THEORETICAL GROUNDS OF CHOOSING AND DESIGNING SPECIAL SOFTWARE TO TEACH CHILDREN WITH MINOR MENTAL RETARDATION

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Abstract. The paper outlines some of the main theoretical aspects of choosing and designing special software to teach children with minor mental retardation in the context of the various strategies for choosing the contents and objectives of the curriculum. Furthermore the article aims at summarizing some the most important features of the software designed or adapted for the needs of special education practice.

Keywords: special education, special education software, children with mental retardation

The modern stage of technologies development offers a great variety of opportunities for their integration and application in education of people with special educational needs and learning disabilities. It also creates new context for teaching children with minor mental retardation problems. Using technologies in special education involves choosing and designing special educational software that supports teaching and learning. Some main aspects should be taken in consideration here. They refer to the adequate educational environment, teachers' professional training and competence, curriculum and syllabus design.

The challenge of teaching children with mental retardation

The special educational needs of children with mental retardation require special forms of learning and teaching. First of all, the teacher is asked to assess the pupil's educational needs in relation to the degree of mental retardation and then to draw up a special educational program, which will respond to his / her peculiarity. The aim is not the 'quantity' but the 'quality' of the knowledge and skills transmitted and the achievement of the learning objectives set by the teacher.

The aims and objectives of each teaching are closely related to the content of the curriculum. Apart from the functionality of the educational program, however, it is also desirable to seek to adapt the individual as much as possible to the rules

and demands of society. Therefore, there are various strategies for choosing the contents and objectives of the curriculum. These are:

● **Overall scoping of the curriculum**

According to this view, the central objective of special education is the pedagogical self-realization of social inclusion. Consequently, the child with mental retardation should be trained in the following areas:

a) Self-perception and confidence-building;

b) Self-service and self-protection;

c) Recognizing the position of the individual within the community and creating similar living conditions;

d) Orientation in social activities and participation in their organization;

e) Recognition and configuration of the world's material environment (Soulis, 2002).

The first two target areas are part of self-realization and the other three refer to social inclusion. Each target domain can be subdivided into other subordinates and ultimately creates a hierarchy of purposes.

● **Starting daily situations**

According to this strategy, everyday situations that children mental retardation will encounter in the present or the future will be sought. Then follows a process of counting and classifying them, and then attempts to categorize and define the learning objectives, which must be achieved for the particular situation. On the basis of the above-mentioned strategy, education is the appropriate equipment of the individual to deal with life situations and such basic life situations are those which:

a) Facilitate the return to life;

b) Help the person to become aware of my age changes;

c) Offer different experiences.

They are distinguished by their uniqueness. They help the person acquire specific abilities and skills. They are part of the pupils' school life (Soulis, 2002).

● **Starting the various scientific fields**

In this strategy an important role is played by the didactic and scientific dimensions of the various specialized fields. It is a combination of special pedagogical methods and the teaching of any specialized scientific discipline that leads to the acquisition of the respective qualifications by the student.

These are three strategies for the training of educational programs for children with mental retardation. Naturally, each of them has its advantages and disadvantages. However, the focus on implementing one of the above strategies should be the mentally retarded child with its peculiarities and special educational needs.

These educational needs require a specially-customized student-program that will be structured in the following core areas:

1. The field of academic knowledge (Language-Mathematics).
2. The field of social-communication skills.
3. The field of physical integrity-security.
4. The field of physical and mental health.
5. The field of professional skills (Soulis, 2002).

In summary, each teaching area refers to the following categories:

Academic knowledge

Language

In the area of the linguistic object are mentioned competences related to the oral and written speech (writing, reading) as well as alternative forms of communication (Sign Language, Listening, Braille) - (Soulis 2002). The development of spoken linguistic skills is necessary for the needs of communication but also for the internal organization of the thinking of pupils with mental retardation (especially light-moderate). In the classroom, but also in the day-to-day operation of the school, the aim is to enrich the verbal discourse with new vocabulary and syntax, active listening, participation in dialogue, logical and understandable organization of speech through roles and the expression of everyday and emotional needs and the wishes of the child. The development of production and understanding of oral and written skills is legitimate to be encouraged both within and outside the classroom (source Internet-analytical special education program).

