

***Training Program for SC/ST professionals working in
the area of Mental Retardation***

National Institute for Mentally Handicaped (NIMH), Secunderabad

e-Saadhya



Centre for Development of Advanced Computing
(A Scientific Society of Ministry of Communications and Information Technology)
Government of India
C-DAC, Knowledge Park, No.1 Old Madras Road
Byappanahalli, Bangalore 560 038

e-Saadhya (Saral Anukulaney Adhyayan)

Adaptable & Accessible e-Learning Framework for the Children with Mild Mental Retardation and Autism

I. INTRODUCTION

e-Saadhya (**Saral Anukulaney Adhyayan**) is an Adaptable & Accessible e-Learning framework for the children with mild mental retardation and autism. The e-Learning framework is named as “e-Saadhya” which is an acronym for “Saral Anukulaney Adhyayan” which is a Sanskrit meaning for “Saral” meaning “Accessible”, “Anukulaney” meaning “Adaptable” and “Adhyayan” meaning “learning”. e-Saadhya is an education framework for children with mild mental retardation and autism. This framework is a combination of standard diagnostic and special educational assessment checklists, special educational teaching methodologies namely ABA, DTT, using audio visual prompts and reinforcements, Curriculum Based Measurement Support provided by enabling the special educator/parent in creating associated Assessments/Quizzes for each lesson created. Thus, supporting both Receptive and Expressive modes of learning for the special needs child. This Environment is user friendly with cognitive accessibility features embedded with audio video navigational guidance and Voice support. A mobile based augmented reality solution is also developed to interactively teach the children with real world pictures. This supports dynamic creation audio visual Schedules, Speaking albums by a Parent or a special educator after which these can be accessed and used by the special child over a Mobile Device.

It is an initiative of e-Learning division of Department of Electronics and Information Technology (DeitY), Government of India and being implemented by C-DAC Bangalore and C-DAC Hyderabad in collaboration with National Institute For The Mentally Handicapped (NIMH), Secunderabad. Phone: 66116406, ictsw@cdac.in.

To start with, the individual profile of the child has to be inserted into the framework. The individual profiling module comprises of features like child registration to capture case history, features to support initial placement of the child into the school, i.e., the class in which the student has to be placed based on his/her performance in a standard assessment checklist known as “Functional Assessment Checklist Programming” (FACP) assessment, supports promotion/retention of the child based on the performance in the formative and summative assessments. The Assessment module of e-Saadhya includes features such as “Indian Scale for Assessment of Autism” (ISAA), “Sensory Screening Checklist”, “Computer Readiness Checklist” and “Reinforcement Checklist”, “Special Educational Assessment”, “Grade Level Assessment Device” (GLAD), “Madras Developmental Programme System” (MDPS) and “School Specific Assessment Checklist”. Software supports voice recording of the child’s name by the parent/instructor, uploading of photo (image) of the child,

The Individualized Educational Planning (IEP) Module provides support to plan Annual goals, short term objectives, task analysis record, formative and summative assessments and group teaching lesson plan for the child. The Computer Assisted Instruction (CAI) Module supports creation of training package (like Matching, Comprehension, etc) and personalizing the training package for each child. The Curriculum Based Measurement/Assessment (CBM) Module supports creation of quiz (Multiple Choice, Match the following, Sorting/Ordering, and Fill in the Blanks) and personalizing the quiz for each child. The Rendering and Evaluation Module, also known as the “Individual Learning Environment” or the “Child Learning Environment” includes features such as lessons, stories, quiz, entertainment including games, videos, songs

with voice support. The utility support module comprises picture glossary, reinforcement library, lesson/exercise repository, schedulers and timetables with mobile support and user manuals.

The Decision Support System (DSS) Module suggests lessons based on IEP goals set for each child. The collaboration module provides internal e-mail, whiteboard and chat facilities where children and special educators can communicate with each other.

The Child Learning Environment supports features of “Fun and Learning”, “Online lessons”, “attempting quizzes”, “Collaboration” with chat and email facilities for the child. This Environment is user friendly with cognitive accessibility features embedded with audio video navigational guidance and Voice support.

