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STRATEGIES OF METACOGNITIVE EDUCATIONAL UNDER THE CONDITIONS OF VISUALLY IMPAIRED

THESIS SUMMARY

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CHAPTER III - ORIGINAL CONTRIBUTIONS RESEARCH

Key words and phrases: *metacognition, visual impairment, educating metacognitive strategies, cognitive development, mediated learning, cognitive - structural modification, and dynamic evaluation.*

Introduction

The theme of this thesis is part of the current research trends ways of capitalizing the human intellectual potential. In the context of current transformations in the educational paradigm, it requires a growing need reconsideration purpose of education by moving from a traditional pedagogy (based on knowledge) to an interactive pedagogy (based on in-depth learning). It wants to invest with new roles to actors of the teaching process (teachers and educators), redefining the concept of learning, anchoring full and connect with current needs of the knowledge society, restructuring approach to knowledge in academic disciplines, with a focus on trans disciplinary approach and integrated learning based pedagogy shift to competency-based pedagogy targets.

To educate means overcoming the separation classics of fields of knowledge and reorganizing conceptual academic disciplines, so learning should not just assume somehow fixing and rendering of knowledge, but involve critical thinking, transfer, creativity, metacognition, the development of cognitive skills of students, teach them how to think, teach learning strategies to develop an effective, appropriate different ways of relations in various contexts. All these aspects are more suggestive of how we reiterate here the idea that the prediction ability to learn a relevant indicator represents a person's ability to work with information in new situations, different from those in which the learning, applying resolution strategies lead to resolution of the issue by using information gained individual experience.

The current pedagogy is based on effective learning achieved in the education bidirectional relationship; the student becomes an active part of their own training, engaging in a systematic and organized effort of learning.

The study of school population with disabilities cannot be achieved outside the new trends transforming the educational process concerns in this area focuses on the most appropriate ways of recovery / rehabilitation / reduction of the gap between actual and potential manifest.

PhD thesis titled "M*etacognitive strategies in terms of educating visually impaired*" is structured in three parts: the first part is allocated to theory and the other two parts are devoted to practical aspects of treatment - applied. We will do further exposure descriptive summary of such content.

CHAPTER I - THEORETICAL RESEARCH

Includes eight chapters that treat, over 146 pages, issues such as: ***cognitive development, learning experience mediated dynamic assessments, metacognition, general considerations on teaching and learning, Instrumental Enrichment Program, vision impairment.***

The paper begins with an ***Introduction to the Research and Presents the Relevance of the Research conducted and justification for choosing the theme***, the main arguments in this regard; we recall some difficulties that may arise from the formation of ”autonomy intellectual"

to students with and without disabilities. In schools for children with visual impairments are cases showing flaws in forming an "*intellectual autonomy*" due mainly to poor cognitive function. These shortcomings do not necessarily appear entirely as a consequence of poor cognitive functions of the individual characteristics, certain deficiencies occur as a given individual. There are frequent situations where learners who have visual impairments, because not guided by or to a result, difficulties in presenting without using adult data a problem, explaining the requirement of a year or once the problem solved, fail to interpret results or to establish multiple connections between the information they hold independently.

All these issues are all reasons that led to the choice of this research theme embodied in ***studying metacognitive strategy for achieving education for children with visual impairments***.

Potential applicability and practicality of this research is focused on finding the most appropriate ways conducive to promoting intellectual potential available to each individual (identification of learning ability and transfer) in order to reduce the distance between performance manifests intellectual potential real. At the same time, it wants demonstrate the leading role they hold metacognitive development strategies in math and reading activities, students with and without disabilities. Metacognitive development fosters the transfer of learning and has a positive influence on the subject, developing the ability to acquire more efficient working methods and to transfer them to new situations. (Wolfs, 1992) Therefore, the main anchor in reality and teaching the potential applications of this thesis is to get suggestive results demonstrating the possibilities for capitalizing real cognitive potential of students in general and students with disabilities in particular.

As an adequate analysis and clear the field under study involves an early stage, defining accurate notions and phrases used, we considered necessary and appropriate conceptual delimitation of the terminology used in the paper, realizing at the same time, and a brief treatment thereof.

Metacognition was defined by John H. Flavell as "*cognition about cognitive phenomena*" or simply "*thinking about thinking*" (Flavell, 1979, p. 906).

The strategy is defined by Popescu-Neveanu (1978, p. 685) as an action plan to achieve an orderly end.

Metacognitive strategy aimed at training the cognitive processes and mechanisms in order to foster those allowing the supervision, regulation and cognitive functioning knowledge systems own cognitive functioning (I. Manolache, 1998).

The operation aimed at practicing cognitive thinking assemblies operators.

Visual impairments include blindness and amblyopia. In blindness, the eye can not perceive the sensation of light. Amblyopia is delimited blindness (blindness) and designates all cases mitigation vision, regardless of etiology and severity, decreased vision after maintaining appropriate correction was made (Rozorea, 1997). Bangerter (1953) defines amblyopia as "diminishing vision without organic lesion or organ damage, the importance of which is not proportional to decreased vision" (as cited Rozorea, 1998, p. 21).

In section I.2. **Cognitive development** refers to the evolution of the concept of intelligence, being exposed to relevant theories of cognitive development: cognitive development theory of

Jean Piaget, theory sociocultural Lev Semyonovich Vîgotski, Theory of Multiple Intelligences of Howard Gardner's, Triarchic theory of intelligence of Robert Sternberg.

We resorted to approach the concept of intelligence by providing an image as "syncretic" the phenomenon. In an initial phase, we presented diverging views on the definition of intelligence, for example, Vernon (1960) classified the definitions of intelligence in biological, psychological and operational; Freeman (1962) defined differently depending on the concentration of intelligence on environmental adaptability, learning ability and aptitude for abstract thinking. Here are some definitions of intelligence:

- Binet and Simon (1905) "*to judge properly, correctly understand, react properly"*
- Terman (1921) "*aptitude for abstract thinking*"
- Burt (1955) "*general innate cognitive skills*".
- Estes (1982) "*Intelligence is a property of behavior determined by cognitive activity and motivational structures*".
- Vernon (1969) and Sternberg (1984) argued that any definition of intelligence must take into account *the cultural context in which it applies*.

Some psychologists (Binet, for example) defined intelligence in relation to the ability to solve IQ tests; intelligence tests assess what is, but while observing that this statement was absolutely incorrect.

There are also different views on hereditary or acquired intelligence and testing is one of the area's most controversial characters because of the dispute between the innate and acquired intelligence. A special space was intended exposure classic methods of measuring intelligence, which allowed us to see that ideas about what is intelligence varies greatly from one researcher to another, elaborating such a lot of theoretical approaches that have proposed to clarify the nature of intelligence passing the aptitude to identify the structure of intelligence (analytical approach factorial) to understand intelligence in terms of interactions between the cognitive system and other systems (systemic approach).

J. Piaget believes that the main function of intelligence is to ensure adaptation to the environment, the cognitive development of the individual is conditioned by its possibilities of *assimilation and accommodation* (Sternberg, 1996). Piaget's theory (1965) assimilation and accommodation possibilities can be defined by the notion of "*cognitive learning ability*".

In contrast to Piaget's approach, Vîgotski brings into question the role that environment plays in a child's intellectual development, the importance of reconsidering the interference of those better-informed child's cognitive development. Vîgotski promote *socio-cultural theory on cognitive development*, a theory which postulates the idea that children's cognitive tools are developed within the child-adult interaction, to be then internalized by the child. The knowledge and skills children develop because this process of cooperation involving "expert" and "novice" (Birch, 2000).

Another central idea in theory Vîgotski is *the zone of proximal development* (ZPD), that area of the current development of the child, the observed level of the child's ability (***performance***) and

the potential that can be purchased using adult or through other more experienced person, latent capacity is not obvious by direct observation (***competence***) (Sternberg, 1996). Vîgotski's conception of the nature zone of proximal development underpins all assessment methods dynamic intelligence and learning potential. (Szamoskozi, 1997)

Howard Gardner proposed ***the theory of multiple intelligences*** in 1983 that intelligence is not just a single building, unit, but has several facets as important. Gardner defines intelligence as the ability to solve problems or fashion products to be exploited in another cultural environment (Gardner & Hatch, 1989). Gardner's conception about intelligence is based on the idea that cognitive information processing system simultaneously uses information from multiple systems of symbols not at the same level of efficiency. This would be an explanation of the discrepancy between the performances of a person in different areas of activity.

