REVIEW

By Assoc. prof. P. Shapkova, PhD

about a dissertation on the topic: **" STRATEGIES FOR TEACHING STUDENTS WITH DYSLEXIA AND DYSCALCULIA "**

for the acquisition of an educational and scientific degree "doctor" in the doctoral program Special pedagogy, in the field of higher education 1. Pedagogical sciences, professional direction 1.2 Pedagogy

Doctoral student: Dimitra Koraka

Scientific supervisor: Prof. Dr. Milen Zamfirov

1. General presentation of the procedure and the PhD student

The author of the dissertation is Dimitra Koraka full-time doctoral student at the Department of "Special Pedagogy" of the FNIO with scientific supervisor Prof. Dr. Milen Zamfirov. The procedure and the presented set of materials are in accordance with the requirements of the RASRB and the Regulations for its application, as well as with the Regulations for the development of the academic staff of Sofia University "St. Kliment Ohridski". Dimitra Koraka has fulfilled all the activities of his individual plan and has been dismissed with the right of defence.

From the presented CV it is clear that the doctoral student has serious practical experience in the field of pedagogy, since from 2010 to today he worked as a mathematics teacher in Greece. The high self-esteem of the doctoral student is impressive, describing herself as a motivating teacher, creating fascinating lessons and a positive learning environment.

2. General characteristics of the dissertation work

The presented development has a volume of 184 pages. In general, the dissertation work is structured in two parts - theoretical and experimental with the corresponding sub-headings and contains conclusions, contributions, conclusion, appendices, as well as a bibliographic reference from 153 literary sources in Latin.

3. **Evaluation of the content of the dissertation**

Relevance of the problem : The doctoral dissertation focuses on an undeniably significant and under-researched problem related to teaching strategies for children with specific learning difficulties.

The topic is rather interdisciplinary, with important scientific-theoretical and practical significance, both for special pedagogy and for elementary pedagogy and speech therapy. The topic chosen by the doctoral student Dimitra Koraka is relevant, as it represents a combination of two interrelated problems, each of which has autonomous significance not only for special pedagogy, but also for inclusive education in general. On the one hand, there is an emphasis on teaching strategies for children with dyslexia, and on the other hand, on teaching strategies for children with dyscalculia.

The theoretical analysis of the problem is constructed based on the interpretation of various literary sources, and is presented through part A (first, second and third chapters).

The doctoral student makes an in-depth analysis of the concept of "dyslexia" by presenting different definitions based on different concepts of representatives of medical science, psycholinguistics, cognitive psychology and neuropsychology about the complexity of this multifactorial phenomenon. Emphasis is rightly placed on contemporary understandings of the nature of dyslexia as a specific learning disability. The importance of the theory of hemispheric differences, etc. is emphasized. A number of features in the neurocognitive development of children that are associated with the condition "dyslexia" have been examined.

Dimitra Koraka pays special attention through content analysis to various educational strategies oriented towards children with dyslexia. Different teaching approaches are described in great detail, such as "multisensory teaching", collaborative learning methods, cooperative learning, teaching metacognitive strategies for reading comprehension, strategies for improvement of non-linguistic parameters,

etc. The role of ICT as a modern educational strategy is emphasized.

In order to enrich the dissertation in terms of content, effective training programs for children with learning difficulties are presented, such as:

- Emphasis on teaching phonological awareness as part of a wider programme;
- Implementing structured programs that are designed to include sequential learning units of short duration;
- Intensive programs on the principle of "little and often";
- Clear and detailed teaching and learning in sequential steps;

- Early intervention;
- Individual educational programs to check the child's progress;
- Programs for the formation of reading skills and spelling;
- Vocabulary development and comprehension strategies;

The doctoral student emphasizes the role of teachers in the classroom teaching process for children with learning difficulties.

In this first part of the dissertation, Dimitra Koraka analyzes in an analogous way the essence of the concept of "dyscalculia", brings out consistently and thoroughly the general characteristics of this specific disorder of the ability to count and analyzes effective educational strategies applied to this group of children with SEN.

The second part of the dissertation, which contains the research design.
The PhD student describes the research approach and research methodology.
Here, the purpose, contingent, stages and methods of the experimental research are correctly described and the research hypotheses are correctly formulated.
It becomes clear that they are a contingent of research 121 boys and girls who are 3rd grade students in 2nd, 3rd and 4th primary schools in the region of Thessaly, in five different classes. For the purposes of the study, students are divided into four separate groups:
a) N=15, Experimental group: Consists of students who scored less than or equal to 140 units on the 1st numerical performance criterion.
b) N=10, Control group: It consists of students who also scored less than or equal to 140 points on the 1st criterion of mathematical skills.
c) N=25, Experimental group and Control group (N15+N10): Includes all students who scored less than or equal to 140 units on the 1st numerical performance criterion.
d) N=96, Students who scored above 140 on the first arithmetic test, excluding those in the experimental group and the control group (N25- (N15+N10).