A mobile based “Augmented Reality” based solution is also developed to interactively teach the children with real world objects by taking their pictures and embedding into lessons. This supports dynamic creation of audio visual Schedules, Speaking albums by a Parent or a special educator after which these can be accessed and used by the special child over a Mobile Device.

II. COMPONENTS & FEATURES

The diagram as depicted in the fig 1. Shows the features of the Adaptable and Accessible e-Learning Framework being implemented to be accessed on a computer environment from web browser. Some of the Individualized features like schedulers and time tables and Autism specific teaching interventions like teaching social stories and social behaviors etc. are accessible over mobile environments.



Fig 1. Features Supported in the Solution

A. MODULES:

- a. Administration Module
- b. Child Profiling Module
- c. Initial Assessment Module
- d. Individualized Educational Programmes (IEP) Module
- e. Self-Instruction Module (With CAI Module and CBM Module)
- f. Rendering & Evaluation Module
- g. Utility Support Module
- h. Decision Support System (DSS) Module

1.0 Child Profiling Module

- a. Child Registration
- b. Initial Placement details are included based on the performance of the child in FACP assessment
- c. Promotion/Retain of the child is done based on the performance of the child in FACP
- d. Voice recording of the child's name by the user is included
- e. Photo of the Child (Image) uploading is possible in the Updation pages
- f. General Services/Case History
- g. Indian Scale For Assessment Of Autism (ISAA)
- h. Sensory Screening Checklist
- i. Computer Readiness Checklist
- j. Reinforcement Checklist

2.0 Initial Assessment Module

- a. Special Educational Assessment
- b. Grade level Assessment Device (GLAD)
- c. Functional Assessment Checklist Programming (FACP)
- d. Madras Developmental Programme Scale (MDPS)
- e. School Specific Checklist

3.0 Individualized Educational Programmes (IEP) Module

- a. Annual Goals
- b. Short Term Objectives
- c. Task Analysis Record
- d. Formative & Summative Assessments
- e. Group Teaching Lesson Plan

4.0 Computer Assisted Instruction (CAI) Module

- a. Create Training Package
- b. Personalize Training Package (added Matching/Comprehension)
- c. Curriculum Based Measurement/Assessment (CBM) Module
- d. Create Quiz (Multiple Choice, Match the following, Sorting/Ordering)
- e. Personalize Quiz
- f. Creation of CAI lesson plan

5.0 Rendering & Evaluation Module (Child Environment)

- a. Learning-Fun & Learning

- b. Learning-Stories
- c. Learning-Quiz
- d. Entertainment-Games
- e. Entertainment-Videos
- f. Entertainment-YouTube
- g. Entertainment-Songs
- h. Text-To-Speech(TTS)
- i. Chat
- j. Whiteboard

6.0 Utility Support Module

- a. Picture Glossary
- b. Reinforcement Library
- c. Lesson/Exercise Repository
- d. Schedulers & Timetables with mobile support
- e. User Manuals

7.0 Decision Support System (DSS) Module:

- a. Lesson suggestion Based on IEP Goals
- b. IEP suggestion based on the child profile.

8.0 Collaboration Module

- a. Chat room can be created and chatting can happen between different users
- b. Internal e-mail Facility
- c. Whiteboard

I. CHILD LEARNING ENVIRONMENT

Child Learning environment supports clutter free, multimedia based learning for the child with special needs keeping in view the cognitive accessibility. Accordingly the environment comes with clutter free screen space, with easy navigation through voice guidance and the tool allows the user sufficient time to access and interact with the content. Lessons are supported with Text-To-Speech based prompts and multimedia based reinforcements.

a. Fun and Learning – It is a receptive way of teaching the child with Discrete Trials Training(DTT) methodology, where the personalization of training package appears date wise on a calendar spread on the screen in the child’s learning environment. The dates for which the training packages are available are highlighted in blue color, on moving the mouse on top of the date a tool tip will appear that displays the acquisition items that are personalized on a particular date (this is for teacher’s reference). The color of the learning environment can also be changed using the color choose option.