Robert Sternberg developed ***the triarchic theory of intelligence*** that defines a complex relationship between intelligence and learning by using the concept of *transfer of learning*. Transfer of Knowledge or resolution on new contexts strategies by identifying the subject of the similarities of structure, an element of performance and intellectual competence. This concept being in the formative diagnostic methods. (Szamoskozi, 1997)

Mediated learning is the process of physical and social environment is mediated child by a competent person who enriches the interaction between child and environment elements that do not belong to the concrete situation, but part of a world of meanings and intentions derivation from a variety of values, attitudes, goals and means of transmitting culture (Feuerstein, 2000).

Feuerstein develop S-O-R formula proposed by Piaget, placing a human mediator between stimuli world body and its responses. The new formula is obtained for S-H-O-H-R mediated learning, where H is the human mediator. The mediator in the relationship between the body and the universe stimuli learn to interpret, guide and give them meaning. In such interaction, the learning is intended.

Mediated Learning Experience requires the presence of three parameters, which is subject to the mediator's deliberate attention: *intentionality and reciprocity; meaning mediation; transcendence*. These three factors are identified as factors responsible for modification structural - cognitive. Next to them, to ensure quality interaction mediated we add other new factors, as follows: *competence, self-regulation and control of behavior, participation, individualization, planning purposes, interesting challenges, mediation change: looking for new and complex, mediating perception human being as an entity subject to change, seek alternatives optimistic mediation, mediation sense of belonging*.

R. Feuerstein believes that "*intentionality and reciprocity are the main conditions for achieving mediated learning*" (Dunn et al, 2002, p. 10).

In the subsection entitled **Dynamic Assessment** assertions are recorded phrase, a comparative analysis between the static (psychometric) and dynamic and exposing the arguments made by Sternberg and Grigorenko, Tzuriel for dynamic evaluation. They then mapped the most significant dynamic testing approaches: Feuerstein's approach, his approach Budoff, Brown and Campione's approach, Sternberg and Grigorenko's approach.

The term *dynamic evaluation* is the assessment of thinking, perception, learning and problem solving through an active process of learning designed to amend cognitive functioning. Dynamic assessment of the two conceptions appeared on cognitive plasticity of human beings and the practical needs of finding the most appropriate and indicated dimensions diagnostics.

Sternberg and Grigorenko (2001) define dynamic evaluation as *test plus intervention*. To address formative assessment paradigm, have circulated a series of concepts synonymous as follows: testing / evaluation interactive, measurement zone of proximal development, testing / evaluation and testing assisted learning potential.

To capture the best advantage of using dynamic testing, we considered necessary to present the differences between paradigm static and dynamic evaluation and we appeal in this regard, exposure systematic arguments of Sternberg and Grigorenko (2001, p. 144 145): respective roles static versus dynamic processing approach, feed-back role in the two types of evaluations, quality-examined the relationship examiner.

Dynamic testing provides an excellent assessment of development expertise as committed all six components of the model of development expertise: metacognition, learning skills, thinking skills, knowledge, motivation, context (Sternberg and Grigorenko, 1998). Metacognition is involved in defining and redefining the problem; formulation and reformulation strategies as a result of the training; the problem representation as a result of the training.

Metacognition

We used a comprehensive approach to the concept of metacognition by: *reviewing the definition of that concept, presentation of the traditional and contemporary metacognition, describing the phrase "self-regulation learning", presenting strategies for self-learning in students, assessing metacognition, its development by educating metacognitive functions, exposure pedagogy methodological bases specific metacognitive.*

Research on metacognitive development were initiated in the early 1970s by Ann Brown, John H. Flavell and colleagues (see Brown, Bransford, Ferrara & Campione, 1983; Flavell, Miller & Miller, 1993; Schneider & Pressley, 1997).

Metacognition was defined by John H. Flavell as "*knowledge about cognitive phenomena*" or simply "*thinking about thinking*" (Flavell, 1979).

Schneider (2008, pp. 114.) considers that "*this concept refers to knowledge that people have about their own abilities to process information and knowledge about the nature of cognitive tasks and the strategies used to cope with such tasks. Moreover, it includes also the executive powers relating to monitoring and self-regulating their cognitive activities*. "

In literature, cognitivist psychologists have tried other definitions of the concept (ER Lai, 2011, p. 4-5):

- ✓ "*The knowledge and control that the child has of their own thought and learning activities*" (Cross & Paris, 1988, p. 131).
- ✓ "*A multidimensional set of general skills rather than specific to a particular field*" (Schraw, 1998).

- ✓ "*Awareness of their own thinking, awareness of the content of their concepts, active monitoring of their own cognitive processes in relation to learning and applying a set of heuristics such mechanisms effective, designed to help the individual to organize their own methods of attack / approach / solving problematic situations in general*" (Hennessey, 1999 p.3).
- ✓ *A form of executive control involving self-regulation and monitoring* (McLeod, 1997; Schneider & Lockl, 2002).
- ✓ "*Awareness and management of their own thinking* "(Kuhn & Dean, 2004 p.270).
- ✓ Sternberg (1986) *associated metacognition with school success and intelligence*.

If initially, metacognition, as a concept, emerged in the context of development research today is widely used in various areas of psychology, including motivation research, clinical and educational psychology.

Recent developments also include models of cognitive neuroscience in metacognition (Shimamura, 2000).

The traditional approach of metacognition. The components of metacognition

Flavell (1979) described two major aspects of metacognition, namely *metacognitive knowledge, metacognitive experiences or regulators (cognitive control strategies*).

Metacognitive knowledge relates to what individuals know about their own cognition / knowledge or about cognition / knowledge in general and includes knowledge or beliefs about what factors and variables act and interact to influence in some way the course and results of approach to knowledge. Knowledge metacognitive are knowledge variables "*person*," "*task*" and "*strategy*" and include knowledge itself from the position of learner, and factors that could influence the performance, knowledge about strategies and knowledge of the time (*when*?) and reason (*why*?) use of certain strategies.

We are talking about three types of metacognitive awareness: *declarative, procedural and conditional knowledge* (Brown, 1987; Jacobs and Paris, 1987).

a. *Declarative knowledge* refers to knowing "*about*" things.

Declarative knowledge includes knowledge about himself, as a student, and the factors impacting their performance.

b. *Procedural knowledge* refers to knowing "how" to do things.

Procedural knowledge refers to knowledge about development of skills / procedural skills. Individuals with a high degree of procedural knowledge using these capabilities to a higher level of automation (Stanovich, 1990), performed sequencing strategies (Pressley, Borkowski, and Schneider, 1987) and use different strategies to solve problems (Glaser and Chi, 1988; cited Schraw, G. & Moshman, D, 1995).

c. *Knowledge conditional* refers to knowing "*why*" and "when" can apply various cognitive actions (Garner, 1990; Lorch, Lorch & Klusewitz, 1993; cited Schraw, 1995). They can be regarded as declarative knowledge about the relative utility of cognitive procedures.

Flavell (1979, p. 907) believes the monitoring involves the interaction of cognitive processes 4 classes of phenomena: *metacognitive knowledge, metacognitive experiences, goals (or tasks) and actions (or strategies).*

Metacognitive control refers to the ability of an individual to do something or take measures to remedy when an error occurs. It involves also the ability to monitor progress in learning tasks, to sense and correct errors, to analyze the effectiveness of learning strategies used to change learning strategies when necessary (Ridley, Schutz, Glanz & Weinstein, 1992).

Adjusting knowledge (cognition) refers to metacognitive activities that help control their own thinking and learning.

Contemporary approach of metacognition

Flavell perspective about metacognition was complemented by Pressley, Borkowski & Schneider (1989), which proposed a model developed by metacognition model of good information processing (*Good Information Processing Model*), which not only took into account issues metacognitive knowledge related to procedural and declarative, but also linking these concepts to other characteristics of the successful processing of information. According to this model, **metacognition** is closely interrelated with: ***learning strategies and the use of automated processes for effective learning that the student uses motivational orientation, general knowledge about the world.*** (Schneider, 2008).

The latest conceptualization of metacognition added components, such as ***self-regulation skills*** (eg Schunk & Zimmerman, 1998; Efklides, 2001). Adjusting metacognitive knowledge is to monitor and includes planning activities, awareness and understanding of performing a task, process monitoring and evaluating the effectiveness of strategies.

Metacognitive typology can be divided into two categories synthetic metacognitive components: knowledge and knowledge about monitoring / regulation knowledge. *Knowledge about knowledge* refers to: (1) knowledge about their learning and about the factors that influence cognition; (2) awareness and knowledge management, including strategies and knowledge; (3) knowledge about who and when to use a particular strategy. *Monitoring / regulation knowledge* cover: (1) identification and selection of appropriate strategies and resource allocation,; (2) participation and awareness and understanding of the performance of a task; (3) assess their own learning processes and products; (4) reviewing and revising learning goals. (E. R. Lai, 2011, p. 7)

Adjusting knowledge (cognition)

In the last 30 years, learning concerns covered various areas, complex and comprehensive. In this regard, published papers devoted to *academic study* (Levin and Pressley, 1986), *meta knowledge* (Paris, 1987), *self-learning theories* (Zimmerman, 1990) *motivational influences in education* (Broply, 1999), *phenomenological aspects related learning* (McCombs & Marzano, 1990), *social and cultural influences from self-regulating learning* (Boekaerts 1998 Presslez, 1995), *monitoring reading* (Pressley & Ghatala 1990), *personal cognitive development* (Ferrari & Mahalingam, 1998) (Scott Paris & Alison G. H. Paris, 2001).

Self-regulation learning is conscious and controlled process, which allows students to direct and control their thoughts, behaviors and emotions to be successful in their learning experiences. Learning Self-regulation is a "construct" that includes issues such as cognitive strategies, metacognition, motivation, commitment to solve the task.

Self-regulation learning emphasizes autonomy and control of the person who monitors and adjusts lead actions in order to acquire information, resulting in increased expertise of the learner.

According to Zimmerman (2000, p.14), self-regulation learning "*refers to thoughts, feelings and self-generated actions that are planned and adapted cyclically personal goals*" (as cited Alison Scott G. Paris & Paris, 2001).

The cyclically popular of self-regulation learning, has three distinct phases: *planning, monitoring performance and reflecting experience* (Pintrich & Zuzho, 2002; Zimmerman, 2000). During the planning phase, students analyze specific task and set goals that will follow in order to achieve the learning task. The performance monitoring phase, students use strategies to advance the learning task and monitor the effectiveness of these strategies in achieving pregnancy. In the final phase, the reflection on performance, students assess your performance in terms of the learning task, analyzing the effectiveness of strategies chosen and followed. (S. Zumbrunn, J. Tadlock & E. D. Roberts, 2011).

To promote self-regulation learning in the classroom, teachers must teach students **specific strategies to facilitate their self-learning.** This process often includes tasks such as: *determining the goal, the following objectives* (Winne & Hadwin, 1998; Wolters, 1998), *planning* (Zimmerman, 2004; Zimmerman & Risemberg 1997), *self-motivation* (Corno, 1993; Wolters 2003; Zimmerman, 2004), *attention control* (Harnishferger, 1995; Kihl, 1985 Winne, 1995), appropriate use learning strategies (van Broek, Lorch, Linderhorm & Gustafson, 2001; Winne, 1995), self-monitoring (Butler & Winne, 1995; Carver & Scheier, 1990), seeking adequate relief (Butler, 1998; Ryan, Pintrich & Midglez, 2001) and self-assessment (Schraw & Moshman, 1995). (cited S. Zumbrunn, J. Tadlock & ED Roberts, 2011).

Assessment of metacognition - For what purpose? When? What? Tools? Educational Implications

Among the reasons that metacognition is advisable to be evaluated can be mentioned those of the E.R. Lai (2011): (1) metacognition is a complex construct; (2) metacognition is not directly - observable; (3) can be confused with metacognition abilities such as verbal and working memory ability.

Annemie Desoete (2008) believes that skills assessment metacognitive mathematical involves four components metacognitive: **prediction** (student thinks learning objectives, characteristics for effective learning and the time available), **planning** (student thinking in advance how, when and why to act to achieve the goal), **monitoring** (student selects appropriate capacities and adapt their behavior to the changing demands of business, realizing prior knowledge and selecting conduct appropriate study) and **evaluation** (student reflect on the result and understand the

problem, the adequacy of the plan, the solution found and the adequacy of the response offered in the context of the problem).

Metacognitive development - educating metacognitive functions

Assuming that metamemoria declarative children improve with age (Schneider & Lockl, 2002; Schneider & Pressley, 1997 cited ER Lai, 2011), there are three main functions of metacognition can be educated: functions knowledge functions procedural and executive functions (Flavell, 1979 as cited in SE Israel, 2007). The function of knowledge is to understand the functions and metacognitive strategies. Metacognition executive function refers to knowing when and how to execute (to perform) metacognitive strategies.

Metacognition procedural functions enable the reader to understand how to conduct effective strategies and then execute strategies without thinking.

In addition, knowledge of metacognition functions help placing metacognitive development levels in terms of the most appropriate teaching strategies. (S.E. Israel, 2007).

Using metacognitive strategies involved in reading

Metacognitive strategies used to facilitate understanding of reading are: planning strategies (*activating prior knowledge, information visualization of text), monitoring strategies (determining the meaning of words, questioning, monitoring, summarization, and search for important information*) and assessment strategies (*anticipation use knowledge, evaluation text*). (Pressley & Afflerbach, 1995) (as cited. SE Israel, 2007).

Pedagogy metacognitive

Metacognitive pedagogy rooted in current cognitive psychology. Late Piagetian school research has focused on aspects of operation or control mechanisms to describe disorders of cognitive development of the child. Metacognitive pedagogical intervention guidance focuses on cognitive processes or mechanisms involved in knowledge acquisition, considering the premise of improving cognitive functioning mental construction. The intervention aims to involve cognitive processes and mechanisms in order to foster those which allow monitoring and regulating the operation of the cognitive system.

I. Manolache (1998) opines that to help students, teachers should develop their metacognitive abilities, cause awareness of the students' knowledge processes, conditions and metacognitive processes by which they mastered the learning and work " learning to learn ".

General considerations on teaching and learning

Ionescu (2005) believes that *to teach* is to organize educational that produce desirable changes in student behavior: change produces the desired design; specify the nature of the change; determine the contents of such changes; organize, produce and monitor the production changes; assess the level is changing.

Teaching is considered so in terms of organization and management of the learning process and its consequent assimilation by students of a stock of knowledge, enrichment representations and notions their leadership of their independent monitoring and evaluation (We are talking about formative assessment, formative and continuous) (Ionescu, 2005).

Learning is understood as "intellectual and physical work, carried out systematically by students in order to acquire the necessary skills and training ideational content continuous development of personality" (M. Ionescu, 2000).
By B. McCarthy (1989), there are four learning styles (4 MAT System): the experience (involvement) by perception (observation, listening) through thinking (reflection, logical) experiments (learning by doing).
Teachers, especially psychologists have concluded learning as a result of teaching by putting the issue how to learn, which is the internal process of forming operations intellectual and motor skills, as employed mental processes in such phenomenon. Furthermore, they found that there is a sensory motor learning and conceptual learning and metacognitive learning (Radu Ionescu & 2004).

Instrumental Enrichment Program (I. E)

Feuerstein Instrumental Enrichment Program (IE) is a program for learning and metacognitive thinking through the mediation of cultural invariants. I E. was conceived by Reuven Feuerstein in order to give students new opportunities to drive in various learning experiences mediated by teacher
I.E. It has been used in over 50 countries, in many situations, such as programs to increase students' potential; inclusion of all children in classroom activities; remedial programs for children with special needs; Cognitive rehabilitation of brain affected by brain micro lesions; Study programs for immigrants and minorities; Instrumental Enrichment programs for talented children, but also for ordinary people; training and retraining programs in sectors such as industry, military, business.
Instrumental enrichment program is presented in four versions, in several languages: Basic, Standard, Braille and Adult Braille, the first two are used for school-age children.
As for pedagogical support program of enrichment tool, it consists of 14 instruments that comprise tasks and problems that the student solve in order to learn from them and acquire skills metacognitive: organization points, spatial orientation, spatial orientation, perception analytical comparisons, classifications, illustrations, family relationships, temporal relationships serial number, instructions, transitive relations, syllogisms, overlapping planes.
The major goal of the program is cognitive modification subjects and investing them with tools to be able to learn themselves.

Visually impaired

Cognitive development in terms sighted

In the literature some authors support the idea that cognitive skills are likely to grow more slowly or in a different way to visually impaired children than those without visual impairments. Bishop (1996), for example, believes that the most notable delay in the development of children with visual impairments is the motor areas, followed by delays in the development of cognition (in the case of severe visual impairment).

Cognition includes many areas such as training concepts about the world and objects, memory, thinking, problem solving and creativity. Severe vision loss involves general restrictions, each of which effects the development of cognition: the variety of experiences, the ability to control the environment, the ability to self in the environment.

