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DOCTORAL SCHOOL “EDUCATION, DEVELOPMENT, COGNITION”**

DOCTORAL DISERTATION

INTERVENTION PROGRAMS FOR CHILDREN WITH LEARNING DISABILITIES

SUMMARY

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Key words: learning disabilities, instrumentals functions, Sindelar program of instrumental functions development, inter human relations, self-knowledge, inter-knowledge.

Lately, the children classification and labeling in different categories, according the deficiency, was replaced by the concept of “children with special educational needs”. There is a higher need for normal schools to get involved by developing their objectives, so that they may comprise a greater diversity of children and allow including, in the general system, as many children with special educational needs as possible.

In full agreement with international legislation concerning the equalization of opportunities and the education for all, the strategy proposed by the Ministry of Education wants to be a coherent, logical and modern one, aiming to: ensure total and active participation in community life, of students with deficiency, permanent assistance of these students to lead them to an independent life in accordance with their own needs and aspirations, but also with their capacities of achievement; the treatment of deficiencies causes, the prevention of their aggravation, the diminution of the consequences incurred by students; the avoidance of any form of discrimination. This attitude manifested at the level of entire society must respect the principle of normalization , that is, ensuring the access, for all categories of people, to existential patterns and conditions of daily life, the closest, if possible, to the rules considered normal for an ordinary life.

Strategies of forming a positive attitude regarding the efficient integration and inclusion of all categories of children should take into account the specific situation of each child integrated into regular school and also the complex context in which integration takes place. However there is a category of children that still seems to be disadvantaged, unknown, namely children with learning disabilities.

Definition of the concept of **learning disabilities** it's a rather difficult approach due to the special nature of the phenomenon. As the studies and research on the difficulties of learning progressed, various authors that have been concerned with this problem developed a number of definitions that have successively appeared within a few years, either by adding new elements, or giving up some of the previous, considered obsolete. In time, there have been established several meanings of the term, from school difficulties seen as obstacles, problems encountered by

students in school learning, to learning difficulties understood as disabilities or as well as specific learning difficulties.

There is an interesting correlation between learning disabilities and instrumental disorders defined by Haim (1963, by Vrasmas, E., 2007, p. 25) as "a neurobiological data set involved in human adaptation to material environment, through the dynamics, and to human environment through language." Actually, this refers to the totality of functional mechanisms that may be considered learning instruments or which facilitate the learning process.

More studies support the idea according to which school maladjustment and problems encountered by students in learning process are due, in a quite large proportion (two of three cases), to instrumental and affective disorders.

The present paper starts just from this premise, trying to demonstrate (the fact) that in situation in which the instrumental functions affected are corrected and develop normally, these will lead to the improvement of school performance of students with learning disabilities.

Children who experience learning disabilities, may have progresses, even if reduced, if they are helped, and if they are accepted by the teacher and the class they belong to, they will strive harder to meet curriculum requirements and to overcome these difficulties.

Regarding the structure of the paper, as it can be noticed in the contents, there are two theoretical chapters and two covering the practical part.

Chapter I, entitled " Learning disabilities- interdisciplinary approach" deals with the issues of learning disabilities.

The starting point was the development, understood as the complex process of transition from inferior to superior, from simple to complex, which is achieved by a series of stages, a process in which, in certain situations, may occur problems that will lead to the emergence of development disorders, delays in development and learning disabilities. We tried defining learning disabilities both from unilateral and interdisciplinary perspective, concluding that a child / student deals with learning disabilities if:

- there is a significant difference between his capacities and the school performance he achieved;
- his own progress in learning is minimal or zero, for a longer period of time
- he has a disability / incapacity which prevents him to use the educational facilities available for children of his age;

- works at a lower level than children of the same age;
- has persistent difficulties in literacy learning and mathematical calculation;
- he has emotional and behavioral problems that are preventing -frequently and at a considerable level - the learning process of the child or of the whole class;
- has sensory and mental disabilities that require specialized equipment or additional specialized services;
- has ongoing communication and interaction difficulties that impede him in developing balanced social relationships and create obstacles in the learning process.

