Summaries

Of Monograph and Scientific Publications

Of Chief Assistant PhD Eng. Valentin Tonev Atanasov,

applied for academic position of "docent", in higher education field: 5. Technical Sciences, Research area 5.3 Communication and computer networks (Automated systems for management and information processing), Department Communication and Computer Systems, Faculty of Technical Sciences, Konstantin Preslavsky University of Shumen

1. **Monograph – Valentin Atanasov, „Interactivity in WEB based learning applications", Konstantin Preslavsky University Press Shurnen, 2020, ISBN 978-619-201-430-8**

Summary: The main thesis of the monographic work brings to the fore the formation of an approach and subsequent methodology for generating an interactivity indicator in Web-based learning applications. The research is based on the synthesized framework, models and workflows, establishing parameters for measuring the interactivity of this class of learning applications and its subsequent assessment.

To meet this requirement, it is necessary to define criteria by which the interactivity of a Web-based learning application can be measured and subsequently assessed - a circumstance dictated by the outdated provisions of the IEEE 1484.12.1-2002 Learning Object Metadata Standard, related to the description of interactivity.

The following are determined as direct outcomes from the stages of research in the monographic work:

- A framework for measuring and assessment of educational interactivity has been synthesized;
- A methodology for measuring and assessment educational interactivity is proposed;
- Criteria for measuring and assessment educational interactivity are defined;
- A taxonomy of interactivity assessment has been synthesized;
- A domain name space and specifications of educational interactivity are defined;
- A classification of interactive objects for measuring and assessment interactivity has been made;
- An algorithm for determining the complex index of educational interactivity has been synthesized;
- A didactic model of a digitally based learning process has been synthesized;
- A model of educational interaction has been synthesized;
- Conceptualization of educational interactivity has been made;
- A classification of educational interactivity has been made.

2. **Atanasov, V., A Conceptual and functional model of the web based learning application, MATTEH 2020 Conference proceedings, Volume 2, pp.82-88, 2020, ISSN 1314-3921**

Summary: This publication presents a possible approach to the system modeling of a Web based learning application. A conceptual model, a functional model and a workflow of a learning application are synthesized. The main roles and functions of the users of the learning application are considered. In terms of the educational context of the application and its integration in a given digitally based learning process, a didactic model of a digitally based learning process has been synthesized. This systematic approach of modeling does not set restrictions, rather it allows adaptations in the presence of specific requirements for the implementation of the digital form of educational process.

3. **Atanasov, V., Ivanova, A., A Framework for Measurement of Interactivity of Digital Learning Resources, 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), Opatija, Croatia, pp. 649-654, 2019, ISSN 2623-8764**

Summary: The Digital Education Action plan, adopted by the European Commission is setting out a strategy to help EU Member States meet the challenges and opportunities of education in the digital age. Action 9, which covers the third priority of the plan is intended to measure the progress in the use of digital technologies in school education. Measuring the progress itself requires establishment of measurable criteria. When we consider digital education, the digital learning content becomes one of the crucial components of the educational process. At the same time the growth of the interactive technologies transforms the digital generation to a generation demanding a highly interactive experience in the classroom. The research presented in this paper identifies a necessity to be established a detailed specification of criteria measuring the interactivity of digital learning content in order to assure a learning process adequate to the learners needs, attitudes and expectations. An abstract concept of learner-content interaction in a digital context is provided and a framework of identifiers, measuring the interactivity of various formats of digital learning content is proposed.

4. **Lambeva, M., Atanasov, V., Fuzzy Modelling Of the Academic Staff Attestation Process, Proceedings of the 12th International Scientific and Practical Conference. Volume II, Rezekne Academy of Technologies, Latvia, vol.II, pp.205-207, 2019, ISSN 1691-5402**

Summary: A large class of real-world problems, arising in the administrative - organizational systems is connected with the attestation of the academic staff in accordance with predefined and linguistically described evaluation criteria. Such problems are solved in the circumstances of uncertainties of different types. The process of interpretation goes together with some ambiguity and inaccuracy due to the subjective interpretation of the criteria by experts. The Fuzzy Set theory provides a convenient apparatus for formalization

and creation of new intelligent decision-making methods, based on analysis and processing of the expert knowledge. This paper offers a method of fuzzy modelling of the problem of scientific and pedagogical staff attestation which gives the possibility of an adequate interpretation of the attestation results. The method can be implemented programmatically and can be incorporated in the systems of education quality management.