In ontogenesis, “object permanence " is usually the first sign of intelligence development, while being a visual capacity. As a consequence of this situation, while limiting the visual function of difficulties in determining the cause and effect of events - "what happens when ...”

Cognitive factors such as classification, conservation, comparison, correspondence one - on - one, are also core elements in the formation of the concepts, critical areas that are to be learned.

In forming concepts, vision plays an important role by motivational functions, stimulating and inclusive. In terms of blindness, a child may have great difficulty in perceiving using tactile - kinesthetic and other senses an object in its entirety. (Preda, 1993)

Referring to the development concepts, Bishop (1996), Chapman & Stone (1989) noted that this is the most affected area cognition in people with visual impairments, cognitive concepts form the basis for development. Damage to this area is due to the lack of vision or decrease the quantity and quality of visual experience and factors which act indirectly, that feeling of insecurity, fear the independent exploration of the environment. Intervenes here utility developed by initiating early intervention family support specialists, parents become co-therapists in recovering their children from the earliest years of life.

Visually impaired child builds concepts about the world in a different way, he followed the same sequence in cognitive development as seers but at a slower pace, being different and the way they are shown a series of cognitive abilities. They are more dependent on information of "second-hand" needed intercession access to the surrounding world, helped by adult or another competent person. Therefore verbal descriptions of objects and experiences must be very clear and precise.

Barraga (1974) argues that without vision, many concepts cannot develop without the intervention strategies planned by the teacher to combine experience "first hand" in exploring objects with verbalization of issues that cannot be perceived visually (as cited Chapman & Stone, 1989). Scott (1982) describes the astonishment that visually impaired children living in concept formation, likening the experience to an "*unexpected black hole*".

To avoid confusion arising in the process of forming concepts is recommended as a natural framework and that certain steps that the student will go through (Preda, 1993).

Theories of development using Instrumental Enrichment Programs adapted to different categories of deficiencies, insists that children learn and develop their intelligence under the impact of intensified teaching strategies, formative and stimulating. R. Feuerstein stresses the importance of careful analysis of "cognitive maps" pointing out the reasons of failures and supporting points of formative and corrective-compensatory approaches. Also, great importance is the knowledge of cognitive deficit precise and efficient for intervention. Deficient cognitive functions can be analyzed by mode of manifestation in the three phases of the mental act: (a)

input (peripheral phase); (b) preparation, processing (core mental act); (c) output (peripheral phase).

Intelligence assessment in people with visual impairments

According to **Warren**'s opinion (1994 there are 5 approaches to the application of intelligence tests in people with visual impairment, as follows: (1) Using **verbal test WISC scales**, while the scales of performance are excluded because they contain visual items; (2) **The Stanford-Binet test adaptations** specifically for visually impaired children (eg **Perkins-Binet** test) (Davis, 1980, cited in Warren, 1994); (3) Evaluation performance aspects of intelligence through: adaptation **tactile cube Kohs** (Watron, 1956) and ***Kohs tactile Block Design Intelligence Test for Blind*** (Ohwaki, 1960); (4) Blind Learning Aptitude Test (***BLAT***) - learning aptitude test for the Blind (Newland, 1964, 1979); (5) Intelligence Test for Visually Impaired Children (**ITVIC**) (Dekker, Drenth, Zaal & Koole, 1990; Dekker, Drenth & Zaal, 1991; Dekker, Koole, 1992) The test comprises scale verbal and performance (tactile) and it represents the most comprehensive approach because: is based on factors theory of Thurstone, describes several facets of intelligence, is valid and is oriented towards rehabilitation.

The relevance of Instrumental Enrichment Program for persons with visual impairment

For a long time, Instrumental Enrichment Program remained inaccessible to blind people solely because of the nature of visual tasks. The blind were limited in graphics program operation inputs and thus fail to respond by drawing marks or figures. Gouzman (1997) created a tactile version of the materials included in the program by printing on a special paper with micro-capsules. Page so adapted to contain lines, texts in Braille and other graphics that are printed so that they become accessible for tactile examination. The problem of providing response was also solved by placing the paper with micro-capsules magnetic tables, provided that subjects signal by ferromagnetic answers.

By adapting and using Instrumental Enrichment Program, Gouzman, R., & Kozulin, A. (1998) succeeded in developing a series of poor cognitive function.

The learning conditions in blindness

The learning for a child with blindness wants the same stage as when the child without visual impairment, provided the use of private coping mechanisms for gathering information from the environment.

Besides the difficulty of receiving information from the environment are complete, Guinea (1985) recalls three significant features of the learning process of the child blind: 1) analytic perception of reality. 2) A delay in learning acquiring 3) Temporary obstacles in Learning, through imitation.

When we talk about educational process in children with visual impairments include here and specific ways of teaching - learning, so learning the special conditions can be successfully achieved by adapting teaching style by teachers and given a number of factors such as: location, presentation, experience, Expectations, Providing information, speed. (Chapman & Stone, 1998).

Students with blindness and low vision at the without other associated disabilities can receive the same education as student with normal vision and necessary adaptations of some of activities, resources and teaching materials for the success of understanding and knowledge of the integration into a normal social environment.
Best (1995) considers the need to include in the curriculum for children with blindness following aspects education: the senses; Visual stimulation; Orientation in space and mobility; Knowledge of specific techniques and tools; the abilities of individuals' personal autonomy.
Specific strategies of education for visually impaired can be systematized in the sense of Ştefan (2000) as follows: (1) adequate correlation between the activity of perception and the logic-verbal (2) Adapt the material conditions of the learning needs of their visually impaired ; (3) concentration strategy; (4) strict and rigorous grading individualization and (5) Ensuring the stability of cognitive acquisitions.

CHAPTER II - Current Status of the field. REVIEW of the most relevant research in this field. META-ANALYSIS STUDY

The second chapter of this paper marks the start of the practical part. It will be reviewed relevant research undertaken in the top and will perform a meta-analysis study, based on these studies.
The fundamental question of the meta-analysis study: *There are differences in the intelligence operation to blind people, partially sighted and people without visually impairment? If so, what are they*?

Research methods

This meta-analysis study was based a series of studies that have used the following research methods:
1. *Test WISC - Wechsler Intelligence Scale for Children*
2. Blind Learning Aptitude Test (BLAT) - learning aptitude test for the blind developed by Newland.
3. *Intelligence Test for Visually Impaired Children* (ITVIC) developed by Dekker and colleagues (Dekker, Drenth, Zaal & Koole, 1990; Dekker, Drenth & Zaal, 1991; Dekker, Koole, 1992).
4. *Kohs tactile Block Design Intelligence Test for Blind* assesses aspects of performance of intelligence adapting Kohs tactile cube. The test was adapted by Watron in 1956.

Preliminary Research

I considered necessary and appropriate exposure of the main research conducted among blind people using verbal and performance tests to assess intelligence.
Studies using non-verbal tests and determination verbal IQ the children with visual impairments.
The most commonly used tests to assess verbal IQ to blind persons are Hayes - Binet test and WISC (verbal).
We present some research in the field that led to the study of meta-analysis:
- The study by Gilbert & Rubin, 1965

- Study undertaken by Hopkins & McGuire, 1967
- The study by Tilman, 1967
- Studies conducted by Coveni, 1972
- The study by M.J.C. Mommers & B.W.G.M. Smits during 1970-1972
- Study of Teare & Thomson, 1982
- Studies conducted by Mason, 1992
- The study by R. Dekker, P.J.D. Drenth, J.N. Zaal and F.D. Koole 1990
- Studies conducted by Dekker et al., 1991

Research Objectives

Based on the analysis of field research, above, meta-analytic study has the following objectives (C. Borca, 2008 b):

♦ Determine the possible differences between intelligence of blind children and intelligence of healthy children.

♦ Comparison of effect size between intelligence test scores and acquisitions ITVIC school subjects obtained by blind children and visually impaired children.

Research hypotheses

1. *No significant differences between the intelligence of blind persons and persons without visually impaired*
2. *ITVIC intelligence test scores correlate better with school purchases of children with low vision than those obtained by the blind*

Verification of first hypothesis

No significant differences between the intelligence of blind and persons without visually impaired

Statistical approach that we call is the Meta-analysis - comparing the following three studies.

- *Study 1 - Tilman 1967*
- *Study 2 - M.J.C. Mommers & B.W.G.M. Smits, 1970*
- *Study 3 - M.J.C. Mommers & B.W.G.M. Smits, 1972*

After *variation of the effect size* was calculated for each of the three studies and analyzed to test heterogeneity of studies, we can conclude saying that no significant differences between the intelligence of blind and persons without visually impaired. Studies show there is a difference between intelligence sensitive to those children with blindness and valid deficiency due but not specific individual characteristics of subjects.

So the intellectual development of children with visual impairments is and should be considered normal. If evaluation is done with verbal tests, as was the case this analysis, there are no differences in relation to the child without vision impairment. Low results appear in samples of

performance, if are applicable spatial items and do not adapt to the needs of children with blindness.

However, if no significant differences compared to normal, then how do you explain that in most cases students with visual impairments have diminished school performance compared to peers without visual impairments? These differences are not significant, but they do exist and could be the possible causes: difficult access to material support / ancillary subjects, programs overloaded, insufficient development prosthetic visual disorders, slow learning, etc. But perhaps the most common cause is the use of inappropriate methods of working class (in some cases), the remote possibility of transferring knowledge. Against this background, there need to implement education programs in schools for children with cognitive sighted and transferring the interest of each student's personal development by adapting and individualizing intervention.

Verification of the two hypotheses

ITVIC intelligence test scores correlate better with school purchases of children with low vision than those obtained by the blind

From the values of correlation coefficients we compared the effect size by setting transformants zr_1 and zr_2 and value calculation of z associated with a significance level. We can say that there are no significant differences between the two effect sizes, respectively r_1 and r_2 corresponding acquisition of comparing school reading and understanding ITVIC independent variable test - verbal analogies.

After verification of the second hypotheses, we can say that this is partially confirmed: from a number of seven comparisons of effect sizes were significant differences only for two of them (visual items).Fact explained if we consider the nature of blindness and its implications at the level of perception.

CHAPTER III - ORIGINAL CONTRIBUTIONS OF RESEARCH

The pilot study - *Cognitive and structural modification in the conditions of a visual impairment*

Research Methodology

Research hypotheses

To highlight more clearly the mechanisms of structural and cognitive modifications in mediated learning situations in children with visual impairments, valuing latent intellectual potential through dynamic assessment and implications sighted in how they operate with the information visually and processed in the imaging mental the following assumptions in research were established (Borca, C., 2007):

1. *Subjects in the experimental group will get significantly better transfer coefficient of relative subjects in the control group, as a result of going through formative phase.*
2. *Subjects in the experimental group achieved a high coefficient of learning, due to the use of a minimum quantity of aid*.

3. *The rhythm of learning influences the values of the transfer coefficient and learning coefficient obtained by the subjects in the experimental group.*
4. *The results of the two groups of subjects are influenced by the level of visually impaired.*

Research Objectives

O1: *Setting transfer coefficient values in the control group and the experimental group.*
O2: *Determining the learning coefficient for the subjects they progress through the learning phase.*
O3: *Determination the learning rate available to the subjects in the formation phase.*
O4: *Identification of possible links between level of visually impaired and results of research obtain by the subjects.*

Research design - formative approach

The formative approach that included instances of pretest, intervention and posttest, a special role in highlighting issues that concern us, is to establish experimental variables.
Independent experimental variables are: intelligence quotient (IQ), the subject's age, the level of visually impaired.
Experimental dependent variables are: transfer coefficient (T), learning coefficient (L), rhythm of learning (R), type and number of aid granted.

Stages of research pilot study

This research was conducted following steps
Phase I: ***Psychometric phase***
IQ level was established by WISC sample application (verbal and performance) so that the 80 students examined, 60 were selected as features are within the target group.
Phase II: ***Dynamic assessment phase***
Formative diagnosis went according paradigm dynamic test by implementing the following algorithm: pre-test, intervention, post-test. He worked with experimental and one control.
After learning phase (intervention) were calculated following numerical indicators of cognitive profile: transfer coefficient (T), learning coefficient (L), rhythm of learning (R), type and number of aid granted.

Presentation of samples

Sampling was done non-randomly, depending on the criteria represented by: age subjects, the level of visually impaired and IQ. The target group of the survey was represented by subjects who have an IQ between 65 and 85 located, aged 7-11 years old, female and male.
The experiment was attended by 60 students of High School "IRIS" in Timisoara, demographic characteristics expressed above. The 60 children were grouped into two homogeneous groups of 30 subjects each - the experimental group and the control group.

Research methods

In selecting subjects with an IQ of between 65 and 85 was applied in the initial phase of global intelligence test WISC. It was followed by formative test sample application Stencil, which was

conducted in three phases of formative approach: pretest, training / intervention / learning, post-test.

Verification of first hypothesis

Subjects in the experimental group will get significantly better transfer coefficient of relative subjects in the control group, as a result of going through formative phase.

In order to verify the first assumption, we calculated the value of the transfer coefficient for each case in the experimental group and the control group, and then comparing the results obtained for the two samples of subjects.

Table II.5: *Comparison transfer coefficient values of the two groups*

One-Simple Test

	t	df	Sig. (2-tiled)	Mean difference
CT1	12,83	29	,00	,60
CT2	4,87	29	,00	,16

Specific hypothesis is confirmed, therefore, *subjects in the experimental group will get significantly better transfer coefficient of relative subjects in the control group, as a result of going through formative phase.*

Verification of the second experimental hypotheses

Subjects in the experimental group achieved a high coefficient of learning, due to the use of a minimum quantity of aid.

To check the second hypothesis of the research, we use variables learning coefficient (L) and volume of aid.

Statistical approach involved: calculation of statistical indicators for two variables and Pearson correlation coefficient. At a significance level of .05, the correlation coefficient r = - 0.35, which means that there is an inverse relation, medium strength, between learning quotient and size of the grant. Therefore, a high learning factor is accompanied by a small number of aids, while one fell large numbers of aid.

Subjects with visual impairments who have a high coefficient of learning require a little help to solve a problem. On the other hand, the subjects who took an average materialized with a high volume of aid, have a coefficient of learning decreased leading to the depiction ineffective after aid unduly granted by an adult, gross cognitive child to be reduced.

Statistical results, the above presented and interpreted, causes us to confirm second specific hypothesis, therefore, subjects in the experimental group achieved a coefficient higher learning due to the use of a minimum amount of aid.

Verification of the third experimental hypotheses

The rhythm of learning influences the values of the transfer coefficient and learning coefficient obtained by the subjects in the experimental group.

For the testing of the three cases were described first statistical index of start followed by correlational study of the values of the following variables: rhythm of learning transfer coefficient and rate of learning.

Statistics show that between learning pace and transfer coefficient, at a significance level of .045, there is a link directly proportional medium strength which would read as follows: individuals who have a high learning factor, benefit from a faster pace of learning. If the learning rate decreases will transfer coefficient decreases. The relationship between learning rhythm and the rate of learning is more obvious than the previous, so the value of the correlation coefficient r = 0.75 and a significance level of .05, there is a direct link between the two strong strength variables that make up a learning coefficient corresponds to a faster rhythm of learning and a low learning coefficient slow pace of learning. Thus, subjects whose learning coefficient is high, learns quickly, and those who have a low coefficient of slow learners learning.

In those circumstances, the third hypothesis is confirmed; *the rhythm of learning influences the values of the transfer coefficient and learning coefficient obtained by the subjects in the experimental group.*

Verification of the fourth experimental hypotheses

The results of the two groups of subjects are influenced by the level of visually impaired.

Check the latest assumptions of the pilot study was conducted through a correlational study of variables transfer coefficient, coefficient of learning, learning rhythm and level of visually impaired for both groups included in the experiment.

Following the study correlational between the level of visually impaired and three numerical indicators of cognitive profile: coefficient transfer, learning coefficient and rhythm of learning, it can be said that the level of visually impaired not influence the subjects' ability to use the information at their disposal in new situations, on the other hand, those partially sighted do not learn at a pace slower or faster due to deficiency as such, but because of individual characteristics embodied in: IQ level, ways of solving the problems, previous experience, specific processes retrieval.

It also notes a lack of connection between the two variables because of high materiality, which takes the value of 0.49 giving a very high probability of error when interpreting statistics. Consequently, it cannot accurately determine if the results transfer coefficient obtained by the subjects in the control group are not influenced or degree deficiency seen.

So, the hypothesis number four is disproved.

Study no. 3 – Metacognition and mediated learning

The premise starts this study *is that metacognition influence cognitive development and potential adaptation and modification of the individual in relation to his own direct experience of learning.*

The sample research

This study seeks to capture the view of the **240 teachers** who work with students with and without disabilities on ***the peculiarities of metacognitive skills training in school***.

Percentage distribution of teachers in the two forms of education: 56.67% of survey participants come from the mainstream school, 40% from special school and 3.33% in integrated special education.