Definition of work issued and used by us was: *learning disabilities are represented by disorders in the field of learning that prevent the student obtain the same school performance with other peers (of the same age, same intellectual level) without having any visible and recognizable deficiency or disability. These can be caused by lack of development or incomplete development of some instrumental functions but also by a low self-esteem due to some relating problems with other people.*

Further on it is presented the etiology, different taxonomies from the literature but also personal taxonomies, the componential structure of learning disabilities (assuming we can talk about cognitive component, affective, motivational, volitional, of character and temperament), the methods of detection, examination, evaluation and educational intervention.

The second chapter of the paper presents a program of instrumental functions evaluation and development that could be the basis for learning disabilities, proposed by the Austrian psychologist Brigitte Sindelar. The probe that evaluates the instrumental functions: visual and acoustic attention, visual and acoustic perception, visual and acoustic memory, intermodal coding, serial perception, verbal motricity, visual-motor coordination, spatial-temporal orientation, comprises a number of 19 verbal and non-verbal sub probes which are individually administrated and whose utilization is relatively easy because it does not require special tools and are not related to time. The only requirement is to create a favorable environment in which the child feels better. The development program of affected instrumental functions is also presented, a program that was taken over and adapted as required by the Romanian educational system and students' abilities we have worked with.

The third chapter entitled **The experiment conducted on the theme "Intervention programs for children with learning disabilities"**, contains the description of ascertaining phase which was the basis for the formulation of objectives and research hypotheses and it also comprises the results obtained by us at this stage.

The objectives formulated for the ascertaining stage were the following:

- the knowledge and description of atypical processes identified in the development and functioning of young children, of the causes that lead to their emergence, the factors that determine these processes, the domains in which these may occur
- the analyze of the relation between school results of students with learning disabilities and the functioning of instrumental functions
- the evaluation of the main instrumental functions which may determine the emergence of learning disabilities
- the radiography of relations that exist in the class group integrating children with learning disabilities
- creation / projection and implementation of some intervention programs for children with learning disabilities in order to improve their school performances

The sample of subjects with which it has been worked was established on the basis of stratified randomization taking into account the chronological age of the subjects (students of 9-10 years old, III-rd grade). I worked with a number of 60 subjects of which 30 belonged to the experimental group and 30 to the control group.

The methods used in the ascertaining stage were the following: the psychosocial observation, the Progressive Color Matrix test, the Sindelar method, the sociometric test and sociometric matrix. On the basis of pretest results interpretation the main conclusion that may be drawn is the fact that the two groups, the experimental group and the control one, are almost identical with regards to the development of instrumental functions, to the results obtained in Romanian Language and Mathematics but also to the way in which the students with learning disabilities are regarded and perceived by their peers (all results being supported by significance thresholds higher than 0.010 at test t).

Based on interpretation of the results of the pretest main conclusion that can be drawn is that the two groups, experimental and control, are in the development of instrumental functions, and the they are regarded and students with learning difficulties perceived by their peers

The experimental research conducted for the creation and implementation of some intervention programs with “good practices” value for students with learning disabilities was subordinated to methodological principles and norms that are guiding the completion of pedagogical investigations. Thus the experimental approach of the present theme involved three distinct stages:

- the stage of theoretical documenting and synthesis of data provided by the investigative approach of ascertaining nature, which led to the formulation of experimental hypothesis;
- the stage of operational space delimitation, a stage that was embodied in the selection of content and investigated population;
- the stage of completing the experimental design, respectively the projection of the pretest, of the experiment itself, the posttest, retest and their content;

The investigations subsumed to the present research are set in accordance with the following specific objectives:

- the projection and implementation of some intervention programs for children with learning disabilities in two main directions:
 - the cognitive stimulation of instrumental functions that could be the cause of learning disabilities
 - the improvement of the relations within the group that integrates children with learning disabilities
 - the recording, monitoring and comparing of the results obtained by students from the experimental and control group in pretest, posttest and retest

Organizing and conducting the experiment was based on the synthesis of theoretical premises and specific objectives set out above, allowing the formulation of the working hypothesis necessary for an efficient and relevant experiment. Therefore, the basic assumption under which the experiment was structured is based on the idea that the intervention programs created in order to develop instrumental functions that cause learning disabilities but also in order to improve the relations of students with atypical processes in development with other classmates, would create a favorable learning context, this leading to the increase in the school results of third grade students in Romanian language and mathematics.