5. **Atanasov, V., T., Transposition issues in digital learning process, MATTEH 2020 Conference proceedings, Volume 1, pp.117-124, 2020, ISSN 1314-3921**

Summary: This publication reviews problematic aspects of the digital transposition of a real learning process. Analyzing existing studies, in the context of a pandemic environment, factors are identified that have a negative impact on the application of a partially digitized learning process. The set of the main characteristics of the earning process is determined, forming basic terms for conceptualization and formalization of a model of an entirely digital based learning process.

6. **Atanasov, V., Measurement and assessment of educational interactivity in web based learning applications, Proceedings of International Scientific Conference "Defense Technologies" DefTech 2020, Collection of papers 2020, pp. 245-252, 2020, ISSN 2367-7902**

Summary: There is an outdated and unfunctional norm in the IEEE 1484.12.1-2002 Learning Object Metadata Standard, direct related with the process of the interactivity assessment. In this paper a measurement and assessment approach of educational interactivity is synthesized through already established measurement framework for Web based learning applications. The presented approach is intended and applicable for DOM based document structures. For the assessment completion a complex educational interactivity index is generated, whose informational set is fully accessed via HTML mechanism.

7. **Kalev, K., Atanasov, V., Some aspects in the design and development of learning applications for engineering specialties, Journal of mining and geological sciences, University of Mining and Geology "St. Ivan Rilski", vol.62 number 4, 2019, ISSN 2682-9525**

Summary: The impact of information and communication technologies has permanently reformed many of the traditional training methods. The changes imposed by the Fourth Industrial Revolution, define new standards and approaches for a high-quality training of engineers. These changes require a transition from technologically-supported to technology-based teaching in lecture rooms and laboratories. The selection of engineers to work with sophisticated automated systems and CNC machines requires relevant competencies for a given specialty. The paper presents some aspects of training students of engineering specialties based on information and communication technologies. The new highly-interactive generation has imposed the creation of a new didactic tool for the purposes of the learning process. One possible solution to this problem is the development

of WEB-based teaching application which supports the visual thinking of the new learner generation.

8. **Atanasov, V., Intelligent educational structure model, Annual of Konstantin Preslavsky University of Shumen, Konstantin Preslavsky University Press, vol. IX E, 2019, ISSN 1311-834X**

Summary: This paper extends conceptualization of a multi-component, logically composed educational structure with ability of self-organizing of distributed learning process. A model of intelligent educational structure is presented, based on conceptual model of digital transformed educational process.

9. **Atanasov, V., T., An algorithm and functional model of game based knowledge level test, Collection of papers 2019, Annual collection of papers 2019, National Military University Vasil Levski Press, Volume I, pp.29-36, 2019, ISSN 1312 6148**

Summary: The publication brings out the casus that the existing set of game mechanisms has a stochastic nature on the one hand, and on the other hand is the approach of integrating a didactic model in the development of a game-based learning application with knowledge testing functionality.

A possible approach of a program game mechanism development in a digitally presented process of knowledge testing is proposed. The derived key difference between the game-based learning process and the traditional learning process presupposes the presence of the phases considered in the study in the proposed algorithm in order to achieve efficiency, reliability and objectivity in assessing students by using this game approach to knowledge testing.

10. **Mazadzhiev, G., N., Evlogiev, S., S., Atanasov, V., T., Conceptual model of smart home mobile technological system, Proceedings of International Scientific Conference "Defense Technologies" DefTech 2019, Collection of papers 2019, pp. 360-366, 2019, ISSN 2367-7902**

Summary: This paper consider synthesizing of conceptual model as a part of development process of smart home mobile technological system, intended for practical teaching of the military cadets and students. The second aspect involves research activity and studies in the field of new ICT approaches in education. Main results are processes optimization and system deploying in condition of restrictions.

