OPINION

in the competition for the academic position of "Associate Professor" in professional field 5.2. Electrical Engineering, Electronics and Automation, Scientific Specialty "Elements and Devices of Automation and Computing" ("Application of Additive Technologies in Education"), announced in the State Gazette No. 39 dated May 13, 2025

with candidate: Assist. Prof. Dr. Neda Venelinova Chehlarova

Member of the scientific jury: Acad. Chavdar Roumenin, IR-BAS

Introduction

In the competition for the Associate Professor position, the only candidate, Assist. Prof. Dr. Neda V. Chehlarova, submitted documents within the legal deadline. The presented set of materials is in accordance with the list of required documents for the procedure for awarding the academic position of "Associate Professor", according to the Law for Development of the Scientific Staff in the Republic of Bulgaria and the Internal rules of the Institute of robotics at the Bulgarian Academy of Sciences. The candidate participates in the competition with: monograph entitled "Additive Technologies in Education" in a volume of 184 pages, published in 2025 and 13 other publications. Five of them are published in Scopus and/or Web of Science, of which two are in Q2 and three in Q4; and 8 publications are in other scientific databases. Of the presented publications, 6 are independent, 4 are with two co-authors, 4 publications are with three or more co-authors. Assist. Prof. Dr. Neda V. Chehlarova has participated in national projects and scientific programs, including for the Bulgarian National Scientific Fund. A total of 7 citations in refereed editions in Scopus and/or Web of Science are attached.

Results and contributions of the candidate

The contributions and results are of a scientific-applied nature. Initially, I will briefly review the monographic work of Assist. Prof. Dr. N. Chehlarova, and subsequently the presented publications.

I. In "Additive Technologies in Education", a review of the application of additive technologies in an economic and educational context is given. A snapshot of the

types of materials, principles of working with technical devices, production processes, terms, standards regarding additive technologies on a global scale is given. Pedagogical methods for including 3D printing in the learning process of subjects such as Mathematics, Computer Modeling, Information Technologies, Technology and Entrepreneurship, Fine Arts are examined, in STEM centers as an innovative educational environment, as well as in creating conditions for working with people with visual impairments. The role of additive technologies in the preparation and motivation of students for the new engineering professions of the future is examined. Through interdisciplinary integration, additive technologies can serve for the early introduction of engineering principles in education, combining design, electrical engineering and materials science.

I highly appreciate the chosen approach to presenting and analyzing this complex interdisciplinary material. The contributions and results are clearly and professionally presented, which makes the monograph useful for a wide range of scientists. The included illustrations, graphs and tabulograms are organically connected to the text, complement it and contribute to easy reading.

II. I accept the results and contributions proposed by the candidate in the publications presented in the competition:

1. A terminologically defined review of publications from scientific databases on the technological development and transformation of production processes through additive technologies has been made, depending on the types of materials and principles of work with technical devices serving production processes.

2. Systems of tasks for counting geometric figures (triangles, rectangles, isosceles trapezoids, rectangular trapezoids, prisms), 3D printed materials for them and ready-made work scenarios are presented, supporting the development of mathematical competence and spatial thinking of students. The studies conducted with adults, students and people with visual impairments have confirmed the expectations regarding frequently made errors and how to deal with them. This is the strongest contribution of the candidate with a strong educational impact

3. Scenarios for working with a 3D pen, 3D modeling and printing files of educational resources are presented. An analysis of the tested scenarios with students, teachers and educational experts from several cities in Bulgaria is made. Guidelines are given for organizing similar future activities in secondary school, during events such as scientific forums, stand spaces and extracurricular activities, in inclusive education. Such trainings are

suitable for the formation and development of competencies for the use of additive technologies relevant to the modern STEM environment in school education

4. Ways for creating models from the systems of counting tasks in different software environments, including by creating additional buttons/sliders in the specific software product, are presented. Typical shortcomings in 3D printing of volumetric models using a 3D printer are described. These results of Dr. N. Chehlarova support the state strategy for the development and expansion of engineering education in the country, which is currently extremely unsatisfactory.

Critical Notes and Recommendations

I have no shared publications, financial, or other relationships with the candidate in this competition.

General Conclusion

The scientific papers presented by the candidate meet the minimum requirements of the Law for Development of the Scientific Staff in the Republic of Bulgaria Sciences for "Associate Professor" and the Internal rules of the Institute of robotics at the Bulgarian Academy of Sciences in Professional field 5.2. Electrical Engineering, Electronics and Automation.

Based on the above, I propose to the Esteemed scientific jury that **Assist. Prof. Dr. Neda Venelinova Chehlarova** be appointed to the academic position of "**Associate Professor**" in Professional field 5.2. Electrical Engineering, Electronics, and Automation, Scientific Specialty "Elements and Devices of Automation and Computing" ("Application of Additive Technologies in Education"), for the needs of the IR-BAS.

17.09. 2025
Sofia

Member of scientific jury: Sofia
Chavdar Roumenin