

OPINION

by Prof. Dr. Vladimir Monov

member of the Scientific Jury according to Order No. 208/20.07.2022
of the Director of the Institute of Mathematics and Informatics - BAS

ABOUT

dissertation work for obtaining the educational and scientific degree "doctor"

Author of the dissertation: **M.Sc. Nektarios Moumoutzis**

Dissertation topic: **"Operational conceptual modeling in building and maintaining virtual communities"**

Field of higher education: **4. "Natural sciences, mathematics and informatics"**

Professional direction: **4.6. Informatics and Computer Science,**

Doctoral program: **"Informatics"**

Scientific supervisor: **Prof. Dr. Radoslav Pavlov**

General characteristics of the dissertation work

The dissertation is in English in a volume of 164 pages and consists of Introduction, 5 chapters and Conclusion. 6 contributions of the dissertation have been formulated. The list of bibliographic sources contains 108 titles in Latin. The list of publications on the topic of the dissertation consists of 16 publications. Lists of figures, tables and used abbreviations are systematically attached to the dissertation work. Two applications containing a game representation of binary numbers and performing the four arithmetic operations with them are also given.

The abstract is presented in Bulgarian and English in a volume of 38 and 30 pages, respectively, and it essentially reflects the goals set, the results obtained and the contributions of the dissertation work.

Relevance of the problem developed in the dissertation in scientific and scientific-applied terms.

The topic of the dissertation is related to the development and implementation of information and communication technologies for the purposes of learning and building knowledge within virtual social and technological communities. The main emphasis of the problem developed in the dissertation

is the use of the idea of community and the development of onlife communities through modern digital technologies, enabling training and acquiring knowledge related to the interests of learners in a given field. This approach goes beyond the capabilities of traditional teaching and communication systems by placing learners at the center of learning and allowing them to become creators of new content using accessible technological tools and materials. All this undoubtedly determines the innovative and up-to-date nature of the conducted research, as well as the usefulness of the scientific and scientific-applied results obtained in the dissertation.

Degree of knowledge of the state of the problem and creative interpretation of literature material

In the dissertation, a literature review and in-depth analysis of modern approaches to creating and maintaining social and technological communities through the development of platforms and tools supporting communities for learning, creative activity and practical activity is presented. A study is made on the possibilities and prospects for the development of the multimedia e-learning environment Coursevo, the ViSTPro learning tool allowing the visualization of spatio-temporal processes, the digital creativity tool eShadow, inspired by the tradition of the Shadow Theater, as well as the general structural framework PerFECt for creating and maintaining computer science teaching and learning communities. The overview material of the dissertation shows an in-depth knowledge of the matter and current problems in the field, as well as the possible approaches to their solution. On this basis, the general goal and the specific tasks of the dissertation are well motivated and formulated.

Correspondence of the chosen research methodology and the set goal with the achieved results

In the dissertation, a methodological approach was used, including identification of the object and subject of investigation, research and analysis of the possibilities of modern digital technologies to promote creativity and learning within the framework of technological and social connectivity, implementation and evaluation of the results of the conducted research. Within this approach, an architectural structure based on the PerFECt platform has been developed for creating and maintaining learning communities in real life, experimental results have been performed that show the effectiveness of the presented software developments and learning projects. The obtained results show that the doctoral student has successfully used the chosen research apparatus to achieve the goals of the dissertation and obtain new results with a scientific-applied and practical contribution.

Contributions of the dissertation work

I accept and positively evaluate the contributions formulated in the dissertation and the abstract. In summary, they can be listed as follows.

- Key concepts and principles of modern digital technologies are developed, promoting creativity and learning and focusing on the development of computer-supported collaboration of all participants.
- An architectural structure based on the PerFECt platform has been developed for creating and maintaining Onlife communities, including models and specific guidelines for using digital systems and creating new opportunities in these communities.
- The tools of the eShadow digital creativity system, inspired by the Greek traditional theater of shadows, have been enhanced with capabilities to establish and maintain communities in the digital cultural heritage.
- The capabilities of the ViSTPro platform for visualization of spatio-temporal processes in various fields, such as cultural heritage and history education, have been developed and improved.
- Applications of the Coursevo platform are implemented for community building, distance learning and practice in programming and computer science.
- Practical guidelines for implementation and experimentation with the proposed structures and services for building and developing communities have been developed.

Assessment of dissertation publications

16 publications on the dissertation work co-authored by the doctoral student and published in the period 2018-2022 are presented. All publications are in English, 14 of them are in issues indexed in the Scopus and/or Web of Science databases. Five of the publications are in SJR editions, with 4 of them in the Scopus Q4 quartile. The author's developments have been used in projects financed by the EU and by national funds and have also been presented in the delivered reports at scientific conferences. No data on observed citations are presented. The publications on the dissertation and the presented scientific reports reflect the essential parts and the main results of the conducted research. With this, the results of the dissertation have become available to our and the international scientific community. In terms of their content and volume, the presented publications significantly exceed the normative requirements for obtaining the educational and scientific degree "doctor".

Opinion, recommendations and remarks

The dissertation has been thoroughly and precisely developed and represents a complete research work. A systematic study of the problem was carried out, as a result of which original results and modern technological solutions were proposed for the construction and development of virtual communities in the conditions of social and technological connectivity. The obtained results fully correspond to the set goal and tasks of the dissertation.

I have no substantive critical comments on the dissertation and the presented results. It could be noted that all dissertation publications are co-authored, which indicates built-in teamwork capabilities. Given the future publication activity and the possibilities of the doctoral student to successfully conduct scientific research, I would also recommend the preparation and publication of independent publications in prestigious international publications.

CONCLUSION

I positively assess the work done and the results obtained in the dissertation. The dissertation meets all the requirements of the Law for development of the academic staff, the Regulations for its implementation, as well as the Regulations for the terms and conditions for acquiring scientific degrees and occupying academic positions at IMI-BAS. I strongly suggest to the respected Scientific Jury to give the M.Sc. Nektarios Moumoutzis the educational and scientific degree "doctor" in the field of higher education: 4. "Natural sciences, mathematics and informatics", professional direction: 4.6. Informatics and Computer Science.

Sofia

16.09.2022 г.

Compiled by:

/ Prof. Dr Vladimir Monov/