Computer-Based Assessment of Pre-assigned Individual Education Plans in Special Education

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Abstract—Assessment of IEP (Individual Education Plan) is an important stage in the area of special education. This paper deals with this problem by introducing computer software which process the data gathered from application of IEP. The software is intended to be used by special education institution in Turkey and allows assessment of school and family trainings. The software has a user friendly interface and its design includes graphical developer tools.

Keywords—Disabled individual, software for education, assessment of education, special education.

I. INTRODUCTION

ASSESSMENT of an IEP is very important for determining whether the progress has been satisfactory or not. Additionally, if the educator knows the strengths and weaknesses of a disabled person, he or she will be able to use this knowledge base to make adjustments for further stages of the program.

The use of computer based technologies for assessing individual plans certainly reduces educator time that would be spent for this purpose. On the other hand, information technologies minimize human errors in management, data entry and data processing. This would prevent the education plan from progressing inaccurately.

One of the most important assessment criteria in the education of disabled individual is to determine the time it takes to manage a behavior [1]. Another important factor is the collaboration between parent and school. The software that we introduce here has been designed to handle all major data acquisition stage and processing problems of assessing IEP in special education.

Since the main motivation is to provide assistance to educators, all interfaces in the software are designed to be graphical visual components are also extensively used. These design and implementation elements create a user friendly environment which renders the software easy to apply in a vast range of disability cases. Reporting capabilities are also available for producing assessment reports about the outcomes of an education plan. Reports can be prepared by the family, by the school and comparatively.

II. RELATED WORKS

Special education is a complex, individualized and

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lengthy process. For this reason, information technologies have been used extensively in this area, causing considerable improvements at various stages. Educational software and hardware elements are usually shaped by national educational systems or cultures. Scientific and technological developments in this area take place in many different countries all over the world.

J.L. Crawford and G.C. Young and R.C. Robbins discussed the use of computer and information technologies in special education [2],[3].

D.D. Kumar presented some innovate ways of science assessment using computer technology for students with learning difficulties [4]. G. McGain reported the results of a study on technology based assessment in special education [5]. These and many other works studied various aspects of using information technologies for program development and assessment.

J. Shriner and L. DeStefano compared individual and non-individual curriculum applications in special education [6]. C.Allman studied alternate assessment systems [7]. Some other related works can be found in [8]-[13].

Many computer software products have been developed and applied successfully in special education. Some examples are IEPPro, developed by Chalkware Education Solutions, ClassIEP program developed by Technical Perspectives Inc., and netIEP developed by Netchemis. [14]-[16].

The software that was presented in this study specficially deals with individuals whose education plans are already assessed. A distinguishing characteristic is that it is designed to be supportive rather than conductive.

III. ASSESSING AN INDIVIDUAL EDUCATION PLAN

The software handles the assessment of disabled individuals at three phases:

- Data acquisition from trainings
- Comparing the data with success criteria and determining satisfaction level of individuals.
- Displaying the results using graphical tools.

A. Data Acquisition from Trainings

This is the fundamental step in the assessment of an IEP. Data are recorded according to the format which is shown in Table I and stored in the master database. An educator can access this database anytime and retrieve necessary information for assessing the progress of an individual education plan. The database can also be used for administrative purposes. Note that, format structure of the fields reflects the category of objectives and behaviors.

World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:1, No:8, 2007

Behavior 5….play games hand in hand

TABLE I
DATA FORMAT FOR A BEHAVIOR TRAINING RESULT

Field Description	Field Type	Field Size (bytes)
Individual Student No	Integer	2
Educator Code	Integer	2
Date	Long	4
Time	Long	4
Objective Category	Integer	2
Objective Code	String	20
Behavior Code	String	10
School/Family	Boolean	1
Satisfaction	Boolean	1
Satisfaction Help	Integer	2

This structuring allows retrieving data from a specific category and performs assessment whenever needed. For example, it is possible to evaluate separately the social and communication skills for an autistic individual at an appropriate phase of training. Data from parent and school trainings are recorded separately, allowing different assessment for each category. This way, it would be possible to decide whether a disabled individual benefits more from parent or school trainings. The decision, in turn, would constitute a basis for modifying the plan in a certain direction.

Since accurate data entry is very important for later evaluatory works, a carefully designed data entry form is supplied for the user. A snapshot of the data entry form is given Fig. 1. The data that are collected through data entry form can easily be exported to other software or databases. This facilities support the use of collected data for other purposes.

