilities/equipment, keeping necessary records, and producing feed. The IEP committee can take these skill areas and convert them into performance objectives.

Developing Instructional Strategies

The next task involves joining the efforts of both teachers to modify the curriculum. This means that the relationship between the teachers must continue beyond the IEP development stage and throughout the implementation stage. Therefore, the teachers should consider developing daily implementation plans that involve teaching specific skills in one class and enhancing the same skills in the other class.

In the feedlot hand example, the learner needs a number of skills to complete this job, including filling feed troughs with mechanical equipment, providing proper amount and quality of water, and mixing feeds plus additives. Each of these subskills can be analyzed into smaller chunks of instruction. For example, mixing minerals entails locating the appropriate items, determining correct amounts of each mineral, placing measured minerals in a central container, mixing the minerals, and placing the minerals in the location available to the cattle.

Using this system of parallel teaching (Langone & Gill, 1985), one teacher



Special education and vocational education teachers can work together to make parallel teaching an effective instructional strategy. (Courtesy of Glynn County Public Schools, Georgia)

instructs the learner in areas complementing the skills concurrently being taught by the other teacher. Therefore, if the vocational educator is teaching a retarded learner to mix minerals, the special educator will be teaching the same learner a complementary skill such as mixing various amounts of liquids. Similarly, if the special educator is teaching the use of a calculator for computation skills, the vocational educator can concurrently be teaching the application of calculators to problems within the target vocational sequence.

Special educators should be aware of some specific strategies or activities that may facilitate an effective reciprocal relationship with vocational educators. The following suggestions are designed to enhance the development of appropriate career and/or vocational programs for retarded learners.

1. Getting to know as many vocational educators in the school as possible is an important first step. Demonstrating a genuine interest in their programs, including the content of their courses and the types of employment possibilities for which they train their students, can facilitate this relationship.
2. Requesting release time during the school day to observe vocational programs provides a better indication of the types of behaviors retarded learners will require in order to participate in those programs.
3. Asking vocational educators to visit special education classes to observe retarded learners in that setting helps them get a better perspective of the skills of these students. This activity, if carefully structured by the special educator, can also act to desensitize vocational teachers to various handicapping conditions. This op-

portunity allows the vocational educator to observe activities and suggest other curriculum exercises reflecting prevocational skills.

4. Requesting vocational educators' assistance in conducting an intensive community needs assessment results in better information. Their role can either be active (making community visits with the special educator) or more of a consulting nature (suggestions concerning whom to contact in the community). In any case, working with a number of vocational educators is necessary for gathering data in a number of occupational areas.
5. Mobilizing classroom aides and volunteers can help in conducting community job analyses. These individuals can obtain information about potential employment outcomes and help translate these skills for classroom instruction.
6. Being more aware of how workers conduct themselves in the performance of their jobs assists in developing curricula. For example, when eating in a restaurant or attending a movie, jotting down the kinds of skills employees in these types of establishments exhibit helps increase awareness.
7. Assisting vocational educators in modifying their curricula may first involve posing clarification questions. For instance, when developing behavioral objectives asking for specifics such as the type of equipment needed to complete a task and the conditions under which the student will perform certain skills is an example. Also, it is important to assist vocational educators in requesting the most appropriate information about a learner. A reading score on a diagnostic reading test may not be an appropriate criterion for success; however, the ability to read technical vocabulary may be a better indicator of success in a vocational program (Gardner & Kurtz, 1979).
8. Options for overcoming scheduling constraints have to be developed in order for the program to be successful. Career and/or vocational program options, to be effective, must be designed to meet the needs of the student. Therefore, innovative program options such as allowing students to spend time in more than one vocational program, using flexible schedules, will require careful planning.
9. Keeping close ties with vocational rehabilitation specialists will help teachers maintain awareness of technological breakthroughs that may be of benefit in the vocational training of retarded learners and in finding much-needed resources.

Strategies for Teaching Vocational Skills to the Severely Handicapped

Vocational programs for the handicapped should incorporate options for all learners, regardless of severity level. Earlier in this chapter the topic of identifying nontraditional employment possibilities was described. Nontraditional jobs involve options such as job sharing and identifying new jobs that usually are a subcomponent of an existing job (Brown, et al., 1979a, 1979b). During the initial stages of program design for this population, the hardest task is to convince other professionals that these and other suggestions are viable. The more severe the handicapping condition, the more the responsibility for program implementation falls to the special educator.



IDEA FILE



Pairing retarded learners with elderly people who need help to survive in their own homes can be an excellent way to teach vocationally related and life skills while performing a needed service. A program in the Glynn County Schools, Brunswick, Georgia, was developed through the efforts of the author, the school district personnel, and eight social service agencies identifying homebound elderly who desperately need assistance with tasks such as yard and housework, cooking simple meals, home maintenance, and paying bills. Teachers from the school district take small teams of retarded learners to the homes of these individuals, train them in the identified tasks, and maintain the tasks during the school year.

A program of this nature has many benefits such as the following:

1. Students are learning meaningful skills that they will eventually need to become as independent as possible within the community.
2. Generalization of skills is facilitated because students are coming in contact with a variety of materials and equipment in many settings (Langone & Westling, 1979).
3. Many related skills can be taught in conjunction with the home management skills. For example, students can also be taught community mobility and functional academic skills while they participate in the program.
4. Community-valid skills are being taught in realistic environments.
5. Public relations for such an effort can open other doors in the community, potentially resulting in additional work sites in business and industry.
6. Retarded students are also learning to help others less fortunate than themselves and to improve their social skills.

Beyond this program, additional efforts are beginning in nursing homes and the local hospital.

The Role of Vocational Specialists

Until now, vocational specialists have not played an active part in developing and implementing prevocational or vocational program options for severely retarded learners. Some of these professionals may believe they do not have the expertise to assist severely retarded students in realizing occupationally related goals. However, vocational professionals can provide special educators with vital consulting assistance in a number of areas such as identifying potential employment outcomes, targeting good work habits and other prevocational skills, locating training sites and jobs, becoming familiar with technological advances and adaptive equipment, and developing valid vocationally related activities. Vocational personnel assist special educators by keeping vocational programs for severely retarded learners in close touch with daily community activities. Vocational specialists

should be consulted in the areas mentioned here before the program has been developed and during the implementation stages.