11. **Atanasov, V., T., Smart educational cluster conceptualization, Proceedings of International Scientific Conference "Defense Technologies 2018", Collection of papers 2018, pp. 173-181, 2018, ISSN 2367-7902**

Summary: This paper examines the conceptualization of a multi-component, logically composed structure that provides the ability for self-organizing of distributed learning process based on information and communication technologies. The theoretical basis for the

conceptual model is the synthetized paradigm of the educational process and the integration of intelligent agent, realized by final technological solutions.

12. Atanasov, V., Ivanova, A., Student modelling in a web-based platform for learning games composing, Trakia Journal of Sciences, No 4, pp 285-291, 2017 , ISSN 1313-7069

Summary: Purpose: The main goal of this research is to introduce an approach of student modeling in a WEB based platform for learning games composing. Methods: As a theoretical background of the proposed model is used a didactical model of learning game, developed by the authors. The student model is evolved as a composition of sets, formally

representing all the elements of the process of acquiring knowledge using a learning game Results: The general concept and a schematic notation of the proposed student model is presented and a detailed description is also given. The model consists of three areas reflecting activities, individualities and knowledge of the students: Interaction area, Archetype area and Competence area. The model's context is formed by a stimulus environment, for as much as it represents a student who is motivated to learn while playing a game.

Conclusions: The proposed student model is intended to serve not only a standalone learning game but also a WEB-based platform for learning games composing.

13. Smrikarov., A., Beloev, H, Ivanova, A., Atanasov, V., Stoykova, V. et all., Handbook of Innovative Educational Technologies, Third Issue, University of Ruse Press, pp. 75-77, 2018, ISBN 978-954-712-736-4 pages 148

Summary: The main idea exposed in the manual is based on the experience of the University of Ruse in the field of educational innovations more especially in this field of application, whose main goal is to increase the motivation of the students to perceive knowledge and generate new ones. This approach finds normative expression in programs such as "Development of electronic forms of distance learning in the higher education system", "System for qualification and career development of teachers in higher education", as well as in some measures of the National Reform Program (2011- 2015) of the Republic of Bulgaria, developed in implementation of the Europe`2020 strategy. There is a lasting trend at all levels in the educational system for the need for its complex adaptation to the mental model of students. The manual examines and systematizes both traditional approaches applied in the learning process and innovative solutions, views and techniques that meet the modern understanding of the way of perception in students.

Examples of gamification in a real learning process in certain engineering disciplines (Computer organization) are also presented.

14. Atanasov, V., T., Nikolov, L., G., xCPU simulator as a learning app, MATTEH 2020 Conference proceedings, Volume 2, pp.82-88, 2020, ISSN 1314-3921

Summary: This publication represents an implementation of a Web-based application with integration of a student model for the purposes of a digitally based learning process. Approaches for

synthesis of component models, intended for simulations of the processor work, based on CISC architecture, are presented. The presented approach for instruction encoding allows a wide range of code segments that would contribute to a better understanding of the operation of the processor unit by the students. The implementation of the application follows the perceptions of the so-called highlyinteractive generation, which circumstance would lead to higher efficiency of the learning process.

15. **Atanasov, V., T., Milev, A., P., Prerequisites for technology implementation in the field of cybersecurity, MATTEH 2020 Conference proceedings, Volume 2, pp.125-129, 2020, ISSN 1314-3921**

Summary: This publication examines aspects related to the current issues in the field of cybersecurity and the questions raised about the need for implementation cybersecurity technologies in a human activity or the transformation of implemented technologies for this purpose. A formalized apparatus for studying the probability of an event in the domain of "cybersecurity" is presented and a paradigm of cybersecurity is synthesized, which logically constructs the concept of cybersecurity. The presented thesis could give an answer or at least guidelines for answering the main question - Is it necessary to implement such technologies in our business?

16. **Nikolov, L., G., Atanasov, V., T., Techniques for password cracking in wireless Networks, MATTEH 2020 Conference proceedings, Volume 2, pp.125-129, 2020, ISSN 1314-3921**

Summary: Almost all wireless networks are vulnerable to access violation by password guessing or hashed secret key correlation. By choosing some of the famous techniques for password cracking, the possibility for network access will be tested. Some of the most popular software instruments for wireless vulnerabilities estimation are shown in this research paper. Examples of cracked passwords are shown.

Date: 04.01.2021

Drafted: .....

/Chief Assistant PhD Eng. Valentin Atanasov/