In a summary manner, the general hypothesis necessary to organizing and conducting the experiment could be the following: **The creation and implementation of some intervention programs with "good practices" value may contribute to the improvement of school performances in children with atypical processes in development**

Because the research was directed on two main directions I considered necessary for the general hypothesis to be concretized in two secondary ones. Thus we have:

Secondary hypothesis 1:

Introducing a program of cognitive stimulation of instrumental functions in children with atypical development processes (learning disabilities) determines the improvement of these children's school performances.

Null hypothesis (Ho): improving school performances of students with learning disabilities is due to hazard.

The independent variable: A- the type of intervention (cognitive stimulation of instrumental functions)

a_0 – the control group, without intervention

a_1 - the experimental group, subjected to cognitive stimulation program

The dependent variable: X- school performances quantified in grades obtained in Romanian Language and Mathematics

Secondary hypothesis 2:

The introduction of some activities of knowledge and self-knowledge of students, counseling activities for the integrator group (of children with learning disabilities) may contribute to the improvement of the relations within the group (of the group in general, between the students with learning disabilities and the other members of the group)

Null hypothesis (Ho): the improvement of the relations within the group are due to hazard

Independent variable: B- type of intervention (counseling program)

b_0 – the control group, without intervention

b_1 – the experimental group, subjected to counseling program

Dependent variable Y – the type of relations within the group

The experimental design

The experiment was carried out during the school year 2010-2011 according to the following experimental design:

Table no. 1. The general experimental design

Stage Lotul	Pretest	Experimental stage	Posttest	Folow-up
Experimental	The sampling Setting the level at which the lots of subjects are found The diagnosis The same testings are applied to both groups	The introduction of independent variables	Measuring the dependent variables Identical to both groups	Measuring the evolution in time of the characteristics that were analyzed The same testings are applied to the both groups

The pedagogical experiment has been carried out in the period 2010-2011, with the following stages and distinct sequences:

- the ascertaining stage completed with the pretest administration;
- the stage of psycho pedagogical intervention and the application of the test;
- the retest;

The ascertaining stage was conducted from May to November 2010 and at the end of it took place the pretest administration. The pretest stage was organized and designed so as to permit the establishment of the degree of statistical comparability between experimental groups and the control ones in terms of development of instrumental functions, of students' school performances in Romanian and Mathematics but also of the way in which the relations are established in a classroom.

The stage of formative experiment development was carried out between November 2010 and May 2011 and took into account the intervention upon the educational and didactic activity in the experimental group, while the activity of the control group was conducted without being influenced by any of the expected experimental variables. At the end of this period the post test was given, the main aim of it being the comparative monitoring of school evolution of students from the experimental group and from the control one, in order to confirm the experimental hypothesis but also the relations established within the integrator group, the class of students.

The retest stage that took place in September and October of the school year 2011-2012, aimed at verifying the stability in time of the results obtained during the experimental intervention performed the previous school year.

To ensure the framework imposed by the need to test the validity of the formulated hypothesis, to conduct the experiment, we designed a formative intervention program held during the school year 2010-2011, applied to classes involved in the experiment within the framework of curricula.

The experimental program consisted of:

1. the creation and implementation of some development programs of the instrumental functions whose poor functioning may underlie the learning disabilities
2. the creation and development of some counseling activities based on knowledge games, self-awareness and communication in order to improve the

relationships within the group integrating the students with learning disabilities included in the experiment.