The State of the Art

Initially, one of the most formidable barriers to placing severely retarded persons in community settings is ironically a placement option originally designed to assist in that very task.

Sheltered workshops were designed to provide handicapped persons a setting where they could be evaluated and trained in work adjustment as well as vocational skills (Flexer & Martin, 1978). They were designed to provide remunerative work while preparing the client for the eventual transfer to a community job site. Another placement option, called *work activity centers*, is designed for the most severely handicapped clients and provides activities such as leisure/recreation skills and prevocational activities that do not necessarily result in remuneration (Flexer & Martin, 1978).

Unfortunately, in many cases sheltered workshops and work activity centers have become a terminal placement for mentally retarded clients. These options have not often proved to be monetarily efficient operations, thus they provide substandard wages for the workers (Pomerantz & Marholin, 1977). In the final analysis, sheltered work sites may serve mainly to occupy a retarded person's time, often with contracts and activities that have little relationship to realistic vocational employment options. In fact, of the contracts obtained by workshops in a majority of instances, the work is slow-moving and extremely repetitive (Greenleigh Associates, 1975).

Some workshops are run like a business, with the goal of becoming a profitmaking endeavor. These workshops have been successful in these pursuits by using the expertise of volunteer businessmen and women and industrial experts (Bellamy, Inman, & Horner, 1977). There are social problems (e.g., high unemployment rates) that can impede progress in this area. Nevertheless, workshop personnel can overcome these constraints, looking toward the technological advances and investing in equipment to participate in moneymaking products (Flexer & Martin, 1978).

The concept of "sheltered," not the workshops themselves, should be abandoned. Clients can benefit most from programs that allow some training in the natural environment. Programs such as workstations in industry should be implemented on a broader scale. Programs such as these allow for the client to be trained on the actual work site in an industrial placement so that instead of the contract being brought to the client, the client is brought to the contract. In areas where industry is not prevalent, other community training sites can be found in retail business, private homes, and volunteer placements. For most clients, parts of the day should be spent away from the workshop or activity center, learning skills and generalizing them to the natural environment.

The Supported Work Model

Teaching moderately and severely retarded learners vocational skills in realistic community placements appears to be a highly effective and cost beneficial approach (Hill & Wehman, 1983; Wehman, et al., 1982). The approach that appears to provide the most success is called the *supported work model* (Kraus & MacEachron, 1982). This model actually contains all the approaches discussed in this chapter including all the aspects of the community needs assessment.

In many supported work model programs, teachers accompany small groups of learners to the job sites and teach the target skills in the community setting. Less attention is given to students' obtaining all prevocational skills prior to moving into the community. Instead, teachers take the responsibility for teaching the prevocational and vocational skills simultaneously.

For example, during the CNA four job training sites (nonpaid or volunteer employment) might have been identified and secured at the local hospital. The teacher might take a group of four moderately and severely retarded students to the hospital 3 days a week for 2 hours each day, training them in the skills required to complete those jobs. As these students gradually learn the necessary skills required of their jobs, the teacher can gradually fade her supervision, instructing hospital personnel in how to monitor the students' behaviors.

Supported work options have three main advantages over simulated vocational training and sheltered workshops. First, students are trained in community environments using realistic materials where professionals project that they will ultimately work. Second, employers and the community at large have the opportunity to come in contact with retarded learners and realize their potential as productive citizens. This factor may result in competitive employment opportunities becoming available for these students.

Third, inappropriate social and adaptive behaviors are often controlled more effectively in natural environments (Brown, 1981). More naturally reinforcing contingencies exist in the community, and careful structuring of the program allows teachers to manipulate these contingencies to manage behavior. Also, more appropriate social models are available in the community, whereas one of the major disadvantage of sheltered workshops is the abundance of inappropriate behaviors retarded individuals have to imitate.

Strategies for Instruction

Vocational options for severely retarded learners can improve if teachers apply proven techniques for adequately instructing these learners in occupational skills. Severely retarded persons can learn complex vocationally related tasks, a fact proven in a number of research studies (e.g., Bellamy, Peterson, & Close, 1975; Crosson, 1969; Gold, 1972, and 1976). These programs appear to be successful because the strategies employed in training complex vocationally related tasks revolve around operant procedures and direct measurement techniques.



IDEA FILE



The three resources listed below are a sample of the many resources available to teachers.

Methods of vocational preparation (Brolin, 1982)

Methods for vocational preparation (Lynch, Kiernan, & Stark, 1982)

Methods for vocational preparation (Weisgerber, Dahl & Appleby, 1981)

Techniques for Developing Vocational Programs

Behavioral principles underlying techniques such as the use of discriminative stimuli (S^D), chaining, and fading were discussed in Chapter Six. Instructional procedures such as task analysis, charting of learner behavior, and programming for generalization have also been discussed in relation to teaching other curricular areas. The trick is to match these instructional strategies and techniques with appropriate vocational content and materials (Rusch & Mithaug, 1980; Wehman, 1980).

Using the procedures of curriculum design, assessment, and instructional strategies previously discussed, teachers should be able to match appropriate techniques to the needs of any given learner. At the same time, however, there are certain unique situations that arise when developing vocationally related programs for retarded learners. The following are suggestions for developing program options for such situations. Some were presented earlier in this chapter; however they are important enough to highlight again. The other suggestions are products of research efforts and classroom-based ideas that may assist teachers in dealing with some basic concerns.

