OPINION

on a competition for the academic position of "Associate professor"

Field of higher education 1. Pedagogical Sciences

Professional field 1.3. Pedagogy of Education in ...(Methodology of Education in Chemistry and Environmental Protection)

Candidate: Dr. Hristivelina Kostadinova Zhecheva

Author of the opinion: Prof. Dr. Violeta Ivanova Kyurkchieva, *Konstantin Preslavsky* University of Shumen

(Order No. RD – 341 from 22.10.2024 of the Rector of University "Prof. D-r Assen Zlatarov" – Burgas)

1. Description of the competition procedure

In the announced competition for filling the academic position "Associate professor" by professional field 1.3. Pedagogy of Education in ...(Methodology of Education in Chemistry and Environmental Protection) for the needs of the Department of Chemistry, announced in the State Gazette no. 70/20.08.2024, one candidate participated: Dr. Hristivelina Kostadinova Zhecheva.

The documents of Dr. Hristivelina Kostadinova Zhecheva submitted for participation in the competition show that the procedure for its disclosure and announcement has been followed and they are in compliance with the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria and the Regulations for its implementation, as well as with the Regulations on the Conditions and Procedure for the Acquisition of Scientific Degrees for Academic Positions at University "Prof. D-r Assen Zlatarov" – Burgas.

2. Scientific indicators

According to the Regulations on the conditions and procedure for acquiring scientific degrees and for occupying academic positions in University "Prof. D-r Assen Zlatarov", Burgas the scientific indicators of the candidate Dr. Hristivelina Kostadinova Zhecheva for occupying the academic position "Associate professor" are the following:

The indicator from group A - 50 (fulfilled)

The indicator from group B is not required for this position

The indicator from group C - monograph, presented as a habilitation thesis 100 points (fulfilled)

Total number of points under indicator D: 401.6 with a required 400 p.

Total number of points under indicator E: 100 with a required 100 p.

Total number of points under indicator F: 55 with a required 50 p.

The presented scientific production of Dr. Hristivelina Kostadinova Zhecheva corresponds to the scientometrics set out in the Regulations on the conditions and procedure for acquiring scientific degrees and occupying academic positions in University "Prof. D-r Assen Zlatarov", Burgas.

3. Main areas of the candidate's research work and most important scientific contributions

The scientific works are in the field of chemistry education and environmental protection, which corresponds to the announced competition (State Gazette no. 70/20.08.2024).
The topic of the research is related to the design of chemistry education, the methodological aspects of the competency-oriented experimental activity in chemistry, the health and environmental aspects and the possibilities of the chemical experiment in a real and digital environment for the formation of key competencies in students and for the development of design competencies for the design of chemistry education by students - future chemistry teachers in the conditions of practical training. The monograph, textbook and publications are dedicated to this topic. Part of the research was conducted within the framework of projects.

The candidate presents 5 textbooks published in the period 2022-2024. All of them support the work of teachers in the field of chemical experiments in chemistry and environmental protection. Three of them provide work in the Organic Chemistry module, and the fourth (under No. 7 in the documents) examines the problems of the educational chemical experiment in the context of health and environmental problems.

In the competition Dr. Hristivelina Kostadinova Zhecheva participates with the ***textbook "Methodology of the Chemical Experiment in Chemistry and Environmental Protection"*** module general and inorganic chemistry University "Prof. D-r Assen Zlatarov", Burgas. Print Bozhich Publishing House.

The book provides training for students in the academic disciplines "Methodology of Chemical Experiments", "Methodology of Teaching Chemistry", "Methodology of Teaching Man and Nature", "Observation", "Current Pedagogical Practice", "Internship Practice". The presented issues are also of service to doctoral students, postgraduates who are trained in forms of continuing education, as well as to teachers of chemistry and environmental protection who are improving their professional qualifications.

The textbook has a total volume of 206 pages and is structured according to the requirements for this type of text. In the first chapter, the author presents the essence of the educational experiment in the context of its role in supporting the process of transition from the sensory to the logical level of knowledge. The experiment, implementing the didactic principle of clarity, contributes to the effectiveness of learning the educational content. Methodological requirements for conducting a demonstration and laboratory chemical experiment are presented. In the same chapter, the main obligations of trainee teachers in ensuring safe conditions for experimentation both in the conditions of the university and at school are presented (paragraph 1.2 Health and environmental aspects of the educational experiment). The author emphasizes the skills of trainees in "selection of reagents, equipment, resource provision of the laboratory, control and risk management, in accordance with the requirements for "green chemistry" with minimal health and environmental risk (p. 22).

In the second chapter of the textbook, 25 experiments are presented, 7 of which have several variants. They provide training in Man and Nature and Chemistry and Environmental Protection, both in general education and in specialized and sectoral vocational training. The considered experiments are accompanied by theoretical explanations and relevant chemical equations, which are consistent with the curricula and state educational requirements. Each experiment is presented through a description, reagents, laboratory equipment, requirements for ensuring healthy and safe working conditions, duration, methodology and technique of the experiment (preliminary preparation, demonstration), observed signs of progress, theoretical foundations, expansion of the possibilities of the experiment, methodological notes. A good impression is made by the provided electronic resources for an experiment in a digital environment, which is illustrated with an appendix (Appendix 3).

The presented textbook is a successful "... attempt to build on the Bulgarian traditions in educational experimentation from the point of view of current understandings of modeling a motivational environment for teaching in Chemistry and environmental protection (p. 9).

The candidate participated in the competition with a ***monographic work "Design of Education - from general models to specific pedagogical practices in Chemistry".*** The joint work with potential readers is evident even in the introductory notes. Structured in an introduction, three chapters, conclusion, list of literary sources and appendix, the monograph has a volume of 218 pages.

The introduction clearly and precisely motivates the choice of the issue under consideration. A choice dictated by the author's desire to overcome negative trends (low

learning outcomes, lack of interest in natural sciences among students, deficit of key skills, unrealistic self-assessment), as well as the motivation to search for ways to resolve them that are adequate to social reality, which corresponds to the professional skills of teachers.

The first chapter presents the model of education in the Bulgarian school of chemistry, commenting on the most significant Bulgarian monograph on the lesson, created in 1975 (according to the reviewers of the monograph), as well as the most recent one at the time of writing the monograph (Angelacheva, A. 2020). The described experimental work was conducted with students, who were presented with invariant structural models of lessons. A comparative analysis of two lesson options defined by the author as a traditional and problem lesson was made.

Educational design is examined in historical and content terms in the second chapter. Special attention is paid to the models of R. Garne and of M. Merrill. The motive for choosing the model of R. Garne according to the author is that it is an effective framework for the learning process, facilitating the development of strategies and problem solving. The choice of the model of M. Merrill (Pebble-in-the-Pond)for design practices for organizing educational events in chemistry and environmental protection is justified by its problem orientation in combination with the possibility of problematizing the educational content.

The author proposes a framework of educational design - a model, the effectiveness and efficiency of which are determined by the results obtained in its practical application in a specific educational context. In the third chapter, an attempt is made to concretize the presented framework based on two models of educational design (with the application of an educational and problem approach) on the same topic from the educational content in chemistry in the 10th grade. (Oxidation-reduction processes in solutions). A good impression is made by the paragraph in the same chapter, in which the effectiveness of educational design models is assessed and opportunities for their improvement are commented on.

In the *conclusion* of the monographic work, its *contributions* are highlighted, namely: a scientifically based version of an educational design framework is proposed, which is a reference point for specifying models adapted for chemistry education. In a practical and applied aspect, variants of design technological solutions for lessons according to chemistry curricula are developed. Learning systems are designed, and for this purpose a set of practical procedures and requirements for designing instructions, embedded in these models, is justified.

Of the 192 sources used, 28 are in Cyrillic and are presented after those in Latin.

The articles with which Dr. Hristivelina Kostadinova Zhecheva participated in the competition are 45 and were published in the period 2010-2024, and the summaries are 7.

The scientific production of Dr. Hristivelina Kostadinova Zhecheva is of interest to pedagogical specialists. 12 citations were noted according to the reference presented by the candidate.

The academic disciplines that ensure the teaching activity of Dr. Hristivelina Kostadinova Zhecheva, both in the educational qualification degree of bachelor and master, correspond to the direction of the competition.

The candidate participated as a co-author in updating and compiling 46 curricula.

According to the author's reference, prepared on the basis of scientific production, which includes publications, works, participation in scientific conferences, research and educational projects, the theoretical and practical-applied **contributions** of Dr. Hristivelina Kostadinova Zhecheva are grouped into 4 thematic areas:

1. Design of chemistry education

2. Methodological and motivational aspects of competence-oriented experimental activity in chemistry

3. Health and environmental aspects of the educational chemical experiment in real and digital environments

4. Possibilities of the experiment for personal and professional development and preservation of the mental health of the subjects of experimentation.

Critical notes, recommendations, questions

In the conclusion of the textbook "Methodology of the educational experiment in chemistry and environmental protection" it is stated that "most of the experiments were carried out within the framework of a qualification course with the award of qualification credit at the Department for Qualification and Professional Development of Pedagogical Specialists at the University "Prof. D-r Assen Zlatarov", Burgas 09.11.2018 – 17.11.2018 with the participation of 46 chemistry teachers in the Bulgas region. **My question is**: Are the participants in the specified qualification course teacher-mentors?

Conclusion

Based on the materials submitted in the competition, I believe that the candidate Dr. Eng. Hristivelina Kostadinova Zhecheva *meets the criteria* for holding the academic position "Associate Professor", determined by the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its Implementation, as well as the Regulations on

the Terms and Procedure for Acquiring Scientific Degrees and Holding Academic Positions at the University "Prof. D-r Assen Zlatarov", Burgas

I propose to the esteemed members of the Scientific Jury to vote positively and to propose to the Faculty Council of the Faculty of Social Sciences at the University "Prof. D-r Assen Zlatarov", Burgas, *to elect* Dr. Eng. Hristivelina Kostadinova Zhecheva to the academic position "Associate Professor" in the professional field 1.3. Pedagogy of the community in... (Methodology of teaching in chemistry and environmental protection).

Date: 17.12.2024

Shumen

Member of the Scientific Jury

(Prof. Dr. Violeta Kyurkchieva)