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The Use of Information Technologies in Special Education for Preparation of Individual Education Programs

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Abstract**—**In this presentation, we discuss the use of information technologies in the area of special education for teaching individuals with learning disabilities. Application software which was developed for this purpose is used to demonstrate the applicability of a database integrated information processing system to alleviate the burden of educators. The software allows the preparation of individualized education programs based on the predefined objectives, goals and behaviors.

Keywords**—**Special education, disabled individual, information technology, individual education programs.

I. Introduction

THE use of information technologies, Internet and World Wide Web in special education enable the education to benefit from the experience of the educators and researchers and to share the results with them. A good example is the preparation of individual education programs for teaching people with various types of learning difficulties. Such a program requires the determination of objectives, goals and behaviors for each individual based on the results of similar programs. In this work, we describe database integrated software and its use in the area of special education for individual education program development. The software utilizes available information and experiences to guide educators for improving the existing programs or developing new ones. The stored data includes objectives, goals, behaviors and information about disability groupings.

The software also allows the evaluation of individual education programs that have been applied to certain disability groups. Specific graphics help the educator to individually assess success levels of the individuals. In addition, prepared individual education programs can be applied by both educators and parents of individuals. The software can compare the results which may be obtained by educators or parents.

II. Related Works

The use of information technologies in special education is quite common and well accepted by families, educators and education authorities. Pioneering works in this area date back to early and mid 80s. For example, J.L. Crawford and G.C. Young and R.C. Robbins discussed the use of computer and information technologies in special education [1],[2]. W. Kiswarday proposed a compute camp for disabled individuals and their families and discussed the positive effects of computer technologies in personal development of such people [3].

In another work, E. de Graaf described computer software for assessing the progress of children with certain types of disabilities [4]. V. Krishnaswamy introduced a computer assisted training program for children with mental retardation [5]. There are many similar work in the literature that deal with the use of computers, computer software and computer assisted special education. Some representative examples can be found in [6]-[10].

Another group of work deals with particular application areas and the use of audio-visual information technologies in special education. Some examples are provided in [11]-[14]. Data analysis and individual program development aspects of special education have also been explored extensively in the literature [15],[16].

However, due to differences in national education systems and cultural diversities, applicability of the related technologies and software are usually confined to a specific country or region.

The computer software we present in this work can be used to prepare individual education programs for students and to plan measurements and to assess the progress. By using the results of teaching that are carried out at school and at home, new and improved versions of an individual program could be prepared for a certain individual.

III. Preparation of an Individual Education Program

An individual education program for a person with a certain disability should be based on the initial diagnosis. Therefore the set of objectives for a program are chosen in accordance with the initial diagnosis. At this stage, the objectives for a diagnosed individual are grouped for later explorations. For example, in order to improve verbal or non-verbal skills of autistic individuals, the objectives should be groped according to disability types of autistic persons.

In the software there are altogether 1300 goals and 12000 corresponding behavior definitions. These can be manipulated through user friendly interfaces. Adding or removing goals can be performed in accordance with the current standing of the student. It is also possible to change information about the behaviors and to alter some of the future contents that are part of the current program. Table I

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displays categories types, grouping and behaviors that the software handles.

TABLE I
BEHAVIOR CATEGORIES ACCORDING TO AGE, COURSE ETC.

Age (Child age)	Course Type	Education Type	Disabled Groups
Preschool (1st-2nd year)	General growth	General growth	Mental Retardation
Preschool (3rd-4th year	Preschool	Language	Mental Motor Retardation
Preschool (5th-6th year	Physical education	Fine motor	Down's syndrome
Elementary Education	Applied science education	Rough motor	Autistic
Middle School	Course of existence	Social skills	Cerebral Palsy
High School	Work education	Cognitive	Meningomiyorosel Sefali
Physiotherapy	Mathematic Music Drawing Social sciences education Traffic Communication skills Oral Communication skills Humand body and health Ecology	Self-care	Hidro Sefali Micro Sefali Epilephsi Spastic Dipleji

A. Definition of Objectives and their Behaviors

Since the main function of the software is to help educators in training and teaching individuals with disabilities, it is important to be able to defined specific set of objectives and behaviors for each individual. The database contains 1300 well-defined and officially approved objectives and 12000 behaviors. The database contents are quite versatile and flexible, which makes the software adaptable to the programs of different educators and education systems of different countries.

Defining objectives, goals and behaviors for a program are achieved by filling form as follows:

- Open a new form
- Enter the objective for the disability category based on personal information such as disability type, age, etc.
- Enter the corresponding behaviors for the objective
- Enter the success criteria for the objective.

Upon completion of the form, a new objective will be added automatically to the education program of the individual that is being educated.

Fig. 1 displays a screenshot of the form which is used to control objectives and behaviors. Since the objectives and behaviors can be subdivided into units, the educational program of a certain disability group can be formed by combining the units in accordance with the progress of the individual during his/her training.