1. Teachers should explore the total range of vocationally related services in the areas where students reside. Visiting sheltered workshops, work activity centers, and rehabilitation evaluation services will provide a clear picture of what lies ahead for the learner while allowing the teacher to establish a network with other professionals.
2. It is important to work closely with professionals from local workshops and rehabilitation agencies. The relationship, once established, may allow teachers to provide input into the daily operation of these program options.
3. A major goal is to assist parents of severely retarded learners in becoming aware of the many options available to their children in the community. Some parents will, when given alternatives, push for options that are more appropriate than the traditional ones available.
4. Keeping in close contact with community resources is a key task. Gold and Pomerantz (1978) suggested that professionals must develop a close working relationship with business and industry. They also suggested that when ap-

proaching members of the business community teachers should use an approach other than the traditional "hire the handicapped because they need our help." Rather, these people should be approached in terms of profit-making or efficiency, pointing out the excellent safety and production record of the handicapped. They should also be made to understand that a capable support system will be available to teach and maintain the learner until the initial strategies can be faded and natural contingencies can take over.

5. Effective techniques used to train severely retarded individuals can also be used to increase productivity of the average worker. This approach can sometimes be used as a selling point for developing work stations in industry programs.
6. Severely retarded learners can learn a large number of vocationally related skills during their school years. Therefore, teachers of young as well as older severely retarded students should participate in designing vocationally related activities.
7. Prevocational skills are valuable to severely retarded students, but if a given learner has not attained certain of these skills they can be eliminated from a vocational training program (Horner & Bellamy, 1978). In other words, a severely retarded learner who may not have mastered all potential prevocational skills and who is old enough to move toward community participation should be taught complex vocational tasks. In many cases, prevocational skills can be taught simultaneously with the vocational preparation, allowing the student to learn both sets of skills in the natural setting.
8. Another important task for the teacher is to work closely with vocational specialists to become more familiar with potential employment outcomes, viable community training sites, new and nontraditional jobs, and jobs where retarded learners can work together to complete skill sequences.
9. It is necessary to use Brown's (1981) two criteria of functionality when determining whether or not skills are appropriate;
 - a. If students cannot perform a certain skill, does someone else have to be hired to perform the skills for them?
 - b. Has an adaptation been developed so that the student can perform the immediate functional use of the skill?

Following these guidelines will allow professionals to decide whether to teach, for example, the colors of objects versus toileting skills or stringing beads on a string versus assembling a complex industrial product.

10. The procedures of instructional analysis should be applied to break down complex vocational skills into teachable components (Gold & Pomerantz, 1978; Horner & Bellamy, 1978). In this way, teachers are better able to invoke what Brown (1981) termed the *principle of partial participation*. That is, a complex skill repertoire analyzed into manageable instructional subcomponents allows even the most severely retarded learner to participate in the activity at some level.
11. Many severely retarded learners have additional handicapping conditions (such as visual, hearing, or physical impairments). Therefore, teachers must keep in close contact with rehabilitation personnel in order to monitor the technological advances that may increase the probability of vocational success for these students.
12. Programming for generalization is especially important when teaching prevocational and vocational skills (Langone & Westling, 1979). The more learned skills

- can be practiced across different reinforcing conditions the better the chance that skill sequences will be useable to the learner.
13. It is important to use realistic materials. Simulation activities are used only as long as necessary, and are faded as quickly as possible. For example, the safe use of basic tools may be a more desirable goal than learning to cut with scissors.
 14. It is necessary to define the vocationally related behaviors in measurable terms and maintain an ongoing monitoring system. Used in conjunction with a task analysis, monitoring and charting can provide teachers with a thorough assessment system for these learners. For example, Bates, Renzaglia, & Clees (1980) used a changing criterion design to monitor the effect a self-administered reinforcement system (paying oneself after completion of a prespecified task) had on a student's work behavior.
 15. In grouping students for community job sites, more severely retarded students should be placed with moderately retarded learners.
 16. Scheduling teacher time for community training should be a joint exercise including all special education teachers in a school. For example, if one teacher is out with five members of his class for part of the day, another teacher could supervise the aide teaching the remainder of his class.
 17. High school students, community volunteers, and in some cases employees already at the site can assist at the work site as peer tutors.
 18. Crouch, Rusch, & Karlin (1984) provided evidence that co-worker prompts can be an effective teaching strategy to improve the vocational skills of retarded learners. In their study co-workers were taught to use verbal cues designed to initiate a set of skills previously learned by the students.
 19. Picture cues have proved to be an effective strategy for teaching vocational skills. For example, Fisher (1984) was able to teach moderately retarded learners to assemble complex products using assembly drawings as a guide. Wacker & Berg (1983) got similar results using picture prompts.
 20. Some vocational and social skills related to work settings can first be taught in game format and later generalized to actual work sites (Foxx, McMorro, & Mennemeier, 1984).
 21. Food services have become popular training and competitive work sites for retarded learners (Brickey & Campbell, 1981). For example, Schutz, Jostes, Rusch, and Lamson (1980) used contingent preinstruction (using verbal cues to remind trainees what tasks they forgot to complete or did not complete correctly) to train students for competitive employment in cafeterias.
 22. Clarke, Greenwood, Abramovitz, and Bellamy (1980) used summer jobs to train retarded adolescents in advanced vocationally related skills. Sowers, Rusch, Connis, and Cummings (1980) improved the time management skills of retarded individuals by using a system of verbal and picture cues.



KEY CONCEPTS



- The relationship between special and vocational educators goes beyond IEP development into a parallel teaching approach. Teachers teach the same student similar skills under different conditions.

- Curriculum modification is an important part of developing vocational programs for retarded learners. The role of the special educator is to help the vocational education teacher identify the points in the curriculum most important for the student.
- Identification of nontraditional employment options such as job sharing and parts of jobs that a learner can accomplish is an important component of program development for the moderately and severely retarded.
- The role of vocational specialists becomes more advisory in programs for the severely retarded.
- Sheltered workshops are not necessarily the best placement options for the retarded.
- The supported work model allows retarded learners to participate in paid and non-paid employment based in community work sites.
- Behavioral approaches including task analysis, arranging antecedent events, controlling consequences, and applying proven principles of behavior have been most effective in teaching work skills.