Fig. 1 Data entry form

B. Comparing the Data with Success Criteria and Determining Success Levels of Individuals

The collected data for an individual should be evaluated according to the success criteria for the objectives of an IEP. This indicates that, an education plan for a specific individual should have a predefined set of objectives, behaviors and success criteria. An example is given below:

Objective…...Establishing physical contact
Behavior 1….gives permission to touch
Behavior 2….gives permission to caress his head
Behavior 3….gives permission to hold his hands
Behavior 4….holds someone's hands

As can be seen, this goal has five behaviors and success in four of the behaviors is considered to be satisfactory. Thus, the success criterion for this goal is determined to be 4/5. In order to classify an individual's results as satisfactory he or she is expected to complete the minimum number of behaviors of the goal and success criteria.

The software compares with the success criteria all the results obtained by a disabled person and determines to what extent the goals have seen achieved. Similar operations are performed for both parent and school and the results are inserted to a table for later use.

Another important point is the categorization of the goals for possible success standings of an individual. In other words, groupings are used to identify the goals that are most suitable for the education plan of an individual. Adjustments can be made in the plan in accordance with these groupings.

The software also performs computations concerning the types and effects of assistance received by an individual. An example set of the assistance types are shown in Table II.

TABLE II
TYPES OF ASSISTANCE

Code	Assistance description
1	Physical assistance
2	Acts as a model
3	Remarking assistance

The effects of a certain type of assistance on success can be computed from the stored data and its convenience for the individual can be determined.

C. Displaying the Results using Graphical Tools

The results of computations can be presented as lists or in graphical forms. The results for specific goals can be listed according to category and graphical displays can be formed for each category. It is also possible to display the objectives separately. Fig. 2 presents an example graphical demonstration for a plan.

The form has three pages. Page 1: The page for graphics. Page 2: The page for lists of objectives and behaviors. Page 3: The page for changing results according to categories. When the form is opened the results belonging to the first individual are displayed which contain the computations for all objectives and behaviors. The results can be obtained for family and school information separately.
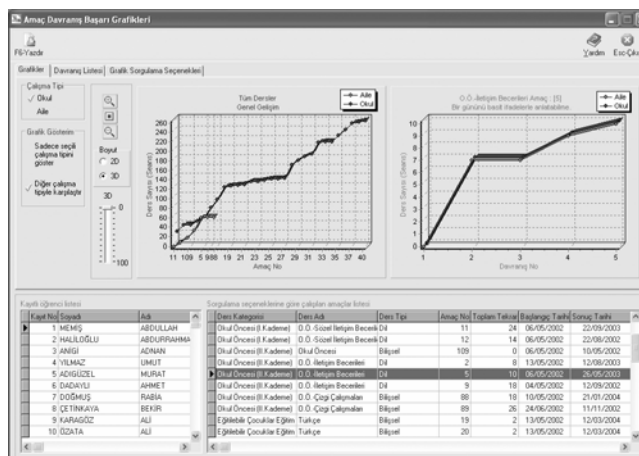

Fig. 2 Graphical demonstration form for assessment of school and parent individual education plans

World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:1, No:8, 2007

This form provides an important source in the assessment of the trainings for a disabled person, as the contents are objective findings. Displays are intended to support the educators and administration rather than to guide them.

The first graphic in Fig. 2 (left side) displays the success of the individual based on all trainings that have been received. One of the lines on the graph corresponds to parent and the other line corresponds to the school trainings. Some guidelines for interpreting graphics are given below:

- If the lines nearly parallel, family and school works are balanced.
- Smaller slopes indicate higher success levels.
- If the slope is infinity (i.e. parallel to y axis) the objective has not been achieved in a long time period
- If the slope is zero (i.e. parallel to x axis) more than one goals have been achieved in just a session.

If the number of parallel parts in graph are too many the education plan should be revised according to the findings.

The second graph in Fig. 2 corresponds to the behaviors for a certain goal. It provides information about objectives that are included in all trainings, but their success levels are low. The above mentioned guidelines are also valid for this graph.

In the section for listings (bottom) the data that constitute the basis for the graph are presented. From these data, it is possible to obtain the details for interpreting unexpected graphical shapes.

It is also possible to obtain monthly evaluation reports from the available data. An example is shown in Fig. 3, where reports include assessment results for the behaviors belonging to a month, alongside with personal data, educator and training method.

If the assessment for an individual indicates insufficiencies in parent trainings, the educator is warned by the software for arranging a meeting with the parent of student. Meeting details are also stored by the software in the database for further use at later stages.

Fig. 3 Montly assessment report of disabled individuals

IV. CONCLUSION

The use of software that exclusively deal with special education, helps educators, family and school managements to improve their work at every stage. The software we developed for this purpose, takes advantage of integrated database management and processing methodologies and graphical user interfaces. Accurate records can be collected, stored and processed by using the facilities provided by the software. The educators can concentrate their efforts on training rather than paperwork. Assessment of pre-assigned individual education plans are facilitated to a great extent and additional capabilities support the educator, in preparing reports and arranging details of education programs.

The software that has been presented was developed to satisfy the needs of special education institutions. So far feedbacks from various applications have been quite encouraging.

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