

REVIEW

**for the competition for the academic position
„Professor“
in the professional field 4.6 Informatics and Computer Science,
for the needs of the New Bulgarian University,
Department of Informatics,
announced in Newspaper of State No. 23 from 19.03.2021
and on the Internet pages of NBU**

The review is written by **Prof. Georgi Petrov Dimitrov, PhD, Vice dean of the Information Science Faculty at University of Library and Information Technologies** as a member of the Scientific Jury for the competition, established by Order No. 3-PK-155 / 29.04.2021r of the Rector of the New Bulgarian University.

1. GENERAL PRESENTATION OF THE RECEIVED MATERIALS

Presentation of the procedure and inventory of the materials received for review.

Subject

With order № 3-PK-155 from 29.04.2021 of the Rector of New Bulgarian University (NBU) I have been appointed a member of the scientific jury of a competition for the academic position of **‘professor’ at NBU** in the field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.6. Informatics and Computer Science, **announced for the needs of the Department of Informatics.**

An only candidate has submitted documents for participation in the announced competition: Assoc. Prof. Dr. Georgi Teoharov Tuparov from the Department of Informatics.

The set of materials presented by Assoc. Prof. Dr. Georgi Teoharov Tuparov is in accordance with the Ordinance for the development of the academic staff of NBU, and includes the following documents:

- CV
- Diploma for Master degree in engineering.
- Diploma for holding a scientific-educational degree "Doctor".
- Diploma for the academic title "Associate Professor" with a printout from the NACID registration system with scientometric indicators in Professional field 4.6.

- Self-assessment report on the fulfilling of the minimum national requirements and the requirements of the NBU.
- Reference for the original scientific contributions with which he participated in the competition.
- Diploma from NBU for proficiency in English at level B2
- Certificate of work experience in the academic area
- Evidence to the self-assessment report and the reference for original scientific contributions.

The candidate Assoc. Prof. Dr. Georgi Teoharov Tuparov has submitted 23 scientific works, of which 1 monograph, 1 book chapter, 20 indexed articles and 1 article with forthcoming indexing in Scopus, Clarivate Analytics Web of Science, ACM Digital Library and IEEE eXplore Digital Library

I accept for review the publications submitted for participation in the competition. Documents for participation in research projects are also presented as follows: Participation in 13 international, national, regional and university projects, being the leader of one national project and the leader of the Bulgarian team of one international project.

2. BRIEF BIOGRAPHICAL DATA

From 1990 until 2016 Assoc. Prof. Dr. Georgi Teoharov Tuparov has worked as a full-time lecturer or researcher at the Technical College, Faculty of Natural Sciences and Mathematics of SWU “N. Rilski” and the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences, passing successively through various positions. As a part-time lecturer, he has taught courses at University College of Dublin, Ireland, American University in Bulgaria and New Bulgarian University.

He was elected associate professor by decision of the Higher Attestation Commission 24071 of 05.02.2007.

Since 2016 he has been working as a full-time lecturer at the Master's Faculty of the New Bulgarian University and continues to be a part-time lecturer at the American University in Bulgaria.

3. GENERAL CHARACTERISTICS OF THE CANDIDATE'S ACTIVITY

To date, NBU Assoc. Prof. Dr. Georgi Teoharov Tuparov has prepared and led lectures in the following disciplines: Client-server information systems, Modeling with UML, Practice in programming and Internet technologies, Practice in programming and implementation of databases, Project: Databases and SQL, Independent work: Databases, Object-oriented programming with UML, Databases and SQL, Database programming, Project: Database programming, Database

administration, Design of business information systems, PL / SQL programming, PL / SQL project, Web application development with Oracle technologies, Web application project with Oracle technologies, Oracle databases - basics of administration, Distributed databases, Distributed database applications, Individual work: Distributed databases.

In his lecture activity Assoc. Prof. Dr. Georgi Teoharov Tuparov is a highly competent and demanding teacher, applying new technologies in education. He actively works with doctoral students and graduates. He is a research supervisor of one successfully defended doctoral dissertation and a large number of defended diploma theses.

EVALUATION OF THE SCIENTIFIC AND SCIENTIFIC-APPLIED ACTIVITY OF THE CANDIDATE

Assoc. Prof. Dr. Georgi Teoharov Tuparov has a diverse scientific and scientific-applied activity, which can be seen from the total number of publications - 120. For the competition are presented 23 scientific works (21 of which are indexed in world-famous databases with scientific information Web of Science, SCOPUS, ACM and / or IEEE Explorer), 1 monograph and 1 chapter of a book. The presented materials do not repeat others used in previous procedures for obtaining the educational and scientific degree "Doctor" and for holding the academic positions "Chief Assistant" and "Associate Professor".