Participants in the study are included in the following categories of teaching positions: 25% for pre-school teachers, 25% are teachers for primary, 18.33% of them are teachers - psychologists (special education), and 13.33% are secondary school teachers (mainstream and special education) and the remainder in equal proportions, itinerant teacher educators and teachers in special education.

As for the level of expertise of teachers, almost half of them (48.33%), didactic grade I, didactic grade II were 21.67%, 23.33% had definitely grade and 6.67% are debutant teachers in teaching career.

Method

Was used *Assessment Scale Mediated Learning Experience*. Tools developed by adapting Assessment Scale Mediated Learning Experience developed by Marilyn Dunn et al in 1996 (see Annex no. 1).

The scale includes 10 dimensions, operationalized through sets of actions and behaviors encountered in educative instructions. The ten dimensions correspond to specific parameters of mediated learning: *intentionality and reciprocity; meaning mediation; transcendence; competence; self-regulation and control of behavior, participation, individualization; planning purposes; interesting challenge; auto changing.*

The hypotheses of the study

1: *If the level of expertise of teachers is greater, then they have recourse more frequently in classroom activities, to the principles / parameters mediated learning*

2: *Mediated learning principles are manifested more in special education than in mainstream education and special integrated education.*

Verification of the first hypothesis

If the level of expertise of teachers is greater, then they have recourse more frequently in classroom activities, to the principles / parameters mediated learning.

To check this first hypothesis, we used statistical processing of the answers given by respondent's questions structured assessment scale, according to the **10 parameters** *Mediated Learning Experience.*

INTENTIONALITY AND RECIPROCITY

We find that 5% from 6.67% debutante teachers (meaning 74.96%) always causes increased interest and motivation of students, compared with 31.67% teachers with didactic grade I, 48.33% of the total (represents 65.52%). Situations similar meaning, in terms of the share of responses.

A similar situation is recorded for the item *Encourage the student to ask questions relevant to the subject under discussion.* 31.67% of teachers with didactic grade I (65.52% of total) always encourage students to ask questions relevant to the subject under discussion.

40.00% teachers with didactic grade I (representing 82.76% of all teachers with didactic grade I) **always** provides appropriate feedback to students' verbal responses, and the written replies of students 30% of them, representing 62 07%.

All debutant teachers surveyed estimated that **always** come prepared for lessons and creates a positive feeling, changing the atmosphere in the classroom, compared with 40% teachers with didactic grade I (48% of total), representing 82.76%, ***always*** *come prepared for lessons and creates a positive feeling, changing the atmosphere in the classroom*, 18.33% teachers with second degree (representing 84.57% of all teachers II grade) and 18.33% of teachers with definitive grade (representing 78 56% of teachers with definitive grade).

MEDIATION MEANING

Statistical analysis carried out leads us to affirm that, indeed, teachers with didactic grade I *succeeded* to a greater extent compared to the other three categories *to transform the material by changing the frequency or intensity of submission, provide positive feedback or negative the students, asking the students "how" and "why" questions related to the process.*

TRANSCENDENT

On the question *Explain principle or concept going beyond the immediate situation*, nearly half of respondents, teachers with didactic grade I states that do this often and always, the cumulative percentage of teachers who possessed the teaching with didactic grade I, definitive and the debutante it is identical with similar responses.

Teachers, most of them, regardless of didactic grade, states that link the subject of a future lesson or previous lessons. However, this time, the percentage of teachers with didactic grade I **always** *stating that binds the subject of a future lesson or previous lessons* is much higher (40%) than other categories of teachers surveyed.

When asked whether *that explains how the process is based on solving a problem that can be used in various situations*, teachers are more reserved in responses, only 26.67% of those who hold didactic grade I says do this always and only 6.67% of teachers holding didactic grade II, 5.00% of the definitive grade teachers and only 1.67% of the debutant teachers.

The situation is relatively similar for *encouraging the students to use skills which are useful in many situations.*

COMPETENCE

Most teachers included in the survey *says that selects and always show students the material in an accessible form their level of development*. The situation is similar for *the formulating questions considering the level of development of students.*

As opposed to general situation so far resulted from analysis of specific indicators first 4 parameters mediated learning analyzed for indicator *Decompose a complex task into smaller parts to reduce anxiety*, debutant teachers are performing this fragmentation workload a high proportion compared to other categories. Teachers differentiate when it comes *to reward successful steps towards solving a problem child and participate in an activity.* It notes that the degree of expertise of teachers is higher, the more frequently they call reward

SELF-REGULATION AND CONTROL BEHAVIOR

Interesting is the similarity of the responses to all the teachers interviewed on specific topical issues concerning self-regulation and control behavior. Thus, three of the four indicators of this parameter nearly 60% of teachers report that they **always** *form the students an active learning - a good classroom management, encourages self-discipline, shaping them respect, commitment and perseverance in class activities*. Regarding the *control of student's impulse*, teachers are clearly distinguishable. They are advantageous teachers who hold didactic grade I.

PARTICIPATION

For parameter called PARTICIPATION, all investigated teachers say that **always** *apply effective methods of teaching group encourages students to help each other - encouraging tutoring, encourages students to listen to each other's and be empathetic to the feelings of others.*

However, there are clear indications that lead us to affirm that the degree of expertise of teachers is low, so their ability to use elements of metacognitive development is limited. We make this assertion based on the interpretation of certain specific indicators of this parameter, and we refer to that as the teachers have a greater expertise, *the greater the frequency with which encourages students to share their work experiences with others*. Worrying is that debutant teachers do not always share the students how to solve a task correctly.

INDIVIDUALIZATION

Analysis of specific indicators parameter mediated learning called INDIVIDUATION leads us to say that ***the opinion of the teachers is similar***, ***regardless of didactic grade they hold***, so they *encourage original thinking and independent and gives students a chance to do innovative work; allow students to choose some activities in the classroom and encourage diversity in the use of leisure time. Accent the positive aspects of multiculturalism and respect the right of every student to be different and do not require students to complete assimilation own beliefs and values.*

PLANNING PURPOSES

Analysis of the responses provided by teachers of specific indicators parameter planning purposes, place us in a similar situation exposed to analysis parameter *participation* when debutant teachers always used to say they do not share their students how to solve a task. As mentioned, a situation similar to that contained in the indicator *Explain to students the strategy*

underlying reaching a goal, debutant teachers do not always develop students' need and ability to formulate goals and needs far as circumstances change, unlike other categories of teachers..

We ascertain however, that all categories of teachers in similar proportions, *cultivates the desire and the capacity of students to set realistic goals, encourages perseverance and patience to an end, shape their behavior goal oriented setting clear objectives for each lesson and for learning in general; encourages autonomy of students about their future prospects.*

INTERESTING CHALLENGES

Statistical analysis of this parameter apart again clear how teachers are positioned towards the issue up for discussion, so that the higher the level of expertise of teachers is higher, so they resort to various ways by pursuing the challenge and increase student interest. Teachers involved in the study stated that always encourage intellectual curiosity of students, originality and creativity, provide students new and complex situations. And the same time, again appear clear distinction between onset and other categories of teachers. Debutant teachers in education sometimes encourage students to think about their own examples and present them to the class.

AUTO CHANGING

Most teachers surveyed promote individual self-assessment and progress; discourages students in the use of external criteria to assess their progress, labeling discourages students; changes in consciousness generates its own self in relation to others and the environment; mediates self-change route development by sharing their experiences and learning. However, this time, teachers with didactic grade I states that achieved with greater frequency these actions compared to other teachers.

Conclusions of the first hypothesis

As a result of analysis performed, we can say that **the hypothesis is confirmed**: ***if the level of expertise of teachers is greater, then they have recourse more frequently in classroom activities, to the principles / parameters mediated learning.***

Verification of the hypothesis no. 2

Mediated learning principles are manifested more in special education than in mainstream education and special integrated education.

Following statistical analysis type Crosstabulation, we find that 50% (48 of the 96) teachers in special education determines a greater increase interest and motivation of students, they state that always done, while only 96 out of 136 teachers in mainstream education determines the increase students' interest and motivation.

When asked whether encourages the student to ask questions relevant to the subject in question, 68 out of 96 teachers who professes special education, represent 70.83% and 88 who teach in the school of the table, represent 64.70%, says They always used to encourage the student to ask questions relevant to the subject under discussion. Again special education teachers are the lead. 70.83% of special education teachers say that always come prepared for lessons and creates a positive feeling, changing the atmosphere in the classroom. And this time the percent of teachers

in mainstream education who say they always come prepared for lessons and creates a positive feeling, changing the atmosphere in the classroom is 91.17%.

