

REVIEW

by **Prof. Dr. Yuri Todorov Todorov**, Department of Archival Science and methodology of teaching history ", Faculty of History Sofia University "St. Kliment Ohridski",

member of the scientific jury for the competition for the academic position of associate professor in the professional field **1.3 Pedagogy of education in... (Pedagogy of education in information technologies in the primary grades)**, announced in SN no. 96 on 19.11.2021,

with the only candidate **Ch. Assistant Dr. Ivan Nikolaev Dushkov**, Department of Primary Pedagogy at the Faculty of Science in Education and Arts of Sofia University "St. Kliment Ohridski"

The procedure for holding the academic position of "Associate Professor" in the Department of Primary Pedagogy at the Faculty of Science in Education and Arts of Sofia University "St. Kliment Ohridski" in professional field 1.3 Pedagogy of education in... (Pedagogy of information technology education in primary school), competition announced in SG no. 96 on 19.11.2021 has been observed in all its stages and is lawful. The documentation is prepared completely and accurately and is available in electronic format.

I am preparing this review in accordance with an order of the Rector of Sofia University "St. Kl. Ohridski" RD 38-4 / 04.1.2022 and decision of the scientific jury from a meeting on 27.1.2022

One candidate participates in the competition, Ch. Assistant Dr. Ivan Dushkov, Lecturer in the Department of Primary School Pedagogy at FSEA. He was born on May 12, 1980. His educational qualification is in the field of mathematics and information technology, he graduated with a bachelor's and master's degree from the Faculty of Mathematics and Informatics at Sofia University, acquired pedagogical qualifications in mathematics and informatics. In 2015 he

defended his doctoral dissertation on 1.3. Pedagogy of teaching... on the topic "Integration of information and communication technologies in the teaching of mathematics in primary school (in geometric content)".

The candidate started his career as a full-time teacher of mathematics and informatics at the 8-th secondary school "Vasil Levski", and in 2008 he entered as an assistant at the Faculty of Primary and Preschool Education. He has completed a number of qualification courses and participated in projects that emphasize the synthesis between pedagogy, mathematics and information technology in his profile as a university lecturer. Dr. Dushkov's teaching work is entirely in the field of this competition with disciplines as Information and Communication Technologies in Teaching and Working in the Digital Environment, Audiovisual and Information Technologies in Teaching, Data Processing and Analysis in pedagogical research. The candidate's research and applied project activities are rich, at national and international level with active participation in scientific forums and conferences, a number of projects to improve the skills of pedagogical specialists in the field of e-learning and the use of information technology of the Ministry of Education. and the National Research Fund.

The candidate presents a list of a total of 24 publications, of which in the profile of the competition - 21. Including - two independent monographs, one study co-authored, four articles in scientific journals (three of which co-authored), 17 articles in conference proceedings, seven of them in co-authorship). In addition, Dr. Dushkov participated as a co-author in the development of a textbook for third grade in Computer Modeling and a textbook and notebook for fourth grade in the same subject, as well as two textbooks (teacher's book) in Computer Modeling for third and fourth grade.

Ivan Dushkov's publications can be divided into two main cores - one about information technology and multimedia in education, and the other - for digital modeling of dynamic systems. The monographs presented by the author, in my opinion, are basic for the current habilitation and correspond directly to his teaching profile. I would therefore focus first on their content. The current monograph of Ivan Dushkov, "Multimedia presentations - mistakes, omissions

and guidelines for overcoming them in future primary school teachers", Sofia, Veda Slovena, 2021, has a volume of 123 printed pages. It consists of three chapters, introduction and conclusion, bibliography of 36 titles. The author sets himself the task of analyzing frequent mistakes in the preparation of presentations by students in their preparation for working with information technology in education. The research is based on rich empirical material, which the author collects in his many years of teaching practice. With the methods of mathematical statistics and on the basis of preliminary content analysis on more than 1500 real presentations in the exposition of the monograph a systematization of the defects in the construction of the multimedia presentations is made. Seven main criteria are used, which are of fundamental importance for the pedagogical suitability of a study presentation. The author emphasizes the importance of the successful construction of the presentation slider in favor of high teaching efficiency. In the second chapter of the monograph a set of methods for overcoming defects in multimedia constructions is developed. For me, the biggest defect in this direction is the confectioning of presentation materials on various topics from the curricula of the subjects in the primary school stage and their helpful offering in innovative networks. Users of presentation software often have the attitude that the presentation is an easy job and happens by itself. Overcoming the set of mistakes that the author has systematized will help improve the quality of school multimedia. Critical analysis of the content and development of aesthetic taste when working with presentations will give impetus to the teaching of information and communication technologies in education as a discipline of the course for professional qualification of future teachers. Working with multimedia in the classroom leaves a lasting impression on the formation of knowledge and skills in the student and has educational messages.

Dushkov also draws attention to the negative effects that remain from overexposure of digital methods at school and especially in the initial stage of education. The main defect in this regard is the lack of adequate goal setting and diversity in the work with nonlinear materials with high dynamics and change of images. In conclusion, the opinion is that the monograph proposed by Dr.

Dushkov is an original, useful and highly contributing study that clarifies the problems in training future teachers to work in a digital environment. The high scientific style of the exhibition and the competent handling of the methods of statistical empiricism are impressive, on the basis of which the conclusions made by the author are possible as indisputable evidence. The author reflects the applied criterion system for information competence and literacy both for the traditional methods of learning and training and for the innovative learning through digital technologies. A novelty from a methodological point of view is the systematization of problems that arise in the creation of multimedia didactic materials. The benefits and disadvantages of integrating information technology in the field of secondary education, in particular primary school education, should also be highlighted. Of particular importance in the didactic aspect are the criteria developed by Dushkov for comparative analysis of educational content in pre-meta computer modeling for primary school.

The other monograph of Dr. Dushkov, placed in the list under number one, is entitled "Integration of information and communication technologies in the teaching of geometry in primary school", Sofia, Veda Slovena, 2021, with a presentation of 167 pages in the usual three chapters, with introduction and conclusion and bibliography with 182 titles. Here the aim of the author is to analyze the possibilities of information technology, in particular computer multimedia, in the study of geometric content in mathematics education for the initial stage of high school. He achieved this through a pedagogical experiment in two groups of probands through a proven diagnostic tool for assessing knowledge and skills in mathematics. The study involved 161 randomly selected students from first to fourth grade, divided into experimental and control groups.

After initial acquaintance with the theoretical knowledge in the course of mathematics in primary school, Dr. Dushkov makes an analysis of the pedagogical possibilities of multimedia for the purposes of teaching this subject, proposing the use of educational multimedia presentations. The methodology of the conducted empirical research in terms of purpose, tasks, and scientific hypothe-

sis, as well as the methods and organization of the research are presented in detail. Central is the description of the presentations for geometry training developed by the author. The analysis of the results of the study is based on criteria for assessing the knowledge of geometric content at the entry and exit level for different classes and ages. The statistical survey represents the mean and standard deviation of the experimental and control groups. The study provides an answer to the question about the didactic capabilities of educational presentations in mathematics education, proving the positive effect in mastering the standards set in the curriculum, according to the current Law on Preschool and School Education. Thus, the author proposes a proven model for the analysis of results in mathematics education in the initial stage of high school, which may have a common application.

The group under consideration also includes the publications of Dr. Dushkov with numbers 3.7 and 8, as well as from 13 to 21. Thematically, they further develop and supplement the issues discussed above and outline the appearance of the candidate as a researcher and lecturer with professional orientation to the problems of teaching mathematical knowledge in primary school with the help of information technology and the development of educational multimedia materials for this purpose.

In the other thematic circle of the candidate's scientific production there are articles in the field of time-delayed processes in populations (publications from the list with the numbers 4, 5, 6, 9, 10, 11 and 12). Events in national and international conferences on topics related to time delay mathematical models have been noted. Dushkov's participation in author teams in the field of time-delay process analysis demonstrates his competencies at the system-theoretical level. The mathematical apparatus for their study requires the construction of information models with nonlinear temporal dynamics and continuous change of properties. The author applies differential equations with time delay in the population dynamics, which contribute to the improvement of the theory of differential equations with deviation of the arguments. Publications in this thematic

field unequivocally prove the candidate's mathematical competence and demonstrate his research interests in the field of applied mathematics.

The evaluation of the candidate according to the minimum national requirements and the obligatory criteria of Sofia University "St. Kliment Ohridski" can be made with the attached reference in accordance with Art. 2b of the ZRASRB for the scientific field of Pedagogical Sciences, 1.3. Pedagogy of teaching in... (Pedagogy of teaching in information technology in primary school). Ivan Dushkov has a defense dissertation and monograph - main habilitation thesis on "Multimedia presentations - mistakes, omissions and guidelines for overcoming them in future primary school teachers", which meets the minimum national requirements in groups A and B (150 points). Both are in the field of competition, with which the candidate meets the basic requirements of Sofia University "St. Kliment Ohridski". According to group D, the candidate has presented another monograph, outside the main habilitation thesis, has two publications with reference in world databases with scientific information, one co-authored study and 12 articles and reports with scientific review or editing. The indicators for group D gain a total of 223.75 points. The presented list of noticed citations for Ivan Dushkov's publications includes 14 citations with the respective bibliographic reference. This does not include auto-citations. This satisfies the minimum national requirements and for the short period of reporting definitely demonstrates the echo that Dr. Dushkov's works find in the national and international methodological and mathematical-applied literature. In conclusion, it can be said that the scientific output of the candidate fully meets the minimum national requirements and the requirements of Sofia University "St. Kliment Ohridski".

In terms of main content, the scientific production of Dr. Dushkov is in strict accordance with the theme of the announced competition. His scientific work is characterized by competence and originality. The scientific interests of the candidate correspond entirely to the topics of the university courses he teaches, are relevant, as well as scientific and applied significance.

In conclusion, I can identify the following main contributions derived from the scientific production of Ivan Dushkov:

1. A study, approbation and approval of a tool for evaluating methods in mathematics education at the initial stage of secondary school has been made. Based on this, an innovative approach to the integration of educational multimedia is applied in practice.

2. The problems that prevail in the construction of multimedia didactic materials for the purposes of training are systematized, an analysis is made and the measures for overcoming the shortcomings are indicated.

3. An author's set of educational multimedia presentations has been developed and tested, which are included in the teaching of mathematics in the primary grades using entertaining tasks.

4. The candidate develops a system of criteria for comparative analysis of educational content related to the subject Computer Modeling in primary school.

5. Studies of time-delayed processes in populations have been made.

6. As a result of the scientific research, electronic courses for training of students from pedagogical specialties have been developed, which connects the research in the field of scientific work of the candidate with his academic teaching.

All this gives me reason with full conviction in the scientific and pedagogical merits of Ivan Nikolaev Dushkov to support his candidacy in the current competition for the academic position of "Associate Professor" in Pedagogy of Information Technology Education in primary school in the Department of Primary Pedagogy at the Faculty of Science in Education and Arts at Sofia University "St. Kliment Ohridski".

Sofia, February 22, 2022

Reviewer:

Prof. Dr. Yuri Todorov Todorov