

OPINION

from **NIKOLAI ATANASOV SHOPOV, PhD**
associate professor at the **Department of Computer Systems and Technologies**
of the Faculty of Engineering,
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for a dissertation for awarding the educational and scientific degree "**doctor**"

Field of higher education: **5. Technical sciences**

Professional area: **5.3. Communication and Computer engineering**

Doctoral program: **Automatization of areas in the intangible sphere (medicine, education, science, administrative work, etc.)**

Author: **Tsvetelina Lachezarova Ivanova-Varadinova**

Title: **System of technology-based decisions in engineering education**

Adviser: Assoc. Prof. Nadezhda Kafadarova, PhD – Plovdiv University "Paisii Hilendarski"

1. General presentation of the procedure and the PhD candidate

By order № RD-21-719/04.04.2024 of the Rector of Plovdiv University "Paisiy Hilendarski" I have been appointed as a member of the scientific jury in the procedure for the defense of a dissertation on the topic "**System of technological-based decisions in engineering education**" for acquiring the educational and scientific degree "doctor", Field of higher education: 5. Technical sciences Professional area: 5.3. Communication and Computer engineering, doctoral program: Automation of areas in the intangible sphere (medicine, education, science, administrative work, etc.) author of the dissertation is **M.Sc. Tsvetelina Lachezarova Ivanova-Varadinova**. The set of paper materials presented by the doctoral student is in accordance with Article 36 (1) of the Regulations for the Development of the Academic Staff of the PU and PP of the LDAS in the Republic of Bulgaria. The PhD student has attached 8 publications on the subject of the dissertation.

M.Sc. Tsvetelina Lachezarova Ivanova-Varadinova completed her secondary education in 2012 at the PGHP "St. St. Cyril and Methodius" - Plovdiv. In the following years, she studied at Plovdiv University "Paisiy Hilendarski" - Plovdiv, graduating from OQD "Bachelor" majoring in "Information Physics and Communications" and OQD "Master" "Physics Teacher". On 04.02.2020, she was enrolled as a full-time PhD student, and since July, the same year, she has been an assistant at Plovdiv University "Paisii Hilendarski. In my opinion, the colleague has the necessary pedagogical experience.

I don't know m. Sc. Tsvetelina Lachezarova Ivanova-Varadinova in person, but I think that she is successfully developing in the field of information technologies, constantly improving her knowledge and skills.

2. Relevance of the topic

In recent years, there has been active work in the field of digitization in the sphere of education, especially higher education. As a result of the past COVID-19 pandemic, it was necessary to switch to online learning. This imposed a number of restrictions, the most affected aspect being education with a practical orientation. This also applies to engineering education.

The development of modern technologies provides opportunities for interactive learning. Modern educational technologies - applications, models, simulations, etc. engage students' attention, stimulating them in the learning process. These technologies provide an opportunity for easier assimilation of the material with the possibility of remote access to educational resources. The presented dissertation is aimed at the digitization of education in the engineering specialties of Plovdiv University "Paisiy Hilendarski" and responds to modern trends in practical-oriented learning. I believe that the topic developed in the proposed dissertation is interdisciplinary and covers both pedagogical and engineering fields.

I believe that the problem under consideration is relevant.

3. Knowledge of the problem

The PhD student Tsvetelina Lachezarova Ivanova-Varadinova has cited 92 literary and informational sources, of which 7 are in Cyrillic, and the rest are in English (86%). It should be noted that 37% of the cited sources were published in the last ten years.

From the list and analysis of the cited literary sources, it can be concluded that the PhD student has understood the current state and trends in the development of the problems solved in the dissertation work.

4. Research methodology

The dissertation is 164 pages long, with three appendices added - 64 pages. It is organized into an introduction, four chapters, a description of the contributions, a list of the PhD student's publications and a bibliography (references).

In Chapter I of the dissertation, an analysis of teaching methods and technology-based methods in engineering education is made. The previous experience in this direction at Plovdiv University "Paisiy Hilendarski" was also examined.

An analysis of the problem has been carried out, defining the goals and tasks of the dissertation.

In Chapter II, a model of technology-based decisions in engineering education is presented.

The PhD student Ivanova-Varadinova, has devoted Chapter III to the development and testing of a remote access system for conducting laboratory exercises in real time.

Chapter IV "Analysis of the results" presents the results of the training of students from Plovdiv University "Paisiy Hilendarski" with the developed model of technology-based decisions, applied in the laboratory exercises in the discipline "Electronics".

5. Characteristics and assessment of the dissertation work and contributions

After thoroughly familiarizing myself with the dissertation work and publications of PhD student Tsvetelina Lachezarova Ivanova-Varadinova, I am convinced that the results achieved from the research and development carried out, were obtained entirely with her participation. With the work presented, the PhD student demonstrates her knowledge and skills for in-depth research and solving scientific problems of a scientific-applied and applied nature.

After getting acquainted with the applied scientific works of M.Sc. Ivanova-Varadinova, I believe that the developed ideas and the obtained results have become available to the scientific circles in our country through the publications and reports presented at conferences in the state and abroad.

In the self-assessment of contributions presented by the PhD student, a total of 5 items are formulated, which are classified as scientifically-applied. I believe that the presented contributions accurately reflect the results obtained by the PhD student Tsvetelina Lachezarova Ivanova-Varadinova.

In my opinion, the contributions are scientifically-applied and applied, being in the field of digitization of engineering education and distance learning of students.

In my opinion, the contributions are about adapting known methods and algorithms and creating new models and software in a dynamically developing field.

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

The results obtained during the development of the dissertation work are presented in eight publications. Two of the publications are independent, and in five of the others PhD student Ivanova-Varadinova is first author. I believe that the PhD student's dissertation publications reflect the main contributions she claims to have made.

7. Abstract

The submitted abstract is 32 pages long and meets the requirements for its preparation. It correctly reflects the main results and contributions of the dissertation work.

8. Recommendations for the future use of the dissertation contributions and results

I have the following recommendations for future work:

–To improve publication activity in publications that are referenced and indexed in global databases (Scopus, WoS, etc.).

–Expanding the samples of students who use the methods discussed in the dissertation.

–In the evaluations of the students, the evaluation unit should be recorded - grade and scale, number of points, etc.

These recommendations do not relate to the essence of the contributions, therefore they do not affect my personal positive impression of the scientific production and other merits of the PhD student.

CONCLUSION

After thoroughly familiarizing myself with the dissertation work and publications of doctoral student Tsvetelina Lachezarova Ivanova-Varadinova, I am convinced that the results achieved from the research and development carried out, were obtained entirely with her participation. With the work presented, the doctoral student demonstrates her knowledge and skills for in-depth research and solving scientific problems of a scientific-applied and applied nature.

The dissertation **contains scientific-applied and applied results, which represent an original contribution to science and meet all** the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of LDASRB and the relevant Regulations of Plovdiv University "Paisii Hilendarski".

Based on the analysis, I give a positive assessment of the dissertation work and consider it justified to offer a **M.Sc. Tsvetelina Lachezarova Ivanova-Varadinova** to acquire the educational and scientific degree "doctor" Field of higher education: 5. Technical sciences Professional area: 5.3. Communication and Computer engineering, doctoral program: Automation of areas in the intangible sphere (medicine, education, science, administrative work, etc.)

08.05.2024
Plovdiv

Prepared the opinion:
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