Mathematics

In the context of the cultivation and development of mathematical competence, the aim is to acquire the knowledge and experience of mathematical concepts with mathematical concepts: numbering, layout, use of mathematical symbols and linking to their content, numerical operations, use of shapes, volumes, sizes, color recognition and measurement, time-space-volume concepts, and so on. In mathematical skills, the teacher needs to focus on every occasion and opportunity, as they relate to everyday practice and contribute to better adapting children to their social environment.

Social skills

To cope with a mentally disabled child in the wider social sphere, it must have sufficiently developed the social and individual elements of its personality. It is therefore necessary to have a stand-alone and self-reliant attitude towards everyday practices and social behavior that will allow it to respond successfully to and meet the demands of the environment. In particular, the child with mental retardation is called in this field to develop his / her interpersonal relationships. That is to deal with other people and to create and maintain friendly relations. This leads to their integration into the social context. In addition, the development of self-esteem-self-esteem is another important aspect of this field. This phase seeks to understand each person's uniqueness and acceptance of his personal abilities to

help determine the course of his life and give it meaningful meaning. Identifying each person's social role, value, and overcoming negative emotions mobilize social engagement and positive experiences. The development of social skills also includes the development of responsibility in the context of social behavior. Achieving appropriate responses to different circumstances, maintaining social relations, avoiding victimization, independence and decision-making, recognition of rights and obligations, recognition of personal responsibility in actions are crucial elements in conquering independent and secure living conditions.

Communication skills

These are developed in every teaching activity. Communication skills are directly related to the language field and refer to the familiarization with the various means of communication that facilitate daily contact (eg telephone, post, newspapers, various services, etc.). The cultivation of communication skills seeks to acquire a vocabulary that is necessary and necessary for speaking, listening, understanding and on the other hand creating opportunities for applying communicative practices to the daily act. Therefore, effective verbal and non-verbal communication, the ability to express one's own self-understanding are essential components of quality relationships in diverse social conditions.

Physical integrity and safety

It is particularly important for children with mental retardation to know and apply the basic safety rules. Indeed, it is essential for these rules to be taught at every possible opportunity and to respond to everyday practice and life. The safety rules refer to the «no risk» of living and behavior in the family, school, social environment, in all kinds of transactions, in the movement, in the professional space, etc.

Physical and mental health

Particularly important, without being self-evident, is to ensure good physical health in children with mental retardation. This area is given a special place in the teaching process when it comes to children living in an inappropriate family and social environment. The skills to be acquired relate to the individual care of the child (ie dressing-up, oral hygiene, toilet use, nutrition and clothing, appearance and systemisation on a daily basis), the management of the living space (ie care of clothes, cleanliness of the living space, meal preparation - nutrition organization, cleanliness, etc.) and its needs in the field of mental health (ie the organization of the mental world). The above skills should be taught at every opportunity presented and not as an individual teaching unit. They also aim at conquering the child's autonomy and self-serving without the help of the family when this is feasible.

Professional skills

Work for people with mental retardation is very important and is a basic right for them. Through work they gain respect and self-esteem, while being given the opportunity to access consumer, social or cultural goods. It is a means of autonomy,

while at the same time it has therapeutic value as it exploits their residual skills and abilities.

The area of professional competence development includes two levels of education:

1. Level of simple implementation of directives, cultivation of cooperation skills, keeping working hours, etc.

2. Level of pre-professional experience, professional experience, vocational education and orientation with the main aim of finding a profession, developing professional skills, developing experiences and habits with regard to professional behavior.

These are the above-mentioned basic areas of study in which the teaching program of children with mental retardation needs to be adapted to meet their specific educational needs. When identifying them it is necessary to consider whether they are adapted to their needs, interests, inclinations and peculiarities. In addition, they should respond to everyday practices and prepare the child for autonomous living. Besides, education is the right of every person on earth. This should provide equal opportunities and learning opportunities for all.

Teaching pupils with special educational needs is not an easy process and it is trying to contribute to various theories that have been developed in recent years and aim to integrate pupils into regular classrooms with the appropriate support to be able to develop both their learning and social skills. Especially for children with high functionality that the problems they face are of a social nature, this is an important process that ensures both learning and their social inclusion.