The presented publications can be systematized by areas as follows:

- Modeling and development of sustainable extensions of the functionality of open source e-learning systems.
Works: 1, 2, 3, 4, 5, 6, 10, 11, 16, 23
- Frameworks for description and analysis of functionalities of open source e-learning systems. Comparative analyzes.
Works: 6, 10, 11, 23
- Educational computer games and gamification
Works: 11, 16, 17, 18, 20, 21, 23
- Mobile learning - analysis, modeling and implementation in countries in conditions of military conflict.
Works: 8, 9, 13
- Study of stakeholders in the e-learning ecosystem.
Works: 3, 7, 8, 9, 12, 14, 15, 16, 19
- Development of e-learning
Works: 13, 22, 23

Accepting the statements in the author's reference, I would summarize the candidate's contributions in groups, as presented below.

1. Modeling and development of sustainable extensions of the functionalities of open source e-learning systems.

The contributions in the publications related to this area focus on the analysis of the possibilities for sustainable development of the functionalities of open source systems and development of approaches and models for creating sustainable micro-extensions of these systems that solve various specific needs of the online educational process. A critical analysis of various approaches, including e-learning standards and specifications, has been made and the possibilities for their use to expand the functionality of open source e-learning systems have been identified [4, 6, 10, 11, 23]. In theoretical aspect, models and approaches have been created for:

- model for implementation of the "jigsaw" method [1, 2] and of modules for assessment of competencies in blog and wiki [6] as sustainable micro extensions of the functionality of the open source e-learning system Moodle using built-in extension mechanisms;
- approach for the use of e-learning standards and specifications for the development of sustainable micro-extensions of the functionality of open source e-learning systems - development of simulations and educational games [5, 10, 11, 16, 23];
- approaches and models for micro-extensions by adapting an existing technological tool or resource of the e-learning system by changing the semantics and / or usage [23].

In the theoretical-applied aspect the implementation of the proposed models and approaches is made, which proves their viability and efficiency. [1, 2, 3, 4, 5, 6, 16, 23].

2. Framework for description and evaluation of functionalities of e-learning environments. Comparative analyzes.

Frameworks have been developed to explore various aspects of the functionality of open source e-learning systems. Based on them, comparative analyzes of some of the most common open source e-learning systems have been made.

The created frameworks and analyzes are for:

- competence assessment [6];
- possibilities for integration of game elements and educational games in open source e-learning systems [10, 11];
- characteristics of e-learning tools [23].

3. Educational computer games and gamification

One of the modern trends in the development of e-learning is aimed at the use and integration of educational computer games and game elements. The following results have been achieved in this direction:

- prototypes of educational games are created, reflected in [11, 16, 21, 23];
- a model for generating test tasks using game elements has been created [17, 18];
- technology for self-preparation and self-assessment of students using gamification has been developed [20, 23].

4. Mobile learning - analysis, modeling and implementation in countries in conditions of military conflict.

Based on an in-depth study of all stakeholders in the e-learning ecosystem at some of the universities in the Republic of Yemen, the following results have been achieved [8, 9]:

- the technological challenges for mobile learning in relation to the unstable communication environment in the conditions of military conflict have been identified;
- the risks of using different learning materials provided electronically in relation to the end devices used have been assessed;
- the cultural peculiarities of the environment for conducting the training are assessed.

The FRAME model for mobile learning has been expanded and adapted and a technological model for the implementation of mobile learning with pilot research in the Republic of Yemen has been developed. The technological model is applicable in developing countries with a poorly developed ecosystem for e-learning and problems in the communication infrastructure. [13]

5. Study of stakeholders in the e-learning ecosystem

Questionnaires have been created, tested and validated to study various aspects of the interaction of stakeholders in the e-learning ecosystem, both with the technological means in it and with other stakeholders. The contributions here are in the direction of:

- identification of the necessary new functionalities of the technological means of the e-learning ecosystem and in particular of the e-learning systems, which at least for now are the core of this ecosystem [3, 7];
- identification of the end user devices used by the learners and determination of the specifics of the learning materials used through them [8, 9];
- identification of game elements and mechanics preferred by learners and trainers [12, 14, 16, 19].

6. Development of e-learning

An analysis and systematization of the state, problems, trends and opportunities for the development of e-learning in general and in particular - in Bulgaria and in the Republic of Yemen, both in terms of technology and in terms of policies for the management of e-learning and distance learning processes, have been made [13, 22, 23]. The evolution of Web technologies and their impact on e-learning has been traced [23].

