

# OPINION

by assoc. prof. Margarita Nikolaeva Terziyska, PhD  
University of Food Technology, Plovdiv,

of a dissertation for awarding 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 "Informatics"

**Author:** Vladimir Hariev Tsvetkov

**Topic:** „Adaptivity in an e-learning system based on pedagogical patterns“

**Scientific supervisor:** Assoc. Prof. Stanka Ivanova Hadzhikoleva, PhD – University of Plovdiv “Paisii Hilendarski”

## 1. . General presentation of the procedure and the PhD student

By order No. RD-21-653/21.03.2024 of the Rector of the University of Plovdiv “Paisii Hilendarski” I have been appointed as a member of the Scientific Jury in connection with the procedure for acquiring an educational and scientific degree "Doctor " by the field of higher education 4. Natural sciences, mathematics, and informatics, professional direction 4.6 Informatics and computer sciences, doctoral program Informatics by Vladimir Hariev Tsvetkov with a dissertation on Adaptability in an e-learning system based on pedagogical patterns, supervisor Assoc. Dr. Stanka Ivanova Hadzhikoleva.

As a member of the Scientific Jury, I have received:

- a request to the Rector of the PU to disclose the procedure for the defense of a dissertation work;
- CV in European format;
- protocol from the departmental council related to reporting the readiness to open the procedure and preliminary discussion of the dissertation work;
- dissertation work;
- abstract;
- list of scientific publications on the topic of the dissertation;
- copies of scientific publications;
- declaration of originality and authenticity of the attached documents;
- certificate of fulfilling the minimum national requirements for acquiring a scientific and educational degree "doctor".

In evaluating the dissertation work, the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LAD), the Regulations for its Implementation (PPZRASRD), and the Regulations for the Development of the Academic Staff of the PU (PRASPU) and the specific requirements of the FMI should be taken into account. The main norms that must be observed are:

1. According to Art. 6(3) of ZRASRB "the dissertation must contain scientific or applied scientific results that represent an original contribution to science. The dissertation must demonstrate that the candidate possesses in-depth theoretical knowledge of completed skills and abilities for independent research".

2. According to Art. 27(2) of PPZRASRB, the dissertation must be presented in a form and volume that meets the specific requirements of the primary unit. The dissertation must contain the title page; content; introduction; exposition; conclusion – summary of the obtained results; and bibliography.

The dissertation fully meets these requirements, consisting of a title page, table of contents, introduction, four chapters, conclusion, contributions of the doctoral student, and a bibliography.

3. According to Art. 36, para. 1 of the PRASPU, the specific requirements of the FMI to the PU with the candidate to have:

- minimum four publications in peer-reviewed publications;
- minimum one publication in a journal.

The PhD student has submitted seven publications related to the dissertation work, all of which are in peer-reviewed editions, and two of them are in abstracts.

## **2. Relevance of the topic**

The use of pedagogical patterns is an extremely topical thematic direction in the modern educational environment. Their application could help educators personalize the educational process, create more suitable learning environments, provide engaging and interactive learning, as well as a high degree of adaptation in various aspects. This includes adaptation to learning in a virtual environment, adaptation in terms of integrating modern technologies in the educational process, adaptation in the formation of 21st-century competencies in students, and adaptation to learners with specialized needs that require an individualized approach to learning.

## **3. Knowledge of the problem**

The PhD student shows a good knowledge of the issues and is familiar with the topic of the dissertation research. Proof of this is a literature review created by him. A total of 139 sources are cited in the dissertation, which are from 121 publications and books and 18 Internet sources. The main part of them (126) are in Latin, and 13 - in Cyrillic. The list of cited literary sources is not particularly up-to-date - only 56 of the cited sources are from the last 10 years. At the same time, it also shows significantly older references but appears fundamental to the subject.

## **4. Research methodology**

I consider that the methodology used by the doctoral student to achieve the formulated goal and corresponding tasks is expedient and suitable for the successful implementation of the research.

## **5. Characteristics and evaluation of the dissertation and contributions**

The dissertation has a total volume of 143 pages, of which 117 pages are the main text. It consists of an introduction, four chapters, a conclusion, a list of cited literature, a list of publications

related to the dissertation, a list of contributions claimed by the dissertation student, and a list of noted citations.

Chapter One is an introduction to the subject area of the study. It is dedicated to pedagogical patterns, introducing several basic concepts, commenting on the types of patterns, languages for pedagogical patterns, software tools, and repositories used to store pedagogical patterns. Also, all adaptability of learning and individuality of learners in learning and perceiving types of information are considered. The purpose and tasks of the dissertation are formulated.

In the second chapter, a conceptual framework of a pedagogical parent-based e-learning system is proposed; application architecture, as well as its main modules, functionalities, and types of users; model of a pedagogical model applicable in an e-learning environment. This instance of the concept of pedagogical pattern is introduced.

Chapter 3 presents the development process of a software plugin for the Moodle e-learning environment and describes the main functionalities of the software prototype.

Chapter 4 presents the results of the use of pedagogical parents in training.

I accept the contributions to the dissertation as presented by the author.

**Scientific contributions:**

1. A conceptual framework of a learning system based on pedagogical patterns has been created.

**Scientific and applied contributions:**

1. A pattern model has been developed, which sets a framework for an abstract description of pedagogical patterns;
2. A pedagogical pattern instance model suitable for software implementation is proposed.

**Applied Contributions:**

1. A Moodle plugin has been developed for working with pedagogical patterns;
2. Practical examples of the use of pedagogical patterns are developed through Moodle's standard learning activities and resources.

**6. Evaluation of the publications and personal contribution of the doctoral student**

In connection with the dissertation, the candidate has submitted 7 publications. All of them are co-authored, and the PhD student is the first author in two of them. Publication No.1 is in a publication indexed in Web of Science and publication No.4 is in a publication indexed in Scopus (SJR=0.632). The dissertation student participated in 4 conferences and/or research and educational seminars, where he reported the results of the dissertation, and also in three university projects. There is data for seven citations in the presented materials. This gives me reason to believe that the author has developed the skills to work in a team, to present the results of the dissertation work to a wide range of specialists, and to write high-quality scientific articles.

**7. Abstract**

The submitted abstracts in Bulgarian and English are 32 pages long and are structured following the dissertation work.

## **8. Recommendations for future use of dissertation contributions and results**

I have no critical notes. To improve the quality of the dissertation and consider future research on the topic, I have the following notes and recommendations:

1. There are some stylistic inaccuracies in the text, as well as some technical errors.
2. I recommend the dissertation student pay more attention to independent publications as well as to those in English.
3. I also recommend that he refer to more modern sources in his future work.

## **CONCLUSION**

I accept that the presented dissertation fully meets the set of criteria and indicators for the acquisition of the educational and scientific degree "Doctor", according to the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation and the Regulations on the conditions and procedures for the acquisition of scientific degrees and holding academic positions at PU "Paisii Hilendarski" and the Faculty of Mathematics and Informatics. The dissertation shows that the doctoral student Vladimir Hariev Tsvetkov possesses in-depth theoretical knowledge and professional skills in the scientific specialty of Informatics and Computer Sciences, demonstrating qualities and skills for independent conduct of scientific research. Therefore, I give my positive assessment and propose to the scientific jury to award Vladimir Hariev Tsvetkov the educational and scientific degree "doctor" in professional field 4.6 Informatics and computer sciences, the doctoral program "Informatics".

19.04.2024

**Signature:** .....

/ assoc. prof. M. Terziyska, PhD/