b. Quiz– List of quizzes will appear and 3 kinds of quizzes are available namely Multiple choice single answer, Match the following and Ordering/Sorting.

c. Stories, Games, Videos, Songs – The Stories, Games, Videos, and Songs that are personalised for the child appears under various tabs named Stories, Games, Videos, and Songs in the child environment.

d. Chat & Email – Chat facility is made available to the child using which the child can chat or exchange emails with parents and special educators under controlled settings.

e. Performance Report – Special educator can login and view the performance of the children in the child environment with their login credentials. The performance of the child is captured session wise, the time the child spent on each tab appears in the form of Pie chart along with the percentages.

III. SCREENS OF THE FRAMEWORK

I. ADMINISTRATION MODULE

This module allows the user to register the school from the link “New School Registration” present in the Home page. After the school is registered, using central administration login, school has to be enabled. After the school is enabled, other users with various roles like special Educator, Psychologies, parent etc., can be created and they in turn can perform various tasks like- adding the student, administering various assessment tools, based on assessments made creating training packages and assigning them to the student. These are the tasks that can be performed in the broad sense. This would be further elaborated as we explore the manual further.

A. New School Registration

A school registers to this web site using the New School Registration option from the main screen. On selecting New School Registration option from the login screen the display is as shown in Figure I. The user needs to enter the details of the school in the fields provided and create an Administration login by giving the Login name and password.

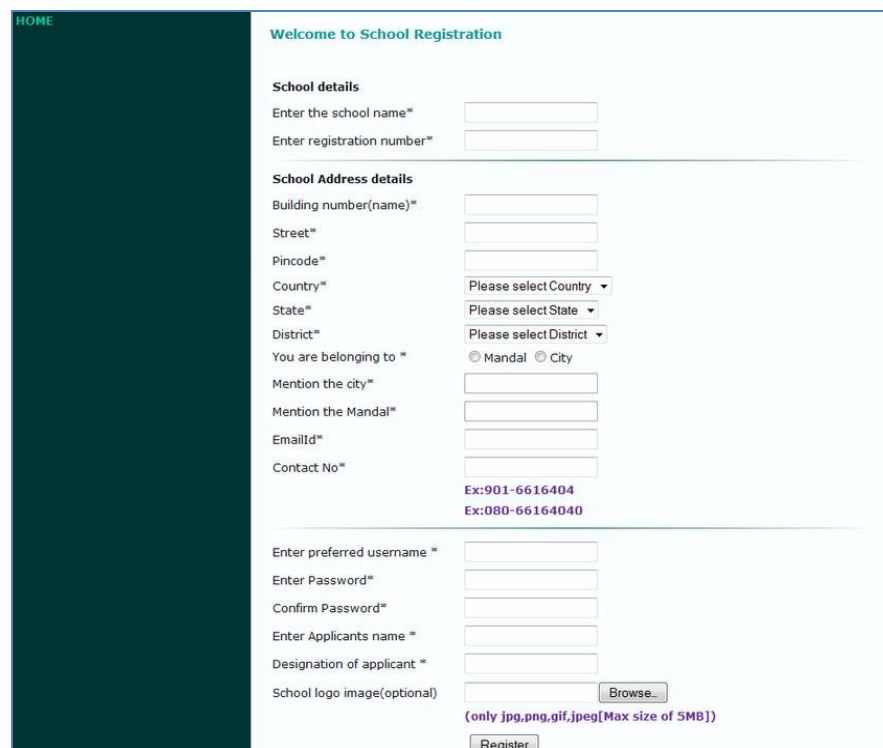


Figure I : New School Registration Screen

B. Administrator Interfaces

On creating the Administrator login the administrator needs to login to access the School Administrator modules. The School Admin screen is as displayed in Figure 3. This module allows the Administrator to add and update the user details, create and assign functional roles, enable and disable the users and to update school profile.