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PHYSICAL/MEDICAL PROBLEMS: CONSIDERATIONS FOR TEACHING MENTALLY RETARDED LEARNERS

■ In the past, public school teachers had little or no contact with learners afflicted with multiple handicaps. Students who were mentally retarded in addition to suffering from other physical and medical problems were often served in state or private institutions. Fortunately, Public Law 94-142 now allows these students more opportunities for public school placement. Including multiply handicapped learners into public school classes, however, can create problems for special educators. Teachers should, at the very least, be aware of resources and instructional implications that may help them to develop more appropriate programs for these students.

This chapter highlights some of the basic strategies and classroom considerations for retarded learners who have additional physical, vision, hearing and health impairments. By working closely with other specialists (e.g., physical therapists, occupational therapists, and physicians), teachers can incorporate more appropriate curricular options into the classroom. For example, students who only attend physical therapy once a week for 1 hour can benefit from a program that includes some physical therapy exercises in their daily classroom activities. In this instance, the classroom teacher works closely with the physical therapist to learn the techniques necessary for conducting these basic exercises.

This chapter also presents teachers with educational implications or strategies for providing more effective instruction to retarded learners with multiple disabilities. Topics such as scheduling, transportation concerns, equipment maintenance, and material adaptations are important points for consideration.

Finally, technology is advancing at such a rapid rate that practitioners are not always aware of devices available to aid learners with multiple handicaps. Therefore, a section acquainting the reader with adaptive equipment is included.

WORKING WITH OTHER SPECIALISTS

Special educators are part of an interdisciplinary team, each member providing his or her expertise to develop better programs. Because of this relationship, it is important for teachers to understand the roles of other key people in the team.

Licensed physical therapists must have graduated from approved college programs and have passed license examinations given by the state in which they intend to practice. Physical therapists can provide services to learners with a wide



Fortunately, P.L. 94-142 allows students with multiple handicaps more opportunities for public schools placement. (Courtesy of Kay Shaw)

array of problems ranging from developmental delays to cerebral palsy. These services include assessment and development of exercises for range of motion, positioning, muscle strengthening, and perceptual-motor problems.

Occupational therapists provide skills in evaluating, task analyzing, and developing activities to improve a learner's independent living skills. The role of occupational therapists is broad, ranging from developing adaptive equipment for teaching feeding skills to designing exercises to strengthen a person's muscle tone and use of limbs.

There are a variety of skills and ideas the occupational therapists can provide to special educators. One of the most useful involves designing equipment adaptations assisting handicapped learners to become more independent. For example, an occupational therapist could adapt kitchen equipment so that a physically handicapped learner could participate in cooking activities. Consequently, special educators should become more familiar with the abilities of occupational therapists, requesting that these professionals not only participate on a consulting basis but also assist in training teachers in techniques to adapt equipment and materials.

Medical personnel such as physicians and nurses are becoming increasingly more important service providers. Unfortunately, in some instances there is little, if any, direct contact with special educators. Previous to the enactment of Public Law 94-142, students with serious health impairments were generally excluded from school either permanently or during the length of the recovery period, which caused them to fall behind their peers in school work.

Fortunately, these learners now have the right to receive an education within a public school setting, or in the case of a recovery period, in a hospital or homebound setting. Teachers who come in contact with learners suffering from health impairments must be in continual contact with medical personnel. Understanding the implications of certain treatments and diseases can be a great help when designing educational interventions. For example, a retarded learner who is suffering from a congenital heart problem requires frequent rest periods. Similarly, learners who require drugs for various problems may exhibit side effects adverse to learning. In the latter example, teachers can provide valuable information to physicians that might result in a modification of the dosage.

Medical professionals can be a valuable asset when developing public school programs for retarded learners. The nature of their work, however, will not make them easily accessible to teachers. Teachers may need to take the initiative and request their assistance.



KEY CONCEPTS



- Today, mentally retarded learners with additional disabilities are more often served in the mainstream of public education.
- Special educators are increasingly incorporating into their classrooms exercises and activities designed by others who specialize in physical therapy, speech and language development, vision and hearing impairments, and occupational therapy.

- Special educators are part of an interdisciplinary team to which each team member provides different knowledge and skills.
 - Physical therapists assess students' physical disabilities and develop activities to improve locomotion, positioning, range of motion, and muscle strength. Occupational therapists assess students' physical disabilities in relation to how they can accomplish tasks given certain adaptations. They specialize in adapting activities and equipment to meet the needs of the students.
 - Medical personnel can help teachers to understand how physical or medical problems of students will affect their learning. They can also help teachers understand the medications prescribed for students, including their side effects and influence on instruction.
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TYPES OF PHYSICAL IMPAIRMENTS

Most teachers of retarded learners will at some time come in contact with students who also suffer from some type of physical affliction. The physical disability most prevalent among retarded learners is cerebral palsy. Cerebral palsy is a result of "nonprogressive" injury to the immature brain that causes symptoms such as neuromuscular disability and general motor dysfunction (Verhaaren & Connor, 1981a). A primary characteristic of this condition is that the disability is fairly stable and does not degenerate over time (Reynolds & Birch, 1982). There are a number of different forms of cerebral palsy, depending upon the location of the brain where the insult occurred. The three most common are as follows:

1. *Ataxic*: Inability to control body movements, causing balance problems.
2. *Spastic*: Increase in muscle tone, resulting in abrupt contractions of muscles.
3. *Athetoid*: Uncontrolled, slow, jerky movements.

Although cerebral palsy is the most prevalent condition seen by teachers, their students may suffer from one of the other handicapping conditions. The following brief list of less prevalent disabilities is provided for reference purposes:

Muscular dystrophy: Progressive muscle degeneration resulting in weak muscles, awkwardness, and slowness of movement. One common childhood form is fatal.

Osteogenesis imperfecta: Characterized by brittle bones.

Spinal cord injury: Can be a result of an automobile or other type of accident. The extent of the disability varies; however, paralysis generally occurs below the level of the cord injury.

Legg-Perthes disease: A hip disorder. The treatment often results in a brace or cast and can be accomplished surgically. The condition is temporary, depending on the amount of damage to the femoral head before treatment (Sirvis, 1982).

Arthritis: Inflammation of joints and connective tissues that makes motion difficult.