Special Software in education of people with minor mental retardation

The benefits of using new technologies to students with disabilities have been officially recognized by many countries. Students with learning disabilities, in particular, are facilitated by frequent, patient and pleasant repetition, with a multi-sensory approach to cognitive material and by providing patterns of desirable behavior. Students with physical weaknesses in coordination, vision, hearing, etc. It is possible, with specially adapted to their needs technological equipment, to gain gradual access to the common curriculum, which reduces the gap of equal opportunities. Children develop a sense of control and opportunities to interact with each other, feel proud of the excellent appearance of their work, learn to access information at the time they need it, and use the data constructively and scientifically (Kimball & Smith, 2007).

However, Assistive Technology does not help all students with disabilities in the same way, nor are there any magical recipes for everyone (Chou & Liu, 2005). That is why teachers who decide to use Assistive Technology as an assistant need to keep track of developments in the field, and learn how to test the various tools and related applications.

Through the use of computers, appropriate basic learning needs can be addressed by children with intellectual disabilities, such as need to provide a safe

learning environment, predictability of teaching activity, ensuring gradual passage from one level of learning to another, direct feedback, exploitation of the visual communication path, exoneration from the pressure it causes children (especially with developmental disorders), social interaction, personalized work etc. Therefore, research reports support their usefulness in the teaching of the particular student population (Whalen et al., 2006, Williams et al., 2002).

The above-mentioned conclusions have focused the interest of scientists on the creation and development of specific educational approaches through technology to enable students with intellectual disabilities and diffuse developmental disabilities to process the work under study in a clear and clearly defined environment, tailored to their particular needs and characteristics, such as the need for visual instruction, clarity of instruction and clear construction of the educational activity. There are some specific features that must be available for software suitable for use in the education of children with intellectual disabilities, such as:

With regard to Teaching Design - Pedagogical Approach the software should:

a) Offer the possibility of using through simple actions, the purpose and the goals that it serves to be realistic and can be applied to the educational act;

b) Allow adaptation of educational activities within the current curriculum;

c) Offer pupils the possibility of using multiple representations;

d) Provide the opportunity for constant and continuous feedback, necessary in the implementation of teaching in the particular student population;

e) Teach in a consistent and methodical way to allow the teaching to be taught based on the principle of Scaffolding. This is a basic strategy of constructivist learning in which learning is not a linear process, but a spiral composition of knowledge, ideas, values, attitudes and moods, which has a self-regulating character (Larkin, 2001).

In terms of content, the software must meet the following requirements:

a) The information contained is impartial, free from all kinds of stereotypes and biased messages, modern and in complete connection with the subject;

b) The subject should be appropriately adapted to the developmental and cognitive level of the students;

c) the structure of activities, the supply of information and the content of the exercises are governed by consistency and regularity throughout the software range.

As regards the support of the teacher, the software must be designed in a way so:

a) The material provided enables the teacher to plan the teaching activities on his / her own and adapt them to the individual needs of the student;

b) The activity scenarios are designed to allow the teacher to multidimensional use and pedagogical approach.

As regards technical excellence, the software must be:

a) Designed for ease of installation and uninstallation;

b) The options menu, the keys and the composite icons make their use very clear and the pupil's navigation is done with ease and ease;

c) The layout of the content has been designed to make the software operational, while the amount of information provided is such as to eliminate the risk of disorientation and distraction;

d) The quality of sound, images, photos and colors, as well as the sharpness of texts, follow the appropriate aesthetic rules while being designed to reduce the likelihood of sensory hypersensitivity.

In conclusion, Assistive Technology can effectively be used to integrate children with disabilities into the general school, provided of course that some basic rules are taken in consideration, such as:

1. To meet the requirements of modern research so that it is accessible to the user and responds to the learning style of the specific learning population to which it is addressed (Atkinson, 2004).

2. To be designed and built in a way that is compatible with the user's profile, thus offering the specifications for the maximum possible utilization of all its weaknesses, mental, motor, communication, etc. (Dix et al., 2004).

3. To rely on the use of the "strong" points posed by children with disabilities, which should be used in the teaching process.

