REVIEW

by competition for the academic position of "docent" in

professional direction 1.3. Pedagogy of training in ...,
scientific specialty "Teaching methodology in mathematics and informatics",

announced in SG no. 38/28/04/2023

with candidate Dr. Elena Koleva Kovacheva

Reviewer: Prof. Ph.D. MARGARITA GEORGIEVA CHRISTOVA - PLASHILSKA

1. General and biographical data

The candidate for the position of associate professor, Dr. Elena Koleva Kovacheva, was born on January 20, 1974. In 1997, after a five-year course of studies at the Plovdiv University "Paisiy Hilendarski", she was graduated of master's degree in informatics with a second professional qualification "teacher of informatics and mathematicя".

Elena Koleva Kovacheva has over 25 years of work experience in the field of teaching mathematics and informatics. Her career growth began with the position of "teacher of mathematics and informatics" in a secondary school, in a college and in a center for adult learners. From 2000 to 2018, she was a teacher of informatics and information technologies in the Department for teachers' qualification of "Episcop Konstantin Preslavski" University of Shumen- DIKPO in Varna. There she held the positions of "assistant", "senior assistant" and "chief assistant". Since 2018, she has been a part-time teacher at the Technical University of Varna.

The candidate participates in a number of internal, national and international scientific projects and programs, among which: Project Erasmus + KA220-VET - Cooperation partnerships in vocational education and training, "The Classes on The Moon" (participant in a team as a partner on the part of SMB - Varna); Project of SMB - Varna "Mathematics in Electronic environment with Geogebra Activity (Mathematics in Electronic environment with Geogebra Activity - MЄGA)", "America for Bulgaria" Foundation; National Program "Qualification", MES for 2019, 2020, 2021; Project BG05M2OP001-2.010-0001 Qualification for professional development of pedagogical specialists", MES 2018, 2019, 2020, 2021; Project BG05M2OP001-2.011-0001 "Support for success" - phase 1 and 2; 2018 - International European project under the Erasmus program +" 2014 - 2017 on the topic of "Schools: Future Labs" - VG-SPS-BY-14/001559-3); Project of DIKPO No. RD - 08-84/ 04.02. 2016 on the topic: "Cloud technologies in the work of the teacher" (head) and others.

The organizing activity of the candidate includes:

- conferences of Union of Mathematicians in Bulgaria in Varna, TU - Varna. Since 2016, she has been the organizer of the annual scientific and practical conference "Mathematics and Informatics - Reality and Perspectives", UMB - Varna, and in 2018 she is the organizer of the annual pedagogical conference "Clusters and Innovations in Education", Technical University - Varna;

- various municipal and university forums, such as the First Educational Online Forum of the Municipality of Varna "Digitalization and Innovations in Education and Science", 08 - 10.06.2021 (moderator and speaker), the Second International Educational Forum of the Municipality of Varna "The Quality of Education in the Conditions of Digital Transformation and the Specificity of Generations", (moderator and speaker), etc.

Elena Koleva Kovacheva is an authoritative specialist demanded by the Ministry of Education and Culture for participation in national working groups that analyzed and made proposals for changing the educational content in Information technology and computer modeling (e.g. the commissions named by order of the Minister of Ministry of Education and Culture: RD 09-150/10.07.2020; RD 09-3016/17.12.2019). She is also a reviewer of the specialized edition of TU - Varna" Clusters and Innovation in Education", ISBN 978-954-20-0788-3. She is the co-author of a set of textbooks, study aids and collections approved by the Ministry of Education and Culture on Computer modeling for 3rd and 4th grades, Information technology and Computer modeling from 5th to 7th grade and Information technology from 8th to 10th grade for general education.

2. General description of the submitted materials:

E. Koleva phd participated for the competition with the following documents:

- *autobiography*;
- *certificate of fulfillment of the minimum requirements for occupying the academic position "associate professor" (1 monograph*; *a list of 48 publications; list of citations - 14 items);*
- *reference to scientific contributions;*
- *abstracts of scientific works;*
- *other related documents.*

The list of publications contains 2 articles in scientific publications, referenced and indexed in reputable international databases with scientific information (Web of Science); 32 articles and 14 studies published in non-refereed peer-reviewed journals.

Quotes are: two in monographs and 12 in non-refereed peer-reviewed journals.

The provided materials characterize the candidate as an active university scientist in the field of mathematics and informatics teaching pedagogy.

3. General characteristics of the candidate's scientific research and applied scientific activity

Dr. Elena Koleva Kovacheva presents one independent monograph and 48 publications, which proves that she meets the minimum requirements for acquiring the academic position of "associate professor" (see ZRASRB, art. 2b, paras. 2 and 3).

The monograph „*The teacher and computer modeling in school*" presents an author's study of a computer modeling of teacher training model. The topic of the scientific work is consistent with the need for innovative approaches in Computer modeling and information technology education. It offers approaches to increase the digital skills of Bulgarian teachers based on the systemic approach with clearly defined applicability in school settings.

The main theme of presented **articles** relates the content of the lectures and practical classes led by Dr. Elena Koleva. This guarantees sharing of her scientific research with the students and teaching staff she trains. The content of the posts refers to:

- The main characteristics of various software and hardware tools applicable in the learning process. Various aspects of their application have been examined - both as a learning content and a means of learning forms.
- Formation of the digital competence of teachers which offers options for enriching the skills of pedagogical specialists both as teachers and administrators.
- The methodological essence of the training process in Computer modeling and information technology, applying the new tools.

Some of the publications are co-authored, which proves her ability to work in a team.

In her autobiography, Elena Koleva Kovacheva specifies that she is a part of author teams of textbooks and teaching materials in Information technology and computer modeling for students from 3rd to 10th grade. This activity does not fit into the context of the minimum requirements for holding the position of "associate professor", but it clearly illustrates the importance of Elena Koleva Kovacheva as a scientist, whose texts are positively evaluated by the national commissions for approving textbooks and teaching aids.

4. Evaluation of the pedagogical qualification and activity of the candidate

Dr. Elena Koleva has led lectures and practical classes for students and pedagogical specialists in various forms of studies (in courses for bachelor's and master's degrees; in additional professional qualification "Teacher"; in specializations, etc.). Her lecture courses clarify basic problems of teaching methodology in mathematics and informatics such as:

- Methodology of training in informatics;
- Methodology of training in computer modeling;
- School course in computer modeling;
- Visual programming in a block environment;
- Fundamentals of algorithms;
- Innovative approaches in computer modeling training;

- Information and communication technologies in learning and working in a digital environment;
- Project-based approach in learning;
- The student portfolio in education;
- Cloud technologies (master's degree TKMT, cat. TKK, TU - Varna);
- Social pedagogy (Bachelor's degree in SM, cat. SPN, TU - Varna);
- General pedagogy (Bachelor SM, cat. SPN, TU - Varna);
- General and social pedagogy (bachelor SM, cat. SPN, TU - Varna), etc.

The lecture courses of Dr. Elena Koleva, intended for the continuing qualification system, have their own specificity. As a lecturer in short-term training courses under national programs and projects, she develops fundamental methodology topics, as well as those related to the specialization of the associate professor candidate (training in Computer modeling and information technologies). For example:

- Cloud technologies for an effective communication at school;
- Cloud technologies - a means of implementing modern management models of educational institutions;
- The interactive whiteboard as a mean of implementing innovative approaches in education;
- Basic digital competences for implementing innovative approaches in education;
- Application of a tool kit for early identification of students at risk of prematurely skipping school system and for a differentiated approach in determining their needs for providing individual support;
- Methodological guidelines for managing a modern educational process (course for V and IV PCS);
- Problem-oriented training for the formation of key competences;
- The process of information technology education in the 7th and 9th grades;
- Importance of STEAM training for the development of scientific and computational thinking in students;
- Innovative approaches to organizing STEM training;
- Multimedia didactic tools in kindergarten.

5. Basic scientific and scientific-applied contributions

The monograph and publications presented by Dr. Elena Koleva Kovacheva in the competition for the academic position of "associate professor" give reason to summarize the following **contribution** from its activity:

Scientific contributions:

- An overall theoretical concept and rationale for implementing the new subject "Computer Modeling" in the general education school preparation is described. It is contained in the monograph. This is a learning model developed from the issues of the scientific field "Methodology of learning in informatics".

● A detailed and justified model is proposed for teachers training in Computer modeling. It is contained in the monograph.

● Analyzed and adapted to school conditions are the main characteristics of information technology as a tool in the learning process - interactive whiteboard, multi-mouse technologies, cloud technologies, etc. It is contained in the articles and studies.

Scientific and applied contributions:

● A model for teachers training in Computer modeling has been tested. It is contained in the monograph.

● Presented are applicable concepts for forming and improving teachers' digital skills for using interactive whiteboards, cloud technologies, etc. It is contained in the articles and studies.

● Methodological models have been developed for the use of Information technologies in the learning process of various subjects. It is contained in the articles and studies.

● The functions of the Information technologies in the lesson and in the preparation process are substantiated. It is contained in the articles and studies.

The quatas presented by the candidate are 14: 2 in monographs and 12 in non-refereed peer-reviewed journals which proves that pedagogical specialists know and use the works of the candidate in their publications known among specialized audience and supporting the methodological and pedagogical research of teachers.

6. Scientific and practical contribution:

The described training models, presented in the publications of Dr. Elena Koleva Kovacheva, have been tested in practice. They enrich pedagogical science with analyses, conclusions and recommendations for the implementation of innovative teaching models in the components of the didactic system in order to increase its effectiveness. Fundamentally important for school practice are:

● The theoretical justification of the need to implement the new school subject "Computer Modeling".

● The Computer Modeling Model of Teacher Education applicable to both qualification courses and specializations for pedagogic specialists and students preparing to become teachers.

● The classification of various information technologies as a didactic tool in view of their functionality and applicability in the educational process.

● Systematization of the digital skills that teachers must possess for successful pedagogical practice.

The candidate has detailed her quantitative assessment of a total of 512.65 points according to the National requirements for holding the position of "docent" as follows:

dissertation work for awarding the educational and scientific degree "doctor" - 50 points, for habilitation work (monograph) - 100 points, articles and reports published in scientific publications, referenced and indexed in international databases with scientific information - 22.5 points, articles and reports, published in non-refereed journals with scientific review or published in edited collective volumes - 186, 65 items, studies published in non-refereed journals with scientific review or published in edited collective volumes - 73.5 items, cited in monographs - 20 items, cited in non-refereed journals with scientific review - 60 items. This quantitative assessment is much greater than the minimum requirements for holding the academic position of "docent" " of 400 t.

7. Critical notes and recommendations

I recommend the candidate to add one more focus group for her future research – the students in Pedagogics of Informatics and information technology.

8. Personal impressions and opinion of the reviewer:

My personal impressions are that Dr. Elena Koleva Kovacheva is a well known lecturer asked by the teachers audience, an effective consultant and advisor to students, future teachers. The presented materials demonstrate her scientific and teaching potential both for working with students and pedagogical specialists in the scientific field of "Pedagogy of Mathematics and Informatics Education". Her scientific output is fully sufficient to fill the academic post of "associate professor" and meets the requirements of the RASRB, Art. 2b, para. 2 and 3.

CONCLUSION

The provided materials with their scientific contributions prove the rich teaching experience and the high degree of research competences of Dr. Elena Koleva Kovacheva. After becoming acquainted with her publications, as well as as a result of my personal impressions as Rector of "Episkop Konstantin Preslavski" University of Shumen I find it reasonable **to propose Dr. Elena Koleva Kovacheva to the academic position of "associate professor"** in the scientific field 1. Pedagogical sciences, professional direction 1.3. Pedagogy of training in... (Mathematics and Informatics).

Date: 22/07/2023

REVIEWER:
(prof. Ph.)

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