Loss of limbs: A loss of a limb may be either congenital or a result of amputation. The amount of the limb that is missing often dictates the amount of rehabilitative training that a person requires.

CLASSROOM CONSIDERATIONS FOR RETARDED LEARNERS WITH PHYSICAL HANDICAPS

The educational objectives targeted for a given learner are dependent upon that learner's needs. All retarded learners basically are working toward enhancing their skills for independence. Retarded learners with physical disabilities will participate in curricular areas designed to teach independence; however, a common denominator for all their activities will be the adaptation of methods and materials according to their specific physical disabilities. Program time should be allotted daily to continue with basic exercises developed by the physical and occupational therapists. The following is a list of general suggestions that teachers may find helpful when programming for learners with physical disabilities.

1. Resource teachers who have the opportunity to mainstream mildly retarded learners into regular class activities should plan on assisting the general education teacher and peers in becoming more aware of handicapping conditions. This awareness can often be accomplished by allowing the general education students to simulate a specific disability and attempt to function under those conditions. The student with the physical handicap can direct the activity, providing the other students with advice on overcoming the handicap.
2. It is important for teachers to learn to properly position learners with physical disabilities. Physical and occupational therapists can demonstrate to teachers how to position a student in relation to a task (Verhaaren & Connor, 1981b). Basically, positions should enhance as normal a posture as possible. Therefore, if the task involved self-feeding, the teacher would want to place the learner in an upright position. (Interestingly, in some classes for multiply handicapped learners the opposite occurs: the learner is fed while in a reclining position.)
3. If a learner uses a prosthesis, the teacher should be aware of the basic maintenance and adjustments needed (Gearheart & Weishahn, 1976). For example, as children grow older teachers should be aware of proper fit of the prosthesis.
4. Learners suffering from an amputation require training in proper hygiene of the stump. For these learners, teachers should consult medical personnel regarding proper cleaning techniques.
5. Learners with physical disabilities have varying vitality levels. These students should be observed in order to note their peak energy levels in relation to class schedules. In this way, teachers can help learners to conserve energy based on scheduled events (Reynolds & Birch, 1982).
6. There is never as much time in the school day as necessary. Therefore, midday interruptions for sessions with physical therapists can serve to disrupt many other activities. With this in mind, teachers should attempt to work with therapists to schedule therapy sessions at the beginning or end of the school day (Bigge, 1982).

7. It is important to identify the methods that learners with physical handicaps can best use to communicate. For example, can the learner produce intelligible speech, or are sign language and gestures more appropriate (Pasanella & Volkmar, 1981)? Similarly, a physically handicapped learner may be able to communicate more efficiently with an electric typewriter fitted with a template than with paper and pencil.
8. Learners who cannot communicate may have their actual functioning level underestimated by teachers. Therefore, teachers should endeavor to discover ways to facilitate a better understanding of what knowledge a learner possesses. The typewriter in the previous suggestion is one possibility. Carefully wording questions that the learner answers by choosing the correct option is another. Testing a physically handicapped learner's reading comprehension level may not be possible in a traditional manner if the student is unable to communicate via oral or written language. What may be possible is a system that allows the student to listen to a story, and choose the correct answer to an oral question by gesturing. Although this method does not exactly assess reading comprehension skills, it does assess listening comprehension, a set of skills necessary for community participation.
9. Teaching the meaning of "yes" and "no" can open many doors for retarded learners with physical handicaps. One approach is to start by using a model and asking whether or not the student would like a dessert (Bigge, 1982). Once the concepts and respective gestures are taught, learners can carry a card with them (or taped to their wheelchair) explaining to others how they respond to questions.
10. The student's repertoire can be increased by teaching signals for "I don't know," "Sometimes," and "Maybe" (Bigge, 1982).
11. Pictures are a good communication tool. For example, learners could have a small notebook with pictures of various leisure activities. When asked what they would like to do, they could answer by pointing to the preferred activity. This approach can be modified any number of ways, allowing students the chance to make choices.
12. Another important task is to identify potential emergency procedures requiring extra assistance (e.g., responsibility for students in wheelchairs during a fire drill or procedures involved if a student with osteogenesis imperfecta is injured).
13. Teachers should be more aware of the physical environment of the classroom when planning for learners with multiple handicaps (Bednar, 1981). A classroom generally includes a number of learning centers. These centers should be set up in such a way as to accommodate learners in wheelchairs and with crutches.



KEY CONCEPTS



- The physical disability most common among retarded learners is cerebral palsy.
- The three most common forms of cerebral palsy are ataxic, spastic, and athetoid.
- Learners suffering from physical disabilities participate in activities designed to help them to be as independent as possible.

- Mainstreaming retarded students with other disabilities into general education classes may be facilitated by allowing the nonhandicapped students to simulate the specific disability.
 - Teachers should be aware of the basic maintenance of a student's prosthesis.
 - Teachers should also be aware of a student's peak vitality level.
 - Students who are unable to communicate orally require an alternate means to express themselves. Identifying alternate communication systems for learners should be a program priority.
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CLASSROOM CONSIDERATIONS FOR LEARNERS WITH VISUAL IMPAIRMENTS

Visual impairment is a low-incidence handicapping condition (Nolan, 1982). Therefore, few retarded learners will also be severely visually impaired. A more likely situation is that teachers may have to program for a small number of students who are low-vision or partially sighted, conditions that may occur particularly in learners who have cerebral palsy (Bigge, 1982). There are a number of suggestions that teachers may use for teaching retarded learners who have varying degrees of visual impairment.

