

## STATEMENT

by Prof. Nikolay Stoyanov Kolishev, D. Sc.

on the theoretical and practical contributions in the publications of Assoc. Prof. Ph.D. Violeta Ivanova Kyurkchiyska, participant in a competition for taking the academic position of "Professor" in the field of higher education 1. 1. Pedagogical sciences, professional field 1.2. Pedagogy of training in... (Methodology of Mathematics Education in Primary Classes), announced in the State Gazette, issue. 82/14.10.2022

### **I. Biographical Info**

Assoc. Prof. Dr. Kalina Alexieva was born on 28.12.1961. In 1986 she graduated in Mathematics from Shumen University "Bishop Konstantin of Preslav", and in 2014 graduated from the Master's program "Pedagogical Rehabilitation of Mental Retardation". In 2018, she defended her doctoral dissertation at Shumen University.

In the period 1986 – 1994, Assoc. Dr. Kalina Alexieva worked as a teacher and technical assistant at the Faculty of Social Sciences of Shumen University. From 1994 to 2006 she worked as a part-time assistant, assistant, expert on student affairs and chief coordinator at the Faculty of Pedagogy at the University of Shumen. In 2020, she won a competition for the academic position of Associate Professor.

### **II. General characteristics of scientific production.**

The applicant has submitted for review a scientific output of 18 publications, including 2 monographs (1 habilitation work and 1 monograph that is not presented as a main habilitation work), 15 articles and reports published in non-referenced peer-reviewed journals or published in edited collective volumes, 1 university textbook.

In the habilitation work of the candidate "Modeling and visualization in creative work in mathematics" innovative options for solving theoretical and practical tasks in elementary school mathematics with the help of didactic modeling are presented. Also presented are valuable ideas for structural and structural-functional modeling of tasks from independent works of students from the EQD of Bachelor and EQD of Master, trained on the subject.

The university textbook "Manual for seminars and practical exercises on the methodology of teaching mathematics in primary school" has been developed at a high professional level in relation to all three mandatory didactic components, namely: basic text, learning apparatus and orientation apparatus.

As common characteristics for all presented publications, we can highlight the following: the actuality of the subject matter; logical structure; precision in the definition and use of basic concepts; competent systematization and analysis of significant literary sources; justification of productive practical ideas; highly professional language and style of exposition.

### **III. Evaluation of scientific and theoretical contributions.**

The scientific and theoretical contributions presented by the candidate are in the field of both the methodology of mathematics education in the primary classes and in the field of didactics of higher education. The presented contributions correspond to the content of the submitted publications and indicate a good level of professional reflection. I would point out the following two contributions as particularly significant:

1. A concept was developed for the application of didactic modeling as a method of teaching mathematics in elementary grades. The concept is included in the curriculum of the university course Methodology of Mathematics Education in Primary School. The relationship between modeling as a method of training and the principles of visualization and accessibility of training is convincingly analyzed.

2. A concept has been developed for the experimental and research work of students in the process of mastering the methodology of mathematics education in the primary school. The concept has been approved in the process of education of students, as a result of which the content of the university course in the elective course has been updated and enriched. Current problems in the teaching of mathematics at the initial stage of education and the Elective preparation in mathematics at the initial stage of education for the EQD of Bachelor and EQD of Master.

#### **IV. Evaluation of the practical and applied contributions.**

The content of the presented publications testifies to the developed ability of theoretical designs to become adequate practical solutions, the realization of which will lead to improvement of the process of training in mathematics in the primary school. As particularly significant, I would point out the following practical-applied contributions:

1. The following systems of exercises aimed at the development of the students' intellect and mathematical abilities have been developed: 1) creative exercises for working on ready-made models of text problems; 2) creative exercises on building models of text problems; 3) variant tasks for composing text problems on: a shortened record, a schematic model, a graphic model, data from a table, a mathematical model, etc. Based on these developments, the content of the university course on Methodology of Mathematics Education in Primary School has been updated, and in particular the section "Creative work on textual problems in mathematics in I – IV grade" for the EQD of Bachelor and EQD of Master.

2. In order to update the university course *in the subject to the elective course at the initial stage of education*, the following systems of variant problems for the application of modeling and visualization have been developed: 1) in the application of the *inversion* method and the properties of the reciprocal arithmetic actions; 2) in solving diophantine equations; 3) in solving problems of the set theory with Euler-Veen diagrams.

3. Comparative content-analyses of the new mathematics textbooks for the I-IV grade of the different collectives and publishing houses have been made with regard to the separate sections of the curriculum, as

a result of which the content of the university course in the discipline *Methodology of Mathematics Education in the Primary School* for EQD of Bachelor and EQD of Master has been updated and enriched.

4. A study was carried out to verify the mathematical competence in the preparatory period of the 1st grade mathematics education. The study was carried out with an original author's toolkit and on the basis of adequate indicators (knowledge of numbers, quantitative representations, knowledge of actions with numbers, measurement, geometric figures and shapes, logical problems).

#### **V. Teaching activity**

I have immediate impressions of the teaching activity of the candidate and I can say that she has developed the ability for logical, in-depth, challenging and informative oral exhibitions, as well as the ability to motivate the trainees and create an interactive educational environment. The textbooks and teaching aids presented by her, support this impression because they are distinguished by competently systematized theoretical and practical information, with resonant accents on the essential and thought-provoking issues. The language and style of the exhibition are understandable and accessible for the specific readership group and with an intriguing way of presenting the curriculum.

#### **VI. Conclusion.**

In conclusion, I can state that **I positively evaluate** the quality of the systematization of theoretical information in the presented publications, the concept of application of didactic modeling in the process of teaching mathematics in elementary grades, the concept of experimental-research work of students, as well as professionally developed systems of exercises for students. The scientific-theoretical and practical-applied contributions in the candidate's publications are at a level that fully meets the legal requirements for occupying the academic position of "professor" in professional direction 1.3. Pedagogy of training in... (Methodology of teaching mathematics in elementary classes).

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