

STATEMENT

on the Doctoral Dissertation

Methods and tools for research aided learning

Completed for obtaining the educational and scientific degree “Doctor” in the field of higher education: 4. Natural sciences, mathematics and informatics, professional field: 4.6 Informatics and Computer Science, Doctoral Program: „Information Technologies” (Information and Communication Technologies) at the Faculty of Mathematics and Informatics (FMI), Sofia University “St. Kliment Ohridski”

PhD Applicant: Elitsa Vassileva Peltekova, a part-time doctoral student at the Department of “Information Technologies”, FMI, Sofia University “St. Kl. Ohridski”
Supervisor: Prof. Dr. Eliza Stefanova, FMI, Sofia University “St. Kl. Ohridski”
Reviewer: Prof. DSci Ana Proykovala, PhD, Research and Projects Department, Sofia University “St. Kl. Ohridski”

1. General Information

Elitsa Peltekova was a part-time doctoral student at the Department of Information Technologies at the FMI at SU since 2014 and was dismissed with the right of defense by the order No. RD 20-9/30.01.2019. Professional experience: Information security expert, Unit “e- and distance learning” from 2018 at present; Expert “*programs and projects*” within the project “Social innovations for digital skills in the changing labor market”; Master's degree in e-learning, 2009-2011, Sofia University “St. Kliment Ohridski”. She has a bachelor's degree in applied mathematics from the Technical University - Sofia, study period 2005-2009. She was a student at the Free University in Brussels, Belgium, the Erasmus program in 2008. During her doctoral studies, she was a doctoral student in the Erasmus+ program at the Faculty of Applied Mathematics and Informatics, Warsaw University of Natural Sciences (Szkoła Główna Gospodarstwa Wiejskiego), Warsaw, POLAND She is extremely active in international and national research projects - 25 projects from 2017. Recently she has joined the communication team of the project European Master For High Performance Computing (EUMaster4HPC 2022-2026), financed under the Horizon2020 program.

2. Analysis of the content, results and contributions of the dissertation

The dissertation was completed in the field of teaching methodology in informatics and information technologies. The goal was to establish a way to increase the interest and results of learners, as well as to develop a methodology (model system) for building educational scenarios. The subject and research questions were clearly formulated. To achieve the main goal, 4 tasks with two specific sub-tasks were defined.

The dissertation is written on 184 pages, structured in an introduction, five chapters, conclusion, 67 figures and 15 tables, 9 appendices, author reference (self-reporting) of scientific publications and participation in scientific research projects, references to 150 articles, books, electronic pages (URL), reports in English and Bulgarian.

The introduction is devoted to the topicality of the problems and poses five research questions, which are investigated within the framework of a fairly broad literature review.

The first chapter examines the methods: research approach in teaching, scientific research in pedagogy (experiment, demonstration), collection of research data (surveys, interviews). In the second chapter there is an overview of the tools (technologies) used – mobile technologies, interactive whiteboards and virtual reality technology, which are part of the experiments and studies of the dissertation. In the third chapter, the studies carried out as work on the dissertation are described, regarding the applicability of the methods and means in Bulgaria.

In the fourth chapter, a model for searching, finding, creating educational learning scenarios is proposed, which is based on a service-oriented architecture. The creation of the model aims to facilitate teachers in using more diverse methods and means in teaching.

The fifth chapter describes developed scenarios for subjects in the field of STEM (Science, Technology, Engineering, and Mathematics) - "Man and Nature", "Physics and Astronomy". The scenarios were experimented with: (A) PhD students and scientists from Sofia University "St. Kliment Ohridski" within the international weSPOT project and (B) students, teachers, teacher trainers within the European Night of Scientists in 2018, 2019 and 2020. Validation of the scenarios with practicing teachers was carried out. Challenges are highlighted and conclusions drawn.

The dissertation is well structured and adequately illustrated. The presentation is clear, comprehensive and balanced. The author reference summarises the scientific and scientific-applied contributions and objectively presents the publications and scientific projects and programs related to the dissertation work.

3. Publications that reflect the dissertation. Reflection of the results of the dissertation in the works of other authors

All main results of the dissertation are published in 12 papers in the period 2014-2021 (Google scholar), of which 5 publications are indexed in Scopus. Ms. Peltekova is a co-author of all publications and there is no doubt about her contribution to the publications. Currently, Google scholar has registered 20 citations of these publications with informal attribution.

4. Critical notes and recommendations

I have no significant notes or recommendations.

5. Abstract (Resume)

The abstract has been prepared in accordance with the requirements of the Regulations for the terms and conditions for acquiring scientific degrees and for occupying scientific positions at the FMI, SU. The abstract fully, comprehensively and accurately reflects the content of the dissertation, as well as the main scientific and applied contributions.

6. Conclusion

Based on the presented materials quality, scientific papers, their significance, and the scientific and applied contributions, my opinion is that the candidate *Elitsa Vassileva Peltekova* **meets all** requirements for acquiring the educational and scientific degree "Doctor" at the Sofia University "St. Kliment Ohridski" in the professional field 4.6 Informatics and Computer Science.

I recommend to the esteemed Scientific Jury to award *Elitsa Vassileva Peltekova* the scientific degree of Doctor in Professional Field 4.6. "Informatics and Computer Science" at the Sofia University "St. Kliment Ohridski".

16.09.2022

Prof. DSci Ana Proykova, PhD