1. The classroom should be arranged so that the partially sighted student does not work in a glare or have to observe others whose backs are to windows (Pasanella & Volkmar, 1981).
2. Mobility training will be an immediate program goal. For instance, the student should be oriented to the classroom, surrounding parts of the building, the playground, and so forth and allowed to practice getting from one place to the other. Once the learner is oriented to the classroom, furniture should not be moved out of place and doors should not be left ajar without notifying the student.
3. Additional lighting such as a study lamp can be a valuable tool.
4. Good posture should be taught to students with visual impairments, and their use of inappropriate mannerisms associated with blindness should be discouraged. This task can often be accomplished by pairing the mannerism with a cue (e.g., bell or verbal reminder) notifying the student that the behavior is occurring. The logical extension to this suggestion is to teach a more appropriate behavior that can be substituted for the inappropriate one.
5. Close contact with the school district's or cooperative education agency's specialist on visual impairments will be necessary. This professional can be invaluable for providing resources and skills for program development.
6. Peers make excellent sighted guides to assist in school and community mobility (Cooke, Heron, & Heward, 1983).
7. When talking to visually impaired students, teachers should remember to talk directly to their faces and call their names to alert them to the coming verbal instruction (Pasanella & Volkmar, 1981). This strategy acts as a model for appropriate behavior from other students in the class.

8. The state department of education's specialist for the visually impaired can provide information on how to obtain large-print books, talking books, and other pertinent resources.
9. The entire class will want to know how to use adaptive devices such as magnifying aids, and why they are necessary for the visually impaired student. (Pasanella & Volkmar, 1981). If braille might be used by a mildly retarded learner, the system should be introduced to the entire class. In this way, students will better understand the ramifications of using braille.
10. Visually impaired students should practice dealing with changing environments. These skills can be developed by changing the physical environment of the classroom and teaching the students to reorient themselves to the changes. The logical extension of this strategy can be to change some of the cues in different parts of the school as well as in the community. In each instance, the subsequent changes in the student's mobility would also be taught. It is important to consult a mobility specialist to learn specific training techniques such as the long cane, sighted guide, electronic devices (e.g., horns at crosswalks), and dog guides.
11. Blindfolding all students is a good class exercise that allows them to experience forms of mobility training.
12. Precise verbal instructions are important to all students, but are particularly vital when speaking to visually impaired learners. Teachers should be sure to have a clear beginning and end to all verbalizations and should ask the students to repeat the directions.
13. Concrete materials should be used as much as possible. They can be faded from the instruction as student progress warrants.
14. Modeling may not be as effective a strategy with these learners as with others; however, if the student is partially sighted, modeling can be used at a slower rate.
15. Visually impaired students should not be involved for long periods of time in tasks requiring close visual inspection (e.g., workshop or vocational tasks). It can be helpful to alternate the tasks with rest periods.
16. Teachers who often use their facial expressions to reinforce students should incorporate more touching into their reinforcer menus.
17. Peer tutors can read information to mildly retarded learners with visual problems. Parents, other students, and volunteers from service organizations can tape-record classroom materials, newspaper articles, directions, and recipes, thus providing a wider array of activities.
18. Activities instructing students to use their listening skills more effectively are important. For example, students could be taught to listen for key words in the verbal directions given by different people.
19. Community skills such as shopping, recreation, mobility, and safety are vital. Care of the home, grooming, and other independent living skills should also be included in the program.

CLASSROOM CONSIDERATIONS FOR LEARNERS WITH HEARING IMPAIRMENTS

A whole new set of considerations faces teachers when hearing impaired learners are placed in their classrooms. This can be of particular concern when the learner's

primary disability is mental retardation, since the hearing impairment exacerbates problems of poor language and communication skills that already exist.

The education of hearing impaired individuals encompasses a variety of philosophical approaches that lead to different techniques for teaching these learners. One reason for this diversity is because the hearing impaired are a heterogeneous group, ranging from individuals whose degree of hearing loss is mild to moderate and can be corrected with amplification to students whose hearing loss is severe, allowing for only a minimum of residual hearing with amplification (Moore, Maestas, & Moore, 1981). The type of hearing loss can also have a great effect on the learner's program. For example, a student with a conductive hearing loss (a blocking of sound from the auditory canal to the inner ear) can be assisted either by surgical treatment or amplification. Conversely, learners with a sensorineural hearing loss (damage to the auditory nerve and other areas) would need to be treated differently because amplification in these cases results in distortion of sound or low tolerance to amplification (Larson & Miller, 1982). Therefore, the type of hearing loss is an important consideration for educational programming, and a teacher of the hearing impaired should be consulted to find out some of the more technical information concerning adaptations.

Knowing the student's age at the onset of the disability can be useful for designing an educational program, for it will have a profound effect on the student's ability to use language.

A program for hearing impaired learners emphasizes the teaching of language skills in one of three ways. First, the oral/aural method involves the use of auditory training (using whatever listening skills are available), oral training (speech therapy involving articulation), and lipreading (Larson & Miller, 1982). The extent of the handicapping condition will determine the words/sentences or gross sounds and rhythmic speech patterns used. This method provides a learner with valuable skills; however, some students cannot seem to master the skills necessary to learn by these techniques.

The second method involves manual communication, incorporating the techniques of fingerspelling and American Sign Language (Reynolds & Birch, 1982). Fingerspelling uses positions of the fingers to represent letters, while sign language incorporates gestures to represent words or concepts. The major drawback to this approach is that for individuals who cannot read, language is difficult to teach via this method. Also, there are numerous semantic differences between sign language and English (Larson & Miller, 1982).

Finally, the method of total communication includes both the oral/aural and manual approaches. The philosophy of this technique is to match the appropriate skills to the learner's current expressive-receptive language (Garretson, 1976). Unfortunately, this system has not yet been standardized among professionals; therefore, there is disagreement as to when to use what approaches. Also, this method fails to advocate the use of residual hearing, which may leave the student without a valuable resource.

Which of the three methods is the most beneficial to hearing impaired learners is a subject of controversy. The most logical course may be to assume that they all have merit and the method chosen is dependent upon individual students'

strengths, weaknesses, and to some extent their needs at any given point in their lives. Clearly, the oral/aural method is sophisticated and if mastered can provide learners with a vast array of skills to progress toward their maximum ability. However, this system may be too complicated for some retarded learners. For them, manual communication or total communication would be the answer. Working with a specialist in hearing impairments allows the classroom teacher to become more familiar with why a method is being used as well as how the method is used.

The following suggestions are presented for special educators whose retarded students may also have varying degrees of hearing impairments. An important aspect involves becoming more aware of problems that exist. Therefore, the first four suggestions help to identify potential hearing problems.