For the optimal development of the experiment it has been taken into account a collaboration with school teachers and especially with teachers from classes which formed the set of subjects, consisting in explaining the purpose and conditions of research achievement, requiring their support and collaboration for carrying out the program.

With regard to Chapter IV of the paper, it deals with the Analysis and the interpretation of results. This refers both to the results obtained after the introduction of the program of development of instrumental functions in children with learning disabilities and the performances obtained by these children in the two subjects, i.e. Romanian and Mathematics but also to the results concerning the way in which students with atypical processes in development are perceived by the class- integrator group.

The values of significance thresholds obtained are given in the table below.

Table no. 2. The values of F (Fischer) for students' performances in Romanian Language and Mathematics.

	df	F	p
Results Mathematics.	1-58	82,693	,000
Results Romanian Language	1-58	37,936	,000

The value of F (1,58) - results Mathematics= 82,693, significant at $p < 0,01$

The value calculated for F (1,58) – results Romanian Language = 37,936 is significant at a $p < 0,01$

From all this we can draw one conclusion, namely: the instrumental functions affected or nonfunctional can lead to learning disabilities but intervening upon them, stimulating their development, the children' school performances may be improved. Hence the intervention is effective. It means that the first experimental hypothesis: **the introduction a program of cognitive stimulation of instrumental functions of children with atypical processes in**

development (learning disabilities) determines the improvement of these children school performances can be confirmed.

After the hours of counseling that lasted two months (one hour per week), whose activity projects are given in Annexes, I applied again the same sociometric test composed of three items:

- Student's posture in his desk
- individual study
- playing during the break

The results were interpreted by means of sociometric matrices on the basis of which we calculated the sociometric indices which confirm the secondary hypothesis no. 2: **the introduction of some activities of knowledge and self-knowing of students, of counseling the integrating group (of children with learning disabilities) contributes to improving the relations within the group (of the group in general, of students with learning disabilities with other group members).**

In my view the improvement of the relations within the group will lead to the increase of that group's syntality, to a stronger desire of helping others, to a better acceptance which will have as a result the improvement of school performance of students in that class, in general, and of those with learning disabilities in particular.

The results obtained by the experimental group are due to the implementation of an intervention program based on the development of instrumental functions involved in the emergence of learning disabilities on one hand, and on the other hand based on the counseling of the class where students with learning difficulties are integrated. Thus we are able to appreciate that the two null hypothesis are suspended, the positive changings occurred in the case of students from the experimental group are not due to the aleatory, conjectural, situational, random factors, but to the intercessions which facilitated the achievement of some results significantly increased (statistically) in the case of experimental group, compared with the control group. Rejecting / cancelling the null hypothesis, we accept the truth value of the hypothesis formulated at the beginning of the research and we recommend the implementation of independent variable in other educational contexts too, by means of the application of programs based on instrumental functions development and on the counseling of classes where students with atypical processes in development are integrated.

In conclusion we may say that the posttest results obtained by the experimental groups show the effectiveness of the formative intervention on the amelioration of students' school results. The above statement is supported by significance thresholds lower than 0.05 in each case, as highlighted by statistical calculations which were done and which demonstrate the positive changes occurred in the experimental groups.

The results from the retest confirm the effectiveness of development program introduced, showing that they have kept their efficiency over time, the measurement being applied to a period of three months after the ending of formative experiment.

Conclusions related to the proposed objectives and hypothesis

In the literature (Bruner, 1970, Feuerstein 1979; Fodor and Spelke 1990, Nelson 1996, Geary 1998, Tomasello 2002, Sindelar 1992, 1994), we often encounter ideas according to which:

- Human beings are changeable, the society could change if people who compose it would be changed
- An important role in cognitive development is owned by the language that contributes to the reflection and transformation of experience in order to be able to cope with the demands of society
- On the basis of learning and behavioral disorders, in addition to other causes, are found in fairly large percentage (more than 20% of cases) weak instrumental functions or those with discordant functioning
- Instrumental functions that we have to take into account when we meet students with learning difficulties are: the different forms of auditory and visual perception and discrimination, forms of visual and auditory memory and attention, visual-motor coordination, body schema and spatial temporal orientation, articulatory motricity. If in these situations functioning problems occur, the chance to occur learning disabilities is much higher.
- To achieve positive results in learning it is necessary that the student have high self-esteem, or at least at average level, which depends largely on the way he's viewed and accepted by the group he belongs to, or he would like to be part of.