Students demonstrating significantly lower results than their peers were selected for the study. Approval was obtained from the Ministry of Education to conduct the study in public schools in the region of Thessaly, Greece.

Parental consent has been obtained as the program takes place outside regular school hours. Parents are provided with detailed information about the purpose, structure and potential benefits of the program. The intervention lasts seven weeks, with two school hours per day, except Wednesdays, during extended school hours. Classrooms are prepared to create a conducive learning environment. The arrangement of desks and furniture in the classroom is carefully planned to accommodate the number of children, learning needs and available space. Stability of the arrangement is maintained throughout the program to ensure a conducive and engaging learning environment for students

As the main research methodology, the doctoral student chooses a psychodiagnostic method - an experiment applied in natural conditions with a revealing, ascertaining, verifying and clarifying goal.

A multi-item preliminary psychodiagnostic instrument was used to construct a developmental profile for each child. This test includes scales to measure various skills, including direct memory of sequences, both auditory and visual, through the scales - Memory for Numbers, Memory for Pictures (with semantic visual material) and Memory for Shape (with non-visual material). In order to establish the level of intellectual functioning, a non-verbal method was applied - the Raven test. A working memory measurement scale was also implemented.

The training experiment involved an intervention program lasting six weeks, including two study hours per day, four days per week, for a total of 64 study hours. The first hour focuses on memory exercises, including auditory and visual memory tasks, while the second hour includes game activities tailored to the objectives of the program. The doctoral student describes in detail the stimulus material used to implement the experiment.

4. Evaluation of the results of the conducted research and analysis

Data from the study were analyzed using the SPSS 8.0 statistical software package, and Microsoft Office Excel '97 was used to create graphs.

The results of the empirical study on the individual parameters are illustrated by tables and diagrams with a clear sequence. The PhD student makes a consistent quantitative analysis of the research data.

5. Significance of results and evaluation of contributions

The role of statistical methods in proving research questions is considered.

At the end of the dissertation, the doctoral student draws important conclusions for educational practice and clearly highlights the contributions of the dissertation.

6. Evaluation of the abstract and publications related to the dissertation

The abstract has a volume of 50 pages. The publications presented by the doctoral student are three in number on the topic of the dissertation. The structure of the auto-reference meets the requirements and correctly reflects the results and contributions of the doctoral student's research work.

Based on the careful reading and detailed familiarization with the individual parts of the dissertation, I formulated the following **critical notes and recommendations:**

1. In the introductory part, the scientific problem, as well as the goals and tasks of the research are formulated. The doctoral student outlines the framework of the scientific research and argues the concept of the research, the reasons for choosing the topic, as well as the author's position on the significance of the research problem in the context of modern educational practice.
2. In the first chapter, the doctoral student could emphasize the modern concepts of the essence of the concept of "specific disorders of the ability to learn", presented in ICD-11., effective from 2021. Also, at the very beginning of the development, it is important to emphasize which concept the PhD student will use in the context of the entire development. In this regard, I recommend more clarity on the PhD student's position to use the terms dyslexia and dyscalculia interchangeably.

3. The objectives of the research work should correspond with the topic of the dissertation development. In this regard, I would like to point out that the subject of the doctoral student's research work should be the development of an educational profile and the disclosure of learning strategies for children with dyslexia, in accordance with the topic of the dissertation.

4. In my opinion, the dissertation work could be refined in terms of structure , respecting the classical structure of similar kind of scientific developments.
5. Regarding the research methodology, I believe it would be good to describe in more detail the individual instructions given to the subjects during the study, as well as the

stimulus material used, given the information that children were included in the experimental groups;

6. To clearly distinguish the data from the application of a finding and training experiment in the development, with clearly summarized conclusions at the end. The essence of the experiment is in the search for cause-and-effect relationships in correlated quantities. This is a special method that provides psychodiagnostic data, but this happens not independently, but with the use of other both theoretical methods (for example, hypothesis, etc.) and empirical methods, observation, test, etc.)
7. The doctoral student emphasizes the quantitative processing of the research data, but the qualitative analysis made could be more in-depth. Since the discussion of the results is the essence of the dissertation work, which is related to the analysis of the own results in the context of the literature data, it would be good to more attention is paid to the statistical analysis, through which the established hypotheses are excluded or confirmed. The discussion should summarize what has been achieved so far, what is new to compare with what is already known in the scientific literature;
8. The number of conclusions is usually equal to the number of tasks achieved and therefore it would be good to specify them further.

Conclusion:

Regardless of the critical remarks and recommendations made, I give my positive assessment regarding the quality of the dissertation development and support the awarding of the educational and scientific degree "doctor" on 1.2. Pedagogy (Special pedagogy) of Dimitra Koraka.

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