1. A learner having trouble paying attention to classroom activities may have a mild hearing problem. Try asking the student questions from various points in the room when he or she is not looking at the speaker, and note the response.
2. Learners who have trouble following oral directions but can follow a written direction may require a hearing screening. In addition, learners who continually ask classmates to explain directions should be observed more closely.
3. Learners who turn their heads to one side in attempting to hear the teacher may need to be screened for hearing problems.
4. Learners with hearing problems should not be confused with those exhibiting auditory perception problems. In both cases the learners may have difficulty following directions; however, the problems are entirely different. The safest course to take is to have the learner screened for a hearing impairment first. If no physiological reason (acuity loss) emerges, then an assessment for an auditory processing problem should be administered.
5. Peer tutors can act as relays to learners with hearing impairments, supplying these students with directions given in class.
6. Rearranging the classroom allows students to sit near the teacher and move closer to the "action" when they feel it can improve their hearing. In some classrooms students feel intimidated about moving without lengthy explanations to the teacher.
7. Teachers should face students with hearing impairments when speaking to them. Students can pick up a number of cues from lips, facial expressions, and pointing (Hart, 1981).
8. When teachers stand with their backs to the windows the glare can decrease the students' ability to see lips and facial cues (Pasanella & Volkmar, 1981).
9. Students who have hearing problems tire easily because of the intense concentration involved in trying to pick up additional cues. Therefore, one strategy is to shorten and vary the instructional times.
10. Hearing aids should be checked daily for proper working order (Pasanella & Volkmar, 1981). Keeping extra batteries at school, as well as other parts that may need to be periodically changed (e.g., twisted or broken cords), can save valuable teaching time.

11. Teachers should be familiar with hearing aid adjustment to eliminate squealing. Hearing aids amplify all sounds (Pasanella & Volkmar, 1981), making it necessary to decrease external stimuli and train the learner to discriminate between important and nonessential sounds. New improvements in hearing aid systems are minimizing this problem, but teachers should be aware that distractions can still occur.
12. Concrete experiences should be used as much as possible. This principle is basic for all retarded learners, and it is especially vital for those with hearing problems.
13. Some hearing impaired students will turn down the volume of their hearing aids, effectively "turning off" the teacher's presentation. This behavior may indicate a lack of program relevance, difficulty of concepts, or lack of concrete experiences. In any case, a program modification will be necessary.
14. Very clear and distinct prompts, introduced slowly, are vital. For example, when referring to objects or occurrences, teachers should point in the direction of or walk over to the area of the occurrence (Reynolds & Birch, 1982).
15. Captioned films are available for use. The hearing impairment specialist in the school district or the state specialist should be able to provide information on how to obtain these films.
16. It is helpful to supplement discussions or verbal directions with pictures and diagrams. Overhead projectors or opaque projectors are also excellent instructional tools.



KEY CONCEPTS



- Teachers may encounter retarded learners who are partially sighted or have mild to moderate hearing problems.
- Glare in the classroom can be a problem for both vision and hearing impaired students.
- Mobility around the school, home, and community should be a priority goal for visually impaired students.
- Teachers should become familiar with all adaptive equipment and magnifying aids that can help visually impaired students in their work.
- The ability to develop the appropriate use of language can be the major deficit of a hearing impaired learner.
- Teachers should be very familiar with the maintenance of hearing aids, always having extra batteries and cords on hand.
- Vision and hearing impaired students should sit close to the teacher.
- Instructional sessions for these students should be shorter.
- Peer tutors can be a valuable asset to vision and hearing impaired students.

CLASSROOM CONSIDERATIONS FOR LEARNERS WITH HEALTH IMPAIRMENTS

Learners with health impairments differ from those with orthopedic problems. Generally, they have limited strength due to acute medical problems. These problems can be the result of rheumatic fever, tuberculosis, heart conditions, acute asthma, leukemia, epilepsy, diabetes, hemophilia, and a number of other medical conditions that can adversely affect a learner's performance. The incidence of retarded learners suffering from problems resulting from such conditions is low; however, these conditions do exist. Awareness of this is important because children suffering from such problems often do not outwardly show any physical disabilities.

The most prevalent medical problem of retarded learners is epilepsy, a seizure disorder characterized by abnormal electrical brain discharges. Seizures range in severity from mild (petit mal) seizures to severe (grand mal) seizures. Petit mal seizures usually result in minimal behavior change, noticeable only by a brief lapse in a student's attention. Grand mal seizures, on the other hand, result in uncontrolled movements of the arms and legs with a loss of consciousness. There are other types such as psychomotor seizures that will not be seen as often by teachers. They primarily involve a disruption in locomotion and gait.

Overall, there are a number of educational implications for learners with health impairments. Some of these implications involve specific conditions and some are generic, that is, they can apply to any medical affliction. In addition, there are a number of emergency medical procedures that teachers should be aware of in the event that a health-related problem should arise. The following are suggestions that may be helpful for teachers who have health-impaired students in their classes.

1. On the whole, learners with health impairments will tire more easily than others. Therefore, activities should be adapted to each student's need. For example, a student might need to participate in shorter work sessions alternating with rest periods or activities that require less energy.
2. Students with health impairments should be taught to pace themselves according to their own needs. This task may not be easy when a student wishes to "keep up" with peers. One alternative is to structure the class so that all students establish individual schedules. That way, the health impaired student would not necessarily be singled out as being different.
3. At times teachers may confine themselves to talking only to the learner's parents in regard to any medical implications of the health impairment. Relying only on this source of information may not be enough. The teacher should attempt to arrange a meeting with the student's physician in order to obtain information such as what side effects to expect from prescribed medication. This strategy also allows the teacher to establish realistic physical parameters for the student based on the judgment of the doctor.
4. Learners who have severe health problems often are absent from school for long periods of time. In these instances, teachers should develop a close working relationship with the district hospital homebound teacher.

