

STANDPOINT

by Prof. Nataliya Hristova Pavlova, D. Sc.

Department of Algebra and Geometry

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of a dissertation for obtaining of the educational and scientific degree "Doctor"

in the field of higher education 1. Pedagogical sciences

professional field 1.3. Pedagogy of teaching in....

doctoral program Methodology of teaching mathematics

Author: Radka Todorova Zlatanova

Topic: "FORMATION OF CREATIVE THINKING IN STUDENTS IN TEACHING GEOMETRY USING DYNAMIC GEOMETRIC SOFTWARE"

Scientific adviser: Assoc. Prof. Ivailo Peev Staribratov, PhD

1. General description of the presented materials

I was appointed as a member of the scientific jury to provide a procedure for the defense of a dissertation on "Formation of creative thinking in students in teaching geometry using dynamic geometric software" for obtaining the educational and scientific degree 'doctor' in the field of higher education 1. Pedagogical sciences, professional field 1.3 Pedagogy of teaching in..., doctoral program Methodology of teaching mathematics, by order № P33 – 5349 of 22.10.2021 of the Rector of University of Plovdiv "Paisii Hilendarski".

The author of the dissertation is Radka Todorova Zlatanova - PhD student in part-time form at the Department of Methodology of Mathematics and Informatics Education of FMI, with supervisor Assoc. Prof. Ivaylo Peev Staribratov, PhD from Plovdiv University "Paisii Hilendarski" - Plovdiv.

The set of materials on electronic media presented by Radka Todorova Zlatanova is in accordance with the relevant regulations (Art. 36 (1) of the Regulations for development of the academic staff of PU). It contains the necessary materials, including 6 publications on the topic of the dissertation. The documents are neat and well prepared.

2. Relevance of the topic and expediency of the set goals and objectives

The topic of the dissertation is pedagogically significant. The dissertation considers current possibilities for applying research approaches with the help of modern technologies.

3. Knowledge of the problem

The PhD student has studied and analyzed correctly specialized literature on the considered problems. The total number of sources is 73, most of which are in English. The author knows thoroughly the problems both in theoretical and practical aspect, which gives her a good basis for conducting research and developing the dissertation.

4. Research methodology

The methodology chosen by the doctoral student for conducting the research is to a large extent adequate to the set goals and tasks. The methods and means for their realization are well chosen. Didactic tests, surveys and expert assessment were used. The author presents a statistical analysis of the data from a survey conducted in 2020, among students from 11th grade of MG "Acad. Kiril Popov"- A study with bilingual students is also presented.

5. Characteristics and evaluation of the dissertation

The dissertation is structured by an introduction, three chapters, a conclusion, a bibliography and four appendices. The total volume of the book body is 186 pages, of which the main text is presented in 173 pages, with a detailed description of systems of tasks and theoretical and methodological statements, and the rest are set aside for dissertation appendices containing questionnaires, tests and results.

The *introduction* formulates the object, subject, purpose and hypothesis of the study. The main characteristics and specifics of the used software products Sam and GeoGebra, which are used in solving the system of geometry problems, are considered. The summary of the dissertation by chapters is presented.

In *the first chapter*, methodical realizations of creative learning are proposed, with the help of dynamic mathematical software.

The second chapter is dedicated to research-oriented learning, implemented with dynamic mathematical software. The task from the 19th Balkan Youth Mathematical Olympiad, Serbia, 2012 is considered, and the topic "Section of a polyhedron with a plane" is also developed.

The third chapter presents the diagnostic procedure of the study.

In *the conclusion*, Zlatanova summarizes the findings, results and publications. A table is proposed in which the publications and chapters of the dissertation are accentuated, in which the listed contributions have been reached.

6. Contributions and significance of development for science and practice

As the main *scientific* and *applied contributions* we can highlight:

- Proposed, tested and implemented author's methodological tools aimed at applying dynamic geometric software on selected topics in geometry.
- The influence of research-oriented teaching in geometry (through dynamic mathematical software) of bilingual students and students with increased interest in mathematics has been studied.

The main *practical contributions* are concentrated mainly in author's systems of tasks and methodological approaches for using dynamic mathematical software in geometry classes have been developed.

7. Evaluation of dissertation publications

A total of 6 publications on the topic of the dissertation and one report are attached to the dissertation. Zlatanova is a co-author in all publications. It makes a good impression that all presented publications are in renowned scientific and methodological publications, monitored by the Web of Science and other prestigious databases with scientific information. Two of the articles are in English and the rest in Bulgarian.

The quantity and quality of the publications covers the requirements of FMI and exceeds the minimum of 30 points, set in the new regulations for application of the Law on Public Procurement.

8. Personal participation of the PhD student

I believe that the research in this dissertation is the personal work of the PhD student. The work shows the interest and connection of the results with the current position of the author. I have not found plagiarism in the materials submitted to me for review.

9. Abstract

The abstract largely reflects the essence of the theoretical formulation, the conducted research, the obtained conclusions and contributions. The volume of the abstract is 32 pages,

which allows the reader to quickly get acquainted with the ideas and contributions to the dissertation.

10. Critical remarks, questions and recommendations

I do not find significant gaps in the materials provided to me, but I would recommend the doctoral student to continue her work and publish independent scientific papers.

11. Personal impressions

I do not know personally the PhD student - Radka Todorova Zlatanova, but the submitted works and methodological developments present her as a good professional and skilled researcher.

12. Recommendations for future use of dissertation contributions and results

From the presented critical analysis and evaluation of the dissertation it follows that there is an interesting and up-to-date research with practical and applied significance, which can be continued and deepened.

CONCLUSION

The dissertation contains *scientific* and *applied results*, which represent an original contribution to science and meet the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the implementation of LDASRB.

The dissertation shows that the PhD student - Radka Todorova Zlatanova has in-depth theoretical knowledge and professional skills in the scientific specialty Methodology of teaching mathematics, demonstrating qualities and skills for independent research.

Due to the above, I give my *positive assessment* of the research presented by the above peer-reviewed dissertation, abstract, results and contributions, and I *vote for and propose* to the Honored Scientific Jury to award the educational and scientific degree "Doctor" *Radka Todorova Zlatanova* in higher education 1. *Pedagogical sciences, professional field 1.3. Pedagogy of teaching in....., Doctoral program Methodology of teaching in mathematics.*

10.11.2021. г.

Reviewer:

Prof. Natalia Pavlova