The attempt to use Assistive Technology in the general class is also fully compatible with the practice of the School for All, whose aim is to ensure the maximum possible development of the capabilities of all students in a non-obstructive and constrained environment (Schleef, 2003).

Different technological solutions can be applied to help teaching and support the access to information and resources of people with special educational needs and learning disabilities such as: (1) special Internet browsers, (2) speech synthesizer, (3) tactile hardware devices; (4) specialized input and output devices, 5) telepathic interface, (6) Web based environments for teaching and learning etc. In this sense the digital competence of special educators and teachers is crucial for their professional profile. (Tsankov, 2011). The existence of ICT does not transform the importance of teachers' role in the educational process but it can enable them to transform and improve their teaching practices. On this basis, a general model of teachers' digital competence framework could be developed and presented regarding three different levels: administrative and organizational level, methodological level, personal career development level (Tsankov, Rangelova, 2010). Another important factor for successful special education and integration that can be supported by the special education software is the educational environment. We shouldn't forget that it must be open and supportive, inclusive, providing interaction between children not only in teaching and learning but also in their communication and co-operative work within the extracurricular work (Terziiska, 2014).

Using technologies and special software for teaching children with special educational needs and children with minor mental retardation in particular, involves: (1) careful and detailed planning of teaching technologies and resources

in the educational process, (2) adequate design of the educational environment, so it will be more motivating, stimulating and satisfying for the children, (3) conformity with the main educational principles, especially the ones connected with the individual approach, (4) impartial assessment of children's weaknesses and strengths and permanent support of their efforts, (5) joy and pleasure of the learning process, (6) various opportunities for social skills development, real life adaptation and realization.

REFERENCES

Atkinson, S. (2004). A comparison of pupil learning and achievement in computer aided learning and traditionally taught situations with special reference to cognitive style and gender issues. *Educational Psychology*, *24*(5), 659 – 679.

Chou, S. W. & Liu, C. H. (2005). Learning effectiveness in a Web-based virtual learning environment: a learner control perspective. *Journal of computer assisted learning*, 21(1), 65 – 76.

Dix, A., Finlay, J., Abowd, G. D. & Beale, R. (2004). *Human-Computer Interaction.* Madrid: Pearson Education Limited.

Kimball, J. W. & Smith, K. (2007). Crossing the bridge: From best practices to software packages. Focus on Autism and Other Developmental Disabilities, 22, 131 – 134.

Larkin, M. J. (2001). Providing support for student independence through scaffolded instruction. *Teaching Exceptional Children*, *34*(1), 30 – 34.

Schleef, L. (2003). Inclusive school communities: Accessible learning environments for all. *Closing the Gap*, 22(3), 1, 14 – 15.

Soulis, S. (2002). *Learning step by step at school and at home. Teaching strategies for children with moderate or severe mental retardation.* Athens: Print.

Whalen, C., Liden, L., Ingersoll, B., Dallaire, E. & Liden, S. (2006). Behavioral improvements associated with computer-assisted instruction for children with developmental disabilities. *The Journal of Speech and Language Pathology–Applied Behavior Analysis*, 1(1), 11 – 26.

Williams, C., Wright, B., Callaghan, G. & Coughlan, B. (2002). Do children with autism learn to read more readily by computer assisted instruction or traditional book methods? A pilot study. *Autism*, 6(1), 71 – 91.

Tsankov, N. & Y. Rangelova. (2010). *Information and communication technologies in foreign language teaching practice.* ICT in the education of the Balkan coutries. Chapter 5 ICT in the Process of Learning Humanities, Nature Sciences and Mathematical Disciplines. Balkan Society for Pedagogy and Education, Varna, 512 – 514.

Tsankov, N. (2011). *Conceptual and Methodological Framework for the Formation and Development of the Information Competence of Future Teachers – Scientific and Research Grounds*. International Conference "Information Technology and Development of Education – ITRO 2011". University of Novi Sad, Technical Faculty "Mihajlo Pupin", Zrenjanin, Republic of Serbia, 65 – 69.

Terziyska, P. (2014). Study of Educational Conditions for Inclusion of Children with SEN in Mainstream Education Environment. *Strategies for Policy in Science and Education,* Volume 22, Number 1, 29 – 37 (In Bulgarian).

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