The above statistical analyzes have shown us that special education teachers using a greater extent mediated learning principles than mainstream education teachers and the integrated special education. Therefore, the ***specific hypothesis is confirmed.***

Study no. 4 – Metacognitive Awareness Strategies Involved in Mathematical Activities for Students with Visual Impairments

The hypotheses of the study four

1. *Students with blindness using greater awareness metacognitive strategies in mathematical activities compared with their peers with low vision.*
2. In the perception of teachers from special education, students with blindness have a higher level of development of specific behavioral indicators of metacognitive awareness related to math than students with low vision.
3. Teachers from special education believe that students with visual impairments have a level of metacognition development above average.
4. There is a strong and positive correlation between the level of metacognition assessed by the teacher, and the type of visually impaired and intellectual development.
5. There are statistically significant differences between how students self-evaluate their metacognitive skills and teacher assessment.

Objectives of the study no. 4

O1: *Identifying the extent to which blind students used metacognitive awareness strategies in mathematical activities compared with their peers with low-vision.*
O2: *Determining the level of development for behavioral indicators that are specific metacognitive awareness to mathematics for students with blindness in relation to the students with low-vision.*
O3: *Highlighting the development level of metacognition for students with visual impairments in the perception of teachers in special education*.
O4: *Determining the presumed relationship between the teachers assessed metacognition level, type and level of visually impaired and intellectual development*.
O5: *Quantification of possible differences between how students self-evaluate their metacognitive skills and teacher assessment*.

Research methods:
1***. Inventory of metacognitive awareness*** (Jr. MAI) ***Junior Metacognitive Awareness Inventory*** - version A and version B, authors: Dennison, Murphy, Howard, & Hill (1996). (see Annex no. 4).

Inventory MAI - jr., Version A, applies to students in grades III, IV and V.
Inventory MIA - jr., Version B applies to students in grades VI, VII, VIII and X.

2. ***Inventory of metacognitive awareness***. ***Metacognition students assessed by teachers*** (see Annex no. 5)
3. ***RAC PAC - Metacognitive self-regulation questionnaire for teachers*** (see Annex no. 6).

The sample of this study consists of:

- 70 visually impaired students, grades III - X from Special High School "IRIS" from Timisoara (school for students with visual impairments).
- 5 teachers in special education for students with visual impairments, 2 psychologists teachers who teach in class III and IV and 3 teachers who teach mathematics in classes at the middle school and high school.

Verification of the hypothesis no. 1:

Students with blindness using greater awareness metacognitive strategies in mathematical activities compared with their peers with low vision.

To verify this hypothesis we use statistical analysis of cross-type - Crosstabulation, the development level of the four strategies of awareness metacognitive activities math (Prediction, Planning, Evaluation and Monitoring) self-assessed by students and type of visual impairment on other side.

64.20% students with blindness using a high level of metacognitive awareness strategy PREDICTION in mathematics and 53.65% of students with low vision have a high level of use of PREDICTION strategies in mathematics

57.14% of students with blindness have a high level of metacognitive awareness strategy PLANNING at mathematics, and only 39.02% of students with low vision are at the same level.

From the analysis of the strategy called MONITORING, results that students with blindness in the proportion of 44.44% have a high level of development of this strategy, compared to 39.02% of children with low vision.

Cross Analysis: *The development strategy metacognitive awareness Assessment in mathematics, self-rated students * Type of visual impairment* results that 71.42% of children with blindness have a high level of development of metacognitive awareness strategy called ASSESSMENT, compared to students with low-vision (43.90%).

Indeed, a student with blindness presents a higher level of development of the specific behavioral indicators strategies of metacognitive awareness to mathematics. Therefore, the hypothesis is confirmed: students with blindness using greater awareness metacognitive strategies in mathematical activities compared with their peers with low-vision.

Verification of the hypothesis no. 2

In the perception of teachers from special education, students with blindness have a higher level of development of specific behavioral indicators of metacognitive awareness related to math than students with low vision.

To verify this hypothesis we use statistical analysis of cross-type - Crosstabulation the development level of the four strategies of awareness metacognitive (Prediction, Planning, Monitoring and Evaluation) in mathematics assessed by teachers and type of visual impairment, on the other hand.

75.57% students with blindness have a high level of development of PREDICTIVE strategies in mathematics, teacher assessed level.

56.09% of students with low vision have a high level of development of PREDICTIVE strategies in mathematics.

Regarding the development of the strategy PLANNING, 64.28% of students with blindness presents a high level of development and only 48.78% of students with low vision are at the same level.

From the analysis MONITORING level of development of the strategy in mathematics, assessed level of teacher results that students with blindness in the proportion of 64.28% have a high level of development of this strategy, compared to 36.58% of children with a low-vision.

The analysis of *the development strategy* EVALUATION *at mathematics, teacher assessed * the type of visually impaired* results that 78.57% of students with blindness have a high level of development of the strategy EVALUATION versus students with low-vision (63.65%).

The statistical analyzes performed support the idea that a student with blindness presents a higher level of development of strategies metacognitive awareness to mathematics, assessed by the teacher level. Therefore, the hypothesis is confirmed: ***in the perception of teachers, students with blindness using greater awareness metacognitive strategies in mathematical activities compared with their low-vision peers.***

Verification of the hypothesis no. 3

Teachers from special education believe that students with visual impairments have a level of metacognition development above average.

Following statistical analyzes conducted, we can say that 19 students with visual impairments (34.54%) has metacognition above average, 13 students (23.63%) have a high metacognition, and, in contrast, 7 pupils has a metacognition very low (12.72%).

Therefore, the specific hypothesis is confirmed, ***special education teachers believe that students with visual impairments have a level of metacognition development above average***.

Verification of the hypothesis no. 4

There is a strong and positive correlation between the level of metacognition assessed by the teacher, and the type of visually impaired and intellectual development.

We wanted to identify the possible relationship existing between the metacognition evaluated by the teacher, the type of visually impairment and level of intellectual development, and based on statistical analysis of the data we can say that the only one correlation is valid, is established between the metacognition students rated teacher and Level intellectual development. At a threshold of significance, p = .005, have a correlation coefficient, r = .377, positive correlation of weak to moderate strength.

Therefore the hypothesis disprove: ***there is not exist a strong positive correlation between the level of metacognition evaluated by the teacher, and the type of visually impaired intellectual development.***

Verification of the hypothesis no. 5

There are significant differences statistically between how students self-evaluate their metacognitive skills and teacher assessment.

Comparative analysis of the level of development of specific behavioral indicators awareness strategy metacognitive **prediction**, math, students and self-rated level of development of specific behavioral indicators awareness strategy metacognitive prediction, math, teacher assessed: t test amounts to 1,352 at 54 degrees of freedom (df) and a significance level of p = 0.182. By consulting tables contain critical values of the distribution t test, we find that the value that we calculated it is higher than the value of standardized tables (1303). Therefore, there are significant differences between how students and teachers self-evaluates **Prediction** strategy.

The next pair is compared: The development of the **Planning** Strategy at mathematics, a self-students - Level Development Planning strategy in mathematics, rated by teacher: has a value of 0.227 t-test; 54 degrees of freedom (df) and a significance level of p = 0, 821. By consulting tables contain critical values of the distribution t test, we find that the value that we got it is less than the amount of the table. Therefore, there are no statistically significant differences between how students and teachers self-evaluates the planning strategy.

The pair no. 3: The development of the **Monitoring** strategy, mathematics discipline, self-assessed by students - Level monitoring development strategy in mathematics, rated by teacher: test t is 0, 275; 54 degrees of freedom (df) and a significance level of p = 0, 784. By consulting tables contain critical values of the distribution t test, we find that the value that we got it is less than the amount of the table. Therefore, there are no statistically significant differences between how students and teachers self-evaluates the monitoring strategy.

The pair no. 4: The development of the **Evaluation** strategy, the mathematical discipline, self-assessed by students - Evaluation level of development of strategy, discipline math teacher assessed: test t is from -1.150 to 54 degrees of freedom (df) and a significance level of p = 0, 255 By consulting tables contain critical values of the distribution t test, we find that the value that we got it is less than the amount of the table. Therefore, there are no statistically significant differences between how students and teachers self-evaluates the Evaluation strategy.
Following statistical analysis undertaken, we can say that there are no statistical significant differences between how students self-evaluate their metacognitive skills and teacher assessment. Specific hypothesis is disproven.

