

# OPINION

by Assoc. Prof. Delyana Dimcheva Dimova, PhD  
Agricultural University - Plovdiv

of a dissertation for awarding educational and scientific degree “Doctor”(Ph.D)

in the Area 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 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 was appointed as a member of the scientific jury in a procedure for the defense of the dissertation work on „ Adaptivity in an e-learning system based on pedagogical patterns” for obtaining the educational and scientific degree "Doctor" in the area of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6 Informatics and Computer Sciences, doctoral program Informatics. The author of the dissertation is Vladimir Hariev Tsvetkov - a full-time PhD student at the Department of Computer Informatics, with scientific supervisor Assoc. Prof. Stanka Hadzhikoleva, PhD; University of Plovdiv “Paisii Hilendarski”. The set of materials presented by Vladimir Tsvetkov is in accordance with Article 36 (1) of the Regulations for Development of the Academic Staff of Plovdiv University "Paisii Hilendarski".

PhD student Vladimir Tsvetkov received a Master's degree at the Faculty of Mathematics and Informatics at the University of Plovdiv “Paisii Hilendarski”. He speaks English, German and Russian.

## 2. Relevance of the topic

The adaptivity of education is crucial concerning the quality and effectiveness of learning. The digital environment offers many temptations that attract attention, and it is increasingly challenging to offer attractive training that satisfies learners. This sets specific requirements for designing the educational process in a way that intrigues learners. In this context, the issue under consideration in the current dissertation is topical and interesting.

The main goal of the dissertation work is to explore the possibilities of using pedagogical patterns in e-learning and to develop new models and tools with pedagogical patterns to optimize the

learning process, facilitate the work of teachers, and assist learners in acquiring new knowledge and skills. In order to achieve that indicated purpose, five tasks have been formulated.

### **3. Knowledge on the problem**

PhD student Vladimir Tsvetkov knows the field of research very well. The list of used references includes 132 sources. A significant part of them are in English..

### **4. Research methodology**

The dissertation research was carried out according to the following scheme: a study of theories, models, and systems related to the application of pedagogical patterns in e-learning; creation of a conceptual model for the use of pedagogical patterns; designing and developing a software prototype of a tool for modeling pedagogical patterns in an e-learning environment; development of practical examples of using pedagogical patterns in e-learning.

The methodology applied by PhD student Vladimir Tsvetkov is suitable for the purpose of the dissertation research.

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

The dissertation consists of 141 pages, divided into an introduction, four chapters, a conclusion, a list of author's publications on the subject, a list of citations, a list of abbreviations, a list of figures, a list of used references and declaration of originality. The list of used references includes 132 sources, 12 of which are in Cyrillic and 120 in Latin.

Chapter 1 provides an in-depth study of the types of pedagogical patterns, languages for pedagogical patterns, and software tools and repositories that use and store pedagogical patterns is conducted. Different types of adaptivity in learning and the individuality of learners regarding learning and information perception are discussed, including different learning styles. Chapter 2 presents a conceptual framework of an e-learning system based on pedagogical patterns. Chapter 3 presents the development process of a software plugin for the Moodle e-learning environment. The main functionalities of the software prototype are described. Chapter 4 presents the results of the study on the use of pedagogical patterns in education. Practical ideas for specific pedagogical patterns are proposed. The Conclusion provides an overview of the work done, the tasks planned and executed. Prospects for future development of the dissertation topic are formulated.

The main contributions of the dissertation can be characterised as scientific, scientific-applied, and applied. The scientific contributions of the dissertation research are: a conceptual framework for a learning system based on pedagogical patterns has been created. Scientific and applied contributions are: a pattern model which sets a framework for the abstract description of pedagogical patterns has been developed; a model of a pedagogical pattern instance suitable for software implementation has been proposed. The applied contributions of the dissertation research are the following: a plugin in Moodle for working with pedagogical patterns has been developed; practical examples of using pedagogical patterns through Moodle's standard learning activities and resources have been developed.

## **6. Assessment of the publications and personal contribution of the PhD student**

PhD student Vladimir Tsvetkov has presented 7 publications related to the topic of the dissertation work. Two publications are in specialized journals. The first of them is indexed in Web of Science (IF=0.8), and the second in Scopus (SJR=0.632). These two publications bring the author a total of 48 points. Thus, the requirement for acquiring the educational and scientific degree "doctor" for a minimum of 30 points from group "G" in professional field 4.6 Informatics and computer science is fulfilled. Five of the mentioned works are presented in conference proceedings. All publications are co-authored. The doctoral student has participated in three scientific research projects. The presented citations are seven.

## **7. Abstract**

The abstract is made according to the requirements and fully reflects the content, the main results and contributions of the dissertation work.

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

I would recommend the PhD student Tsvetkov to present independent publications of his future research related to the considered dissertation topic.

## **CONCLUSION**

The dissertation contains scientific, scientific-applied and applied results, which represent an original contribution to science, and meets all the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its application, and the corresponding Regulations of the University of Plovdiv „Paisii Hilendarski”.

The dissertation shows that the PhD student Vladimir Tsvetkov has in-depth theoretical knowledge and professional skills in scientific speciality Informatics, demonstrating qualities and skills for independent conduct of scientific research.

Due to the above, I confidently give my positive assessment of the research presented by the above-reviewed dissertation, abstract, results and contributions, and I propose the highly respectable Scientific Jury to award the educational and scientific degree "Doctor" to Vladimir Hariev Tsvetkov in the area of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6 Informatics and Computer Sciences, doctoral program Informatics.

17.04.2024

**The opinion worked out by:** .....

Assoc. Prof. Delyana Dimova, PhD