

OPINION

of a dissertation work for the acquisition of an educational and scientific degree "doctor"

Author of the opinion:
prof. Dr. Marinela Velikova Mihova, VTU "St. St. Cyril and Methodius"

Scientific field: Pedagogical sciences

Professional direction: 1.3. Pedagogy of training in ...

PhD program: Teaching methodology in biology

University: Sofia University "St. Kliment Ohridski",

Faculty: Faculty of Biology

Department: Teaching methodology in biology

Title of the dissertation: *"Content of Biological Education in the Bulgarian and Californian Education Systems – Comparative Analysis"*

Name of the Phd student: Maya Ivanova Gacheva

The opinion was written on the basis of order RD 38-287/05.06.2024 of the rector of SU "St. Kliment Ohridski".

Data on the PhD student

Maya Ivanova Gacheva graduated in 2003 from the "St. Kliment Ohridski" as a master's degree - molecular biologist. In 2015, he graduated from the MP "Modern Educational Technologies". This additional qualification outlines her future professional career and makes her confident in choosing and developing an integrative comparative education topic for her dissertation research.

From 2015 to the present, Maya Gacheva is a teacher of natural sciences, biology and health education at the American-English Academy and "Abraham Lincoln" Primary School in Sofia. The doctoral student also has research experience. In the period 06.01.2004 - 01.10.2007 she held the position of "specialist" at the Institute of Plant Physiology at the Bulgarian Academy of Sciences.

Data for the Ph.D

By order of the Rector No. RD20-906 dated 05.05. 2022. Maya Gacheva is a doctoral student of self-study in the Department "Methodology of Biology Education" at the Faculty of Biology of the SU "Cl. Ohridski». After a positive decision of the primary unit on the readiness for the defense of the dissertation (protocol No. 508 of 16.04.2024), the rector's order No. RD20-1004/28.05.2024 was issued for the early dismissal of doctoral student Maya Gacheva.

With order RD 38-287/05.06.2024 of the rector of SU, a scientific jury and a date for the defense of the dissertation research were confirmed.

I declare that, given the facts thus presented about the progress of the doctoral studies and the preparation and discussion of Maya Gacheva's dissertation, I do not find any violations in the procedure.

Data for the dissertation and the abstract

The presented dissertation work is structured according to the scientific standards that are required for this type of development. It consists of an introduction, four chapters, conclusions, contributions, recommendations and a conclusion, followed by a list of references

and appendices (in a separate book body). The total volume of the dissertation is 190 pages, of which 176 pages are text. The cited literature (6 pages) includes a total of 77 sources (60 in Cyrillic and 17 in Latin). One part of the literature used is textbooks and study aids for secondary education, which I think could have been singled out on their own. 50 archival documents and Internet resources are noted in notes. The exhibition includes 16 tables and 37 figures.

The dissertation research is the result of the doctoral student's long-term experience as a biology teacher at the American-English Academy, where she simultaneously teaches the Bulgarian and the American (California) education system. The doctoral student's achievement of the idea of scientific interpretation of the accumulated teaching experience in the direction of improving the content of biological education in the Bulgarian educational system based on a comparison with the American (Californian) educational system is proof of her qualitative professional growth.

The dissertation work is interdisciplinary in nature. The research carried out is related to didactics, comparative education and teaching methodology in biology.

Doctoral student Maya Gacheva constructed a clear conceptual framework of the study. She knows what she wants to research, why to do it, what are the stages through which the research should go, and what are the most appropriate methods to achieve the set goal.

As a logical consequence of the chosen research problem, the doctoral student fixed the object of the dissertation research: "the content of biology education in the Bulgarian and California educational systems" (p. 10). The subject of her research is "an analysis of the current models for the content of biology education in the Bulgarian and California educational systems to derive a summary of common characteristics and differences, as well as opportunities for improving the Bulgarian model for the content of biology education" (with . 10). The purpose of the dissertation research is to make a comparative analysis of the concepts of the content of biology education, described through a number of documents and materialized through state-approved resources for implementation (textbooks, study notebooks, books for the teacher, electronic resources and other aids) (p. 11). The research tasks directly correspond to the formulated goal. Adequate research methods have been selected and used to achieve the goal and formulate scientifically based answers to the research questions. The stages of the research are defined very precisely, concretely and with understanding, which is very important for its realization.

Here I would recommend following a certain logical sequence in presenting the elements of the conceptual design of the study. It is illogical to start with a description of research methods without specifying what, from what angle, for what purpose will be studied.