Study no. 5 - metacognitive awareness of reading strategies for students with visual impairments

The hypothesis of the study:

1. *Students with blindness using with a higher frequently strategies for solving the tasks of reading compared to students with low vision.*
2. Students with blindness using with a higher frequency strategies to support reading compared to students with low vision.
3. Students with blindness using with a higher frequency overall strategy for reading compared with students with low vision.
4. If the intellectual level of students with visual impairments is higher when they use greater metacognitive reading strategies.

Objectives of the study:

O1: *Quantifying the frequency with which blind students use problem-solving strategies in reading tasks, compared to students with low vision*
O2: Determining the frequency with which blind students use support strategies of reading, compared to students with low vision.
O3: Determining the frequency with which blind students use reading overall strategy compared to students with low vision.
O4: Identifying the extent to which students with visual impairments use metacognitive reading strategies based on their own intellectual level.

Method:

Inventory of metacognitive awareness of reading strategies **(MARSI)** Version 1.0 Author: Kouider Mokhtari și Carla Reichard, 2002.

MARSI Inventory **contains a total of 30 items**, grouped in according with metacognitive reading achievement:
1. *Global Reading Strategies*
2. Strategies for problem solving

3. Strategies for reading support

The sample:
70 students with visual impairments, grades III – X, Special High School "IRIS" in Timisoara.

Verification of the hypothesis No.1
Students with blindness using more frequently strategies for solving the tasks of reading compared with students with low vision.
35.71% of students with blindness using more frequency strategies for problem solving in reading, compared to **58.53% of students with low vision**.
Therefore, **hypothesis is disproven, students with blindness does not use a high frequency strategies for solving the tasks of reading compared to students with low vision**.

Verification of the hypothesis no.2
Students with blindness using with a higher frequency strategies to support reading compared with students with low vision.
Data analysis shows that 14.28% of students with blindness using a more frequency strategies to support reading, compared to 29.26% of students with low vision.
In conclusion, **hypothesis is disproven**, **students with blindness does not use *with a higher* frequency strategies to support reading compared to students with low vision**.

Verification of the hypothesis no.3
Students with blindness using with a higher frequency overall strategy for reading compared with students with low vision.
28.57% of students with blindness using with a higher frequency global strategy for reading compared to 29.26% of students with low vision.
Hypothesis is disproven: **a student with blindness does not use a *higher* frequency global strategy for reading compared to students with low vision.**

Verification of the hypothesis no.4
If the intellectual level of students with visual impairments is higher when they use greater metacognitive reading strategies.
Data analysis leads us to say that overall reading strategies are used at a high frequency by children below the average intelligence and average.
12 children with below average intelligence (representing 66.66%) use high frequency strategies for solving the tasks of reading, as opposed to 3 of the 6 children (50%) with superior intelligence who use the same strategy.
As for the frequency with which strategies are used to support reading, again below average intelligence students use most frequently (7 out of 18 children).

Hypothesis is disproven: **high intellectual level of students with visual impairments does not involve greater metacognitive reading strategies**. On the contrary, in conditions of intelligence below the average, more frequently used metacognitive reading strategies.

CONCLUSION

Conclusions of the meta-analysis study

- ✓ The experimental results of the meta-analysis study did not demonstrate a significant difference in terms of intelligence functioning in people with visual impairment compared to individuals without visual impairment under suitable conditions for conducting teaching-learning activities, respecting the specificities determined by age, the visually impaired, intellectual level, adapting teaching methods to the specific deficiency, systematization and grading tasks. However, it should be noted that it is very important nature of the items included in intelligence tests. In the present study to verify the first hypothesis, intelligence quantified based on oral evidence, confirming once again finding existing research in the field, research which concludes by stating that there is no difference between verbal intelligence of the blind against the people without visually impaired. On closer examination of the problem studied, may appear empty words, meaningless forms and verbalism resulting feedback used by the blind exaggerated to the detriment of activism. This problem requires urgent fixes in education and therapeutic solution would be to implement education programs metacognitive (Borca, C., 2008).

Conclusions of the pilot study *Cognitive and structural modification in the conditions of a visual impairment*

- ✓ The ability of students to use the knowledge in different contexts / strategies resolution is determined by a stage of learning, from which they learn the proper ways to work with information efficiently using declarative and procedural aid. On this point teachers should insist on curricular activities, developing their students' ability to learn and think autonomously developing cognitive processes in a mediated learning Borca, C., 2007). Knowing that every child has the potential for change and engage in development activities is the premise of practicing metacognition. Of particular importance here are active and participatory methods in which the student discovers knowledge, going through a learning process, becoming able then to apply them in new contexts.

- ✓ It has been demonstrated experimentally in this work that students have the ability to learn and apply effective material along engrams need a small amount of aid offered by adult. It abolishes the idea that it should be given unlimited support children. Parents and teachers are

often faced with situations where the child's place of work involuntarily desire to assist. Helping children means developing strategies to mediate heuristic, discovery through active participation in activities. In the curricular activity is recommended waiver of educational relationship unidirectional own traditional education

- ✓ Students with a fast rhythm of learning, have a great capacity for learning, accompanied by the ability to use the new knowledge acquired in various contexts. The reverse situation applies here, the slow pace of learning is an indicator of a reduced transfer capabilities and an inefficient learning. The reverse situation applies here, the slow pace of learning is an indicator of a reduced transfer capabilities and an inefficient learning. It is here about children with learning slowly, often found in schools for the visually impaired, forming groups and heterogeneous classes with different learning rhythms. In these cases it is recommended differentiation and instructional and educational activity.

Conclusions from the study no. 3 Metacognition and mediated learning

- ✓ *If the level of expertise of teachers is greater, then they have recourse more frequently in classroom activities, to the principles / parameters mediated learning.*
  Teachers with didactic grade I hold more frequent use in classroom activities the principles / parameters mediated learning.
- ✓ *Mediated learning principles are manifested more in special education than in mainstream education and special integrated education*

Conclusions from the study no. 4 - *Metacognitive Awareness Strategies Involved in Mathematical Activities for Students with Visual Impairments*

- ✓ Students with blindness present a higher level of development of the specific behavioral indicators strategies of metacognitive awareness to mathematics. Students with blindness using greater awareness metacognitive strategies in mathematical activities compared with their peers with low-vision.

- ✓ The statistical analyzes performed support the idea that a student with blindness presents a higher level of development of strategies metacognitive awareness to mathematics, assessed by the teacher level. Therefore, the hypothesis is confirmed: ***in the perception of teachers, students with blindness using greater awareness metacognitive strategies in mathematical activities compared with their low-vision peers.***
- ✓ ***Special education teachers believe that students with visual impairments have a level of metacognition development above average***.
- ✓ ***There does not exist a strong positive correlation between the level of metacognition evaluated by the teacher, and the type of visually impaired intellectual development.***

- ✓ There are no statistically significant differences between how students and teachers self-evaluates the **predictive** strategy
- ✓ There are no statistically significant differences between how students and teachers self-evaluates the **planning** strategy.
- ✓ There are no statistically significant differences between how students and teachers self-evaluates the **monitoring** strategy.
- ✓ There are no statistically significant differences between how students and teachers self-evaluates the **evaluation** strategy.
- ✓ Following statistical analysis undertaken, we can say that there are no statistical significant differences between how students self-evaluate their metacognitive skills and teacher assessment.

Conclusions from the study no. 5 - Metacognitive awareness of reading strategies for students with visual impairments

- ✓ Students with blindness does not use a high frequency strategies for solving the tasks of reading and reading strategies to support comprehensive strategies for reading compared to students with low vision.
- ✓ High intellectual level of students with visual impairments does not involve greater metacognitive reading strategies. It was found through the survey conducted under intelligence below the average level, it calls more frequently in metacognitive reading strategies.

Research limitations

1. The main limitation of the research is that it failed to meet criterion representativeness data from the entire school population of Romania.
2. From here another limitation that does not have the ability to generalize the findings and conclusions to the entire population of Romanian school.
3. The small size of the sample of children with blindness.
4. Study no. 4 attended a few mathematics teachers teaching in special education for students with visual impairments.

Future research directions

1. We propose to investigate the metacognitive phenomena in other categories of educators, and we refer to children with special intellectual abilities.
2. Conduct a survey on education metacognitive, representative for Romania.
3. Achieving a methodological tool to include methods and strategies to stimulate metacognitive skills and "equip" students with these metacognitive strategies useful in the work in the classroom and beyond.
4. Develop a longitudinal study, which aimed effectiveness and impact that these metacognitive strategies in the school population with and without disabilities.

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