In the present research we started from the very ideas listed above, formulating on their basis a general hypothesis, namely: **The projection and application of some intervention programs with “good practices” value may contribute to the improvement of school performances at students with atypical processes in development..**

Surely, intervention for students with learning disabilities, as in the case of any other category of students may be oriented in very many directions: from the development of simple elements that can be the basis of difficulties until to the introduction of some intervention projects individualized for each student, from student’s counseling to the counseling of the group to which the student belongs or of the family having a student with a certain disability, from the training of teachers that work with this students to attempts to educate the society in which they are to be integrated. Normally, we could not include here all these elements, therefore our activity was guided towards two main directions, the main objectives being the following:

- cognitive stimulation of instrumental functions that could be the cause of learning disabilities
- the improvement of relations within the group integrating students with learning disabilities

Consequently, the first secondary hypothesis was: **The introduction of a program of cognitive stimulation of instrumental functions of children with atypical processes in development (learning disabilities) determines the improvement of these children’ school performances.** To this end, in testing the instrumental functions we used a very effective method and relatively easy to work with, developed by the Austrian psychologist Brigitte Sindelar. Based on the results obtained in the pretest we created a program of instrumental functions correction, program that contains both exercises taken over Sindelar and exercises that were adapted or created personally in order to achieve the proposed objectives. In the posttest and retest the instrumental functions were evaluated again using the same method and, analyzing the final results can be stated that in most cases the proposed program has been effective (evidenced by significance thresholds lower than 0.05), student’s results for each subtest (subtests that verifies the way in which instrumental functions develop), excepting 5 subtests, namely subtests 8 (intermodal integration- the connection between word and image), 9 (Serial-visual-memory- storing the images order) , 13 (intermodal-memory – rendering with words some specific images), 17 (Visual attention- identification of a form) and 18 (Acoustic attention - identifying a word in the text), fact that can be explained quite simply by means of school activities peculiarity and types of exercises that are conducted daily in school activities.

But what is seen as successful is the improvement of student' school performances in the two basic subjects (Romanian and Mathematics) in a relatively short time (6 months), with significant differences between pretest and posttest but also between pretest and retest, both in Romanian Language and Mathematics, the significance threshold being lower than 0,01.

The conclusion to be drawn analyzing the final results is that the secondary hypothesis no.1 is confirmed, the students with learning disabilities improve their school performances if their deficitaries instrumental functions are developed.

Regarding the second part of the intervention program, the one concerning the improvement of the image of students with learning disabilities within the integrating class group, which could lead to the improvement of these students' school performances, we managed to demonstrate that by using some games of knowledge-interknowledge, the image of students with learning disabilities in front of their peers increases (the sociometric indices computed in pretest, posttest and retest demonstrate this).

The experiment was conducted in four classes (2 - experimental, 2 – of control) but on a relatively small number of students with learning disabilities (6 students), even if the number of subjects included in the experiment was higher: 92 subjects from which 46 of the experimental group and 46 from the control group. The results confirm the secondary hypothesis no.2: **The introduction of some activities of students' knowledge and self-knowledge, counseling of the integrator group (of children with learning difficulties) can contribute to improving relations within the group (of the group in general, of students with learning difficulties with the other group members).**

Conclusions regarding the group of students that participated in the experiment

The efficiency of formative activities through the application of some intervention programs in order to develop the instrumental functions and to improve school performances of students with learning disabilities, but also to strength the cohesion of the class group where these students are integrated, carried out during a school semester, was recorded by means of applying the post-test, as well for the experimental group as for the control group. The purpose of applying this test was to register and compare school performances evolution at experimental group, by means of comparing the ascertaining stage and the experimental one.