Chapter two is the theoretical framework of the study, which includes the clarification of the concepts of competence approach in education and content of learning as the main construct of didactic issues and a comparison of educational documentation related to the content of biology education in Bulgaria and the USA (state of California). In order to understand this theoretical basis, as well as the subsequent analysis in the third chapter, the clarification made by the doctoral student should be taken into account that "in the present study, the structural-functional relationship between the listed concepts related to the construction of a model of the content of education was sought in a particular area of human cognitive experience. (fig. 3)" (p. 26). Special attention is paid to the specifics of the educational documentation in Bulgaria and the USA (state of California), and the state educational standards in both countries are presented in detail. On the basis of a content analysis, a comparison was made on the defined aspects at the curriculum level and at the level of standards and curricula. What is striking about this chapter is the large volume of direct information from the US documentation that could have been presented in a more focused, more summarized and cognitively hierarchical manner in relation to learning objectives.

The third chapter describes the means related to the implementation of the content of the training in the USA (state of California) and in Bulgaria - textbooks, teaching aids, books for the teacher. They are subjected to analysis based on the normative regulation and the requirements described in didactic-methodical literature in the respective country. The chapter is illustrated with images that confirm the statements made. As a conclusion, a comparison is made on the defined aspects.

In the fourth chapter, the results of the biology training of students who were trained simultaneously in the Bulgarian and California educational systems are presented and analyzed. The results are subjected to statistical processing and are aimed at proving the given hypothesis.

The dissertation research ends by providing answers to the research questions posed in the first chapter. Some of the answers are helpful.

In conclusion, I can summarize that the dissertation work represents a completed theoretical-empirical study with achieved results that lead to the fulfillment of the set goals and tasks.

The text is coherent and logically arranged. The interpretations made are based on very good information and knowledge of the existing educational documentation on the content of biological education in Bulgaria and the USA (state of California).

The abstract correctly reflects the content of the dissertation and corresponds to the requirements.

Publications on the topic of the dissertation research and fulfillment of the minimum national requirements

Three publications on the topic, made during the period of doctoral studies, are presented. One of the publications is in *Pedagogika* magazine, referenced in Web of Science. They adequately represent the individual stages of the doctoral student's research work.

I accept the submitted certificate of compliance with the minimum national requirements for the "Doctor" OCS for area 1. Pedagogical sciences, PN 1.3. Pedagogy of training in ...

Scientific contributions

The context of achievements substantiated by the author and the contributions identified by her correspond to the content of the development and reflect objectively what she achieved as a doctoral student.

The main achievements and contributions of the dissertation research, in my opinion, can be summarized as follows:

Contributions of a theoretical nature

1. An integrative methodological toolkit has been developed for researching the content of biological education, which includes author's aspects of the comparison, implemented at several levels with a corresponding specification, which covers all the main elements of the didactic issues.

2. The educational documentation (educational standards, textbooks, teaching aids) of biological education in the USA (state of California) was analyzed and subjected to a methodical assessment.

3. The main similarities and differences in the concepts of the content of biology education in the Bulgarian and California educational systems are scientifically differentiated.

4. Comparison, analysis and assessment are made of the achievements of the students of biology education in the conditions of education, which is conducted in two languages and according to two national educational standards.

Contributions of an applied nature

1. The methodological toolkit developed and applied in this study can be used for the purposes of future comparative studies in teaching methods in other subjects.
2. As a result of the comparative study, recommendations were formulated for improving the Bulgarian content model of biological education,

Questions for the PhD student:

1. Why is the comparative research method not specified in the research design described in chapter one?
2. Can the doctoral student outline the relationship between the academic achievement of the students demonstrated in the study and the characteristics of the relevant study documentation? That is, is there such a relationship and to what extent is it decisive for their achievements?

Conclusion

The dissertation presented for discussion and defense is the result of well-conducted research that has theoretical and applied significance. The work is well structured, the exposition is consistent and logically consistent and demonstrates the emphasized interest, competence and commitment of the doctoral student to the researched issues.

Positively evaluating the dissertation work and the contributions of the author, I propose to the esteemed jury to award the educational and scientific degree "DOCTOR" to Maya Ivanova Gacheva in the field of higher education 1. Pedagogy; professional direction 1.3. Pedagogy of training in...; doctoral program "Methodology of teaching in biology.

08/05/2024

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Prof. PhD. Marinela Mihova