Figure 3 : School Admin Home page

School Admin can click on any tab of the side menu and proceed as shown in the figure 4 below:

C. Add Users

The Administrator starts adding the users for that school by keying in the data of the user and assigning the role to that user. The display for Add users is as shown in Figure 4. The personal, contact and address details of the user are keyed in.

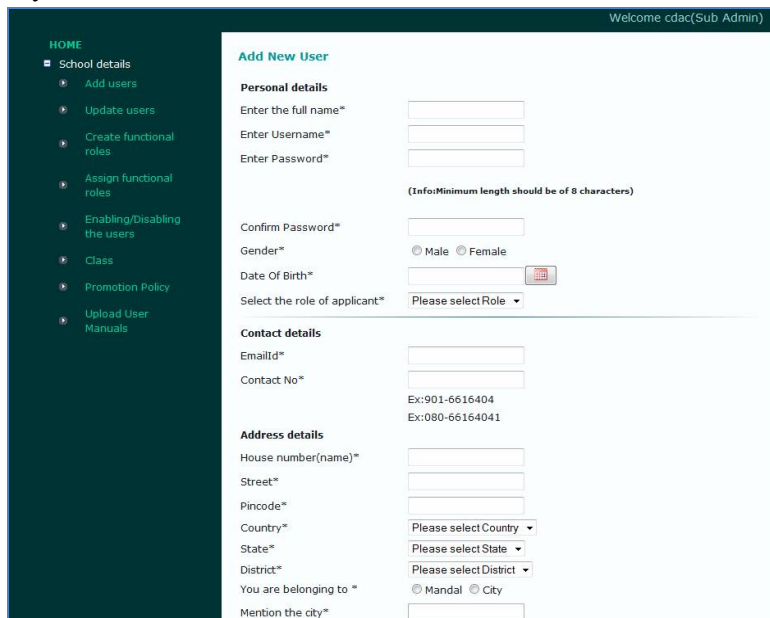


Figure 4 : School Details: Add Users

D. Create Functional Roles

There are broadly four main roles provided and the activities of each are as given below:

1. **Medical Officer** – Medical assessment(Case history) and Collaboration
2. **Special Educator** – General assessments/ Provisional Diagnosis/ Management Plan/ IEP Creation/ Task Analysis/ CAI Package Creations and Collaboration
3. **Psychologist**- Intellectual/ Psychological assessment(Case history) and Collaboration
4. **Clinical Assistant** – In charge of creation of Case Record Performa(Identification data/Demographic Data) and Collaboration

The option “Create Functional Roles”, allows the Administrator to add sub-features to the existing roles. A list of pre-defined sub-features is displayed. The administrator needs to select the sub-feature and click on the button ->then the highlighted sub-feature is copied to the <Selected Sub-feature list> and is assigned to the Role on selecting the Add option. To remove any Selected Sub-feature from the role, select the feature which needs to be removed from the <selected sub-feature list> click on the <- button. The display for Create Functional Roles is as shown in Figure 5.

E. Main Roles and Sub Roles:

The sub roles are the various roles under any Main role. Administrator can select more than one main role so that features available for all the selected roles will be listed down. He can merge the features available for multiple roles and create a new functional role. So that one user can have the multiple functionalities.