The evaluation tests confirmed a significant growth for the experimental group while the control group maintained the initial performance level, a discrepancy between the two groups being observed, relevant from a statistical point of view. This proves that the implemented independent variable confirms the initial expectations and that it can be considered an optimal solution in ameliorating school results for the 3rd grade students.

The control group maintained at a constant, uniform level with small fluctuations at individual level in acquiring Romanian Language and Mathematics knowledge. Although through the curriculum there is allocated a much bigger number of hours at this subject in comparison to other, the learning results are more often lower than expected, and the frequency of learning difficulties are manifested both in oral and written communication capacity, mostly based though on the reading capacity, on a written text comprehension, on the logical, coherent and fluent reproduction of a specific test.

Regarding the experimental group, we can say that:

- during the game-like recovery activities, the students prove a higher motivation correlated with a high degree of lesson participation.
- The students are encouraged to involve in solving the work tasks combined with game elements, rewards, penalties and bonuses in a great variety, thus covering the whole learning sequence, becoming more motivated to gain new information
- being grouped in many of the activities, the students become aware of the fact that they are not the only ones to deal with such a problem, their capacity and will to help the other is developed, and this will lead to a higher tolerance within the class, to a reduced aggressiveness towards the other colleagues.
- the remedial activities performed with only one student, with differentiated tasks, lead to a privileged condition envy by the rest of the group, resulting an increase of the subject's self-esteem, the activity not being perceived as in the traditional system where the student is stigmatized and labeled by the group if performing an activity of this type
- counseling activities, through self-knowledge and inter-knowledge games introduced, lead to the increase of information that students have about each other, this contributing to a better acceptance, to an increase of self-esteem, even

to the improvement of school performances, of the desire to participate together in various activities that are organized

- the perception of working time and of the effort made decreases considerably, the students requiring permanently other lessons- counseling activities like
- new educational relations are being established between teacher and student, relations based on reciprocal trust, a communication released by the constraint of classical didactic discourse, the teacher is not any more the depository of information, he assumes new roles within the class

Certainly, we do not claim to have exhausted the theme tackled, in consequence from the limits of the work we can mention the following:

- the small number of students with whom the experiment was conducted, especially regarding the second hypothesis. But as it was already stated it is about the small number of students with learning disabilities who are included in a regular classroom. Or working in this situation with classes, the activity in several groups would have been, practically speaking, impossible. But, demonstrating the program efficiency, among the subsequent research intentions is also that of extension of these types of activities to as many as possible classes where are students with learning difficulties, first through co-opting and raising the interest of teachers who work with them.
- It was not yet realized a concrete and precise demonstration of the fact that positive relations within the class will increase school performance of students with learning disabilities. For the future we intend to achieve some correlation between students' school results, their self-esteem and the sociometric indices that show how they managed to integrate in the group / class they belong to.

The contribution of the present work would be:

- the attempt to synthesize as much as possible information concerning learning disabilities, in consultation with local and foreign bibliography.
- the emphasize of the role of basic functions (instrumental ones) in the cognitive development of preschool and school children

- the introduction of a method, less known and used in our country, that of instrumental function evaluation (Sindelar Method), which besides is relatively easy to apply and interpret and could be a real support to all specialists working with children that have different delays in development.

- Creating a program of instrumental functions development, based on the one developed by Brigitte Sindelar, but by adapting the exercises to the specific of the Romanian educational system and by introducing new types and categories of exercises, specifically designed for this purpose

- the introduction of some counseling activities of the class the students with learning disabilities belong to, aimed to improve their image, as a premise for a better participation in learning activities

- proving the important role of teacher in shaping the behavior of children he works with and of the importance of being informed so as we may properly relate to all categories of children.

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