5. In addition to developing a working relationship with the homebound instructor, the classroom teacher should develop home training packages. These packages should go beyond merely sending home classwork. Rather, each training package should resemble a module with specific objectives, activities, teacher behaviors (discriminative stimuli, consequences), generalization activities, and a means to monitor student progress. This approach allows teachers of homebound students to maximize the use of their time with the students.
6. Students with diabetes (inability to utilize and properly store sugar) will exhibit a number of symptoms indicating potential problems that teachers should be aware of.
7. When a learner with diabetes is placed in a classroom, the teacher should request a meeting with the family physician and parents. Questions should be asked concerning the learner's specific symptoms that indicate either an insulin reaction or a diabetic coma. Also, the teacher should ask the physician what the specific emergency procedures would be given the needs of the student involved. Insulin reaction can be triggered by environmental events (e.g., exhaustion, lack of specific foods, etc.). The teacher should ask the physician to list such potential conditions so that classroom modifications can be made.
8. Teachers should consider taking a course in cardiopulmonary resuscitation (CPR). This training is vital if a student with heart problems is enrolled in the program.
9. Students who suffer from epilepsy will generally not need any specific curricular changes. However, teachers should be well versed in procedures for dealing with grand mal seizures. Remaining calm and handling the situation in a matter of fact way are important considerations. Teachers who panic or act excited are modeling inappropriate behavior for the other students in the class.
10. Some teachers feel that they should restrain the learner suffering from a seizure. This response is inappropriate, serving only to injure the child or in some cases the teacher. Instead, tables and chairs should be moved away from the student, allowing him or her to complete the seizure unencumbered.
11. Solid objects should *not* be forced between a learner's teeth or attempts made to reach into the mouth. It is a misconception that people having seizures will swallow their tongues.
12. Medical personnel should be alerted if the learner has a prolonged seizure or if more than one seizure occurs in succession.
13. If the student requires medication during school hours, the teacher should be constantly aware of the time scheduled for the medicine to be taken so that it won't be missed.
14. Students who suffer from petit mal seizures run the risk of missing work presented by the teacher. This can escalate into a problem if the teacher is not aware of the seizure activity and blames the lack of attention on "daydreaming." In such cases teachers should be prepared to repeat directions and frequently check to see whether or not the learner is on task.

ADAPTIVE EQUIPMENT

Advances in technology often outpace the practitioner's ability to keep abreast with these developments. The scope of this chapter precludes the presentation of an

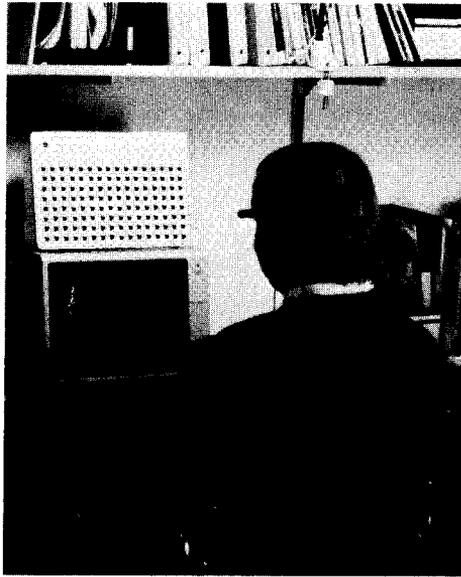
in-depth list of technological advances and adaptive equipment that would benefit mentally retarded students. However, the following section presents representative samples from each area as well as resources where teachers can obtain further information.

Self-Care Equipment

1. Food guards or plate guards are available to assist learners who have difficulty picking up their food using common utensils.
2. A number of adaptive pieces of silverware are available on the market. Spoons and forks with handles on them are examples of these items (e.g., utensils held by finger rings and various group holders).
3. Bigge (1982) suggested using a meat cutting wheel for those who are physically unable to manipulate a knife.
4. Various sandwich holders are commercially available or can be built to accommodate a learner's needs. These holders allow a student with little motor control to eat semi-independently.
5. Students with physical disabilities often have a great deal of trouble with either bladder control or independent toileting. This problem requires the attention of teachers because a person should be allowed as much privacy as possible during toileting. The main consideration will be to develop a system whereby a student with little motor control can sit on a toilet with no assistance. Also, teachers should become familiar with catheters and external collection devices if they are needed by a given learner. An excellent source for an in depth discussion of these devices is Bigge (1982).

Instructional Aids

1. Handheld calculators and computers can be valuable tools for all learners.
2. Traditional instructional aids such as slide projectors and tape recorders can be adapted with microprocessor switches that can be manipulated by physically disabled students.
3. Microcomputers, mentioned several times throughout this text, can be a great asset to multiply handicapped learners (Kokaska & Brolin, 1985). For example, talking computers (speech synthesizers) exist that allow students to "speak" for the first time. Students can manipulate the computer in a variety of ways including pressing an electronic switch with their heads to choose the words they want the computer to vocalize (Hasselbring, 1985).
4. Electronic speech synthesizers are available that simulate the human voice. The Phonic Mirror Handi Voice, for example, can simulate over 800 words. Hardware such as this can be combined with educational software to improve many academic skills (Beltz, Detwiler, & Grant, 1983; Bratt, 1983; Turkel & Podell, 1984).
5. Machines exist to magnify type via closed circuit television systems.
6. Variable-speed tape players can assist students in listening to important material at slower speeds without distorting the sound.



Students with severe physical disabilities can use computers with the help of adaptive equipment. (Courtesy of Pretke Romich Company)

Other Adaptive Devices

1. Electronically controlled wheelchairs continue to become more sophisticated, for example, chairs that respond to the voice activated commands of only the hand-capped person.
2. Communication aids for hearing impaired individuals such as Telecommunication Devices for the Deaf (TDD) allow them to communicate with others over the telephone.

KEY CONCEPTS

- Students with health impairments generally have limited strength and stamina.
 - Some retarded learners suffer from epilepsy. Grand mal seizures result in uncontrolled movement of the arms and legs with a loss of consciousness.
 - Seizures can easily be handled by making sure the student will not be hurt if he or she falls. Teachers should record the incident and report it to their supervisor and the student's parents.
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