The monograph of Assoc. Prof. Tuparov "**E-learning. Development and sustainability of open source e-learning systems**", ed. **Education and Knowledge, Sofia, 2021, ISBN 978-619-7515-26** considers in detail the various opportunities for sustainable development of open source e-learning systems. The basic concepts and definitions for e-learning and mobile learning are systematized. Educational computer games and game visualization are considered in the context of e-learning. Systematization has been made and a framework for comparison of the means for development, provision of services, activities and resources for e-learning has been developed. A general model of the overall ecosystem of e-learning is presented. A critical analysis of e-learning standards and specifications and the possibilities for their use to expand the functionality of open source e-learning systems has been made. The proposed several main approaches for the development of sustainable micro-extensions of these systems solve various specific needs of the educational process in the electronic environment. The presented examples and models for sustainable expansion of the functional capabilities of open source e-learning systems have been developed under the guidance of the author, and some of them have been implemented by his graduates.

Assoc. Prof. Tuparov is the author of a chapter from the book **Tuparova D., G. Tuparov, R. Doneva, N. Staevski, e-Learning in Bulgaria, Book E-Learning Practices, (Ed. Ugur Demiray), Volume 1, pp. 77-106, Anadolu University, Turkey, ISBN 978-975-98590-8-4**, and in the chapter "e-Learning in Bulgaria" the trends in the development and application of technologies in different levels of the education system and business, state policies for information technology development are analyzed. Specific examples of e-based courses and e-learning systems developed by the authors of the article are presented.

According to the reference submitted by the applicant, 107 citations were noticed in Scopus and Clarivate Analytics Web of Science, which were not used in previous procedures for PhD or Associated Professor promotion. Citations are made both to publications listed in databases recognized in national scientometric indicators and to publications that are not indexed in them, but are cited in publications indexed in Scopus and the Clarivate Analytics Web of Science. Some citations are also indexed in the IEEE Xplore Digital Library, but are not listed when the same citations are indexed in Scopus / WoS.

Assoc. Prof. Dr. Georgi Teoharov Tuparov has participated in 13 international, national, regional and university projects, and he is the leader of one national project and is the leader of the Bulgarian team in one international project.

He participates as a co-author in 12 published textbooks and 17 tutorial textbooks.

He has been a member for more than 10 years of:

- Union of Mathematicians in Bulgaria, and
- IEEE, Computer Society and Educational Society.

According to the information provided, he lectured for one semester at the University College Dublin, Ireland and participated in an Erasmus mobility at the University of Ljubljana, Slovenia.

In summary, I would like to emphasize that the publications present results significant in originality, innovation and number, with a certain scientific and practical contribution. I believe that all submitted scientific papers are in the field of the competition. The publications in renowned editions and in the materials of conferences acquaint the interested researchers with the results obtained by Assoc. Prof. Dr. Georgi Teoharov Tuparov in the professional field "Informatics and Computer Science".

4. ASSESSMENT OF THE CANDIDATE'S PERSONAL CONTRIBUTION

From the documents submitted to me for participation in the competition, I draw a conclusion about the personal merit of the candidate in the contributions presented in the publications. I think that the publications, despite being co-authored, undoubtedly include a significant contribution from the candidate.

5. CRITICAL REMARKS AND RECOMMENDATIONS

From the presented report, I am left with an impression of the candidate's scientific interests and activities with various topics. I have no critical remarks.

6. PERSONAL IMPRESSIONS

I have personally known Assoc. Prof. Dr. Georgi Teoharov Tuparov for 7 years, and I am convinced that he is an excellently prepared and highly competent teacher, responsible and in-depth scientist, successful participant in research projects and a professional with extensive practical experience.

CONCLUSION

The documents and materials submitted by Assoc. Prof. Dr. Georgi Teoharov Tuparov **meet all the requirements** of the Law on the Development of Academic Staff in the Republic of Bulgaria (RASRB), the Regulations for Implementation of the RASRB and the relevant Ordinance of the New Bulgarian University.

The candidate in the competition has presented a **significant number** of scientific papers published after the materials used in the defense of the academic position "Associate Professor". In the works of the candidate there are original scientific and applied contributions, which have received international recognition and a representative part of them are published in journals and scientific collections published by international academic publishers. The theoretical works have practical applicability, as some of them are directly oriented to the educational work. The scientific and teaching qualification of Assoc. Prof. Dr. Georgi Teoharov Tuparov is **unquestionable**.

The results achieved by Assoc. Prof. Dr. Georgi Teoharov Tuparov in the teaching and research activities **fully comply** with the specific requirements adopted in connection with the Ordinance of the NBU on the application of the Law on the Development of Academic Personnel.

After getting acquainted with the materials and scientific papers presented in the competition, analysis of their significance and the scientific, scientific-applied and applied contributions contained in them, I find it reasonable to give my positive assessment and recommend the Scientific Jury to prepare a report-proposal to the Academic NBU Council for election of Assoc. Prof. Dr. Georgi Teoharov Tuparov to the academic position of "Professor" at the New Bulgarian University in the professional field 4.6. Informatics and computer science (Informatics).

21.07.2021

Reviewer:

Prof. Georgi P. Dimitrov, PhD