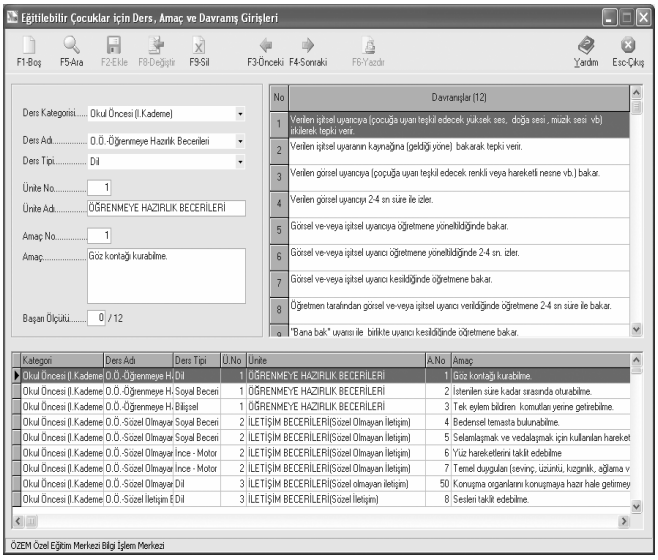


Fig. 1 Screenshot of the form for defining objectives and their behaviors

Additionally, it is possible to make alteration in the success criteria for a certain behavior. This prevents any vicious circles in training that would be caused by insistent failures of a student.

B. Uploading the Behaviors according to Diagnosis

When an application is made on behalf of a disabled individual, a fact finding process takes place and according to the results, the individual education program is determined. If the disability category for a specific person is known at this stage, many inapplicable alternatives can be eliminated. As an example, consider for autism: There will be no need for test involving hearing or physiotherapy for autistic individuals. Additionally, if the weakness of a disabled individual can be identified, it would be easier to make choices among the existing groupings in the table. This way, the goals and behaviors that will be added to a program can be determined more accurately.

Fig. 2 shows the form that is used to define individual education program for a disabled individual. Uploading the objectives and behaviors are performed by filling the form as follows:

- Enter the Id number for the student
- Enter personal information (Disability, group, age, etc.)
- Enter the training type

For example, if a six years old autistic child has to receive training in communication skills, the contents of his program can be obtained by filling the form as described. The software can also be used dynamically for making improvements in an individual education program. Fig. 3 shows an individual education program which is prepared for an autistic individual using uploading form.

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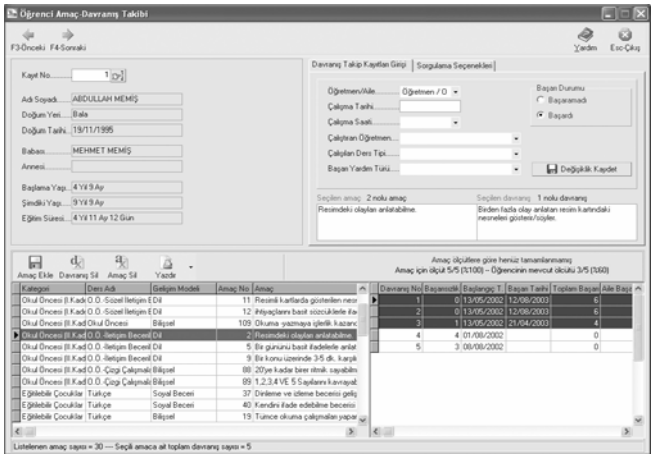


Fig. 2 Screenshot for uploading objectives and behaviors

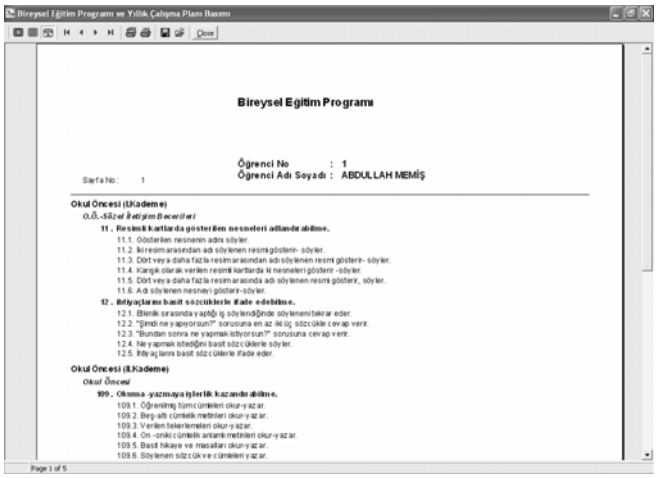


Fig. 3 An individual education plan for an autistic individual

C. Using the Software for Individual Follow-ups

An individual education program constitutes a work plan for a disabled student. Different subprograms can be formed for training behaviors at school and at home. Each individual subprogram includes calendar information so that time related evaluation can be made and the progress of a student can be assessed. For this work, plans are printed and handed out to both the educator and the parent of student. The results are collected and entered as inputs to the software, which carries out the final data processing work. The outcomes are indications of success or failure and a graphical display of training records.

IV. Conclusion

Application of the software for the preparation and evaluation of individual education programs have produced quite encouraging outcomes. Our software and similar ones reduce the administrative planning and the other paperwork. This way, the educators are freed from redundant works involving filling various student forms manually. The student work and progress are documented automatically according to the individual program. Data accuracy and timing are also additional benefits of using information technologies in this area.

Educators can now find and use more time on the education of the individuals. The whole process improves the quality of special education, increases teacher, family and administration's satisfaction. It has been observed that the benefits are especially noteworthy in institution with higher numbers of disabled individuals.

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