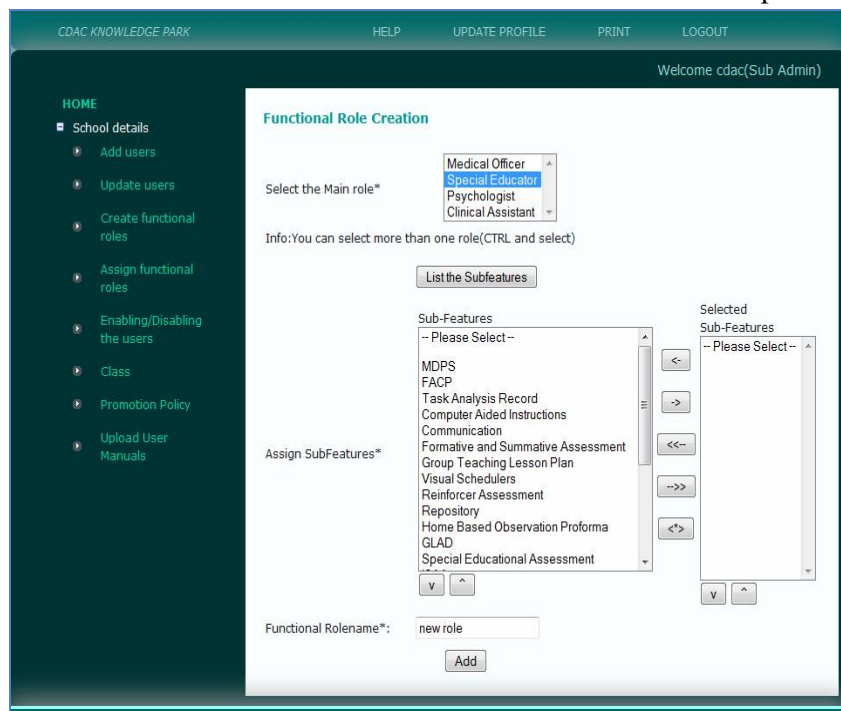


Figure 5: School Details: Create Functional Roles

F. Assign Functional Roles

This option allows the Administrator to assign various functional roles to the users. On selecting this option the display for is as shown in Figure 6.

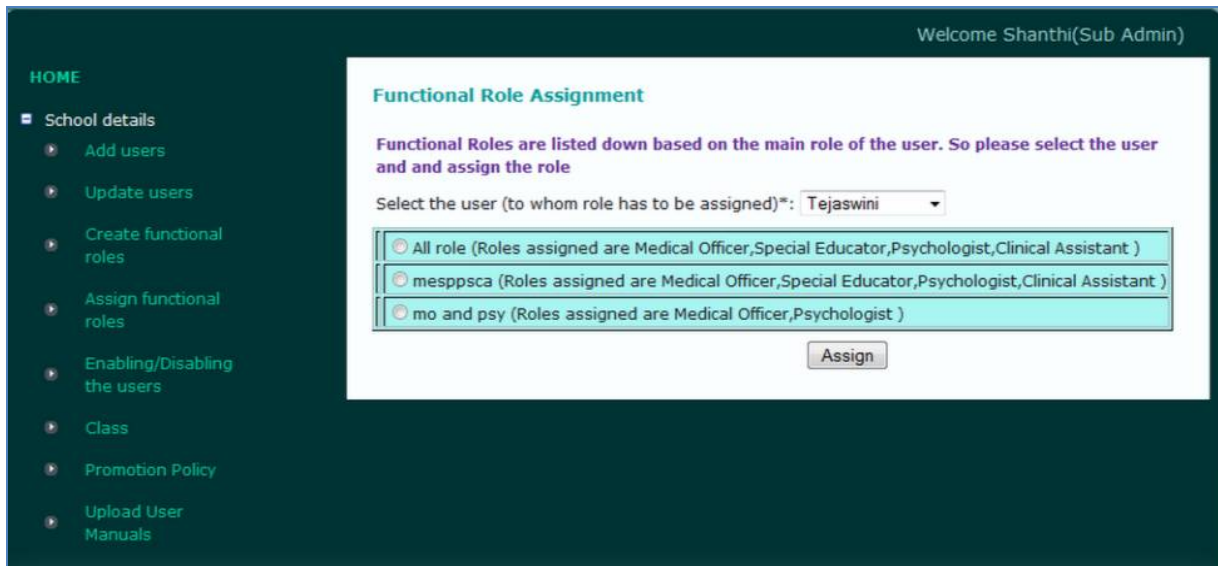


Figure 6: School Details: Assign Functional Roles

A. An awareness Web portal with local language support (in Telugu, Kannada, Hindi) has also been built which can be accessed from the URL: <http://learnwithme.cdacb.in/>

The Web portal is developed with various Tabs containing details on Intellectual Disability, Resources, References, FAQs etc. The web portal is serving as a helpline for parents and also as a platform for interaction among parents and help for Adult Autism Children.



Fig 7: Screen Shot - Web Portal- Resources