OPINION
on the application for academic position "Associate Professor"
in professional field
1.3. Pedagogy of Teaching in… (Mathematics),
for the needs of Sofia University "St. Kliment Ohridski "(SU),
Faculty of Mathematics and Informatics (FMI),
announced in SG, issue 87/19.10.2021 and on the FMI and SU websites

This opinion is prepared by **Prof. Vasil Borisov Milushev, DSc**, Plovdiv University "Paisii Hilendarski", professional field 1.3. Pedagogy of Teaching… (Mathematics), a member of the scientific jury for the competition in accordance with Order № РД - 38-592/10.12.2021 of the Rector of Sofia University.

Only one application was submitted for the announced position by Chief Assistant Professor Irina Zdravkova Voutova, PhD, FMI, Sofia University.

I. General description of the submitted application documents
I have received all required documents in electronic format.

1. Application data
The submitted documents by the applicant Chief Assistant Professor Irina Zdravkova Voutova, PhD comply with the requirements of the corresponding National Acts (ЗРАСРБ, ППЗРАСРБ) and the Regulations on the Terms and Conditions for Acquiring Scientific Degrees and Occupying Academic Positions at Sofia University "St. Kliment Ohridski "(ПУРПНСЗАДСУ).
The applicant presented 19 documents for the competition, including: 14 scientific papers, published in international scientific journals, indexed in internationally-recognized databases or peer-reviewed scientific journals in Bulgaria; 3 studies (in "Mathematics and Informatics" Journal, referenced and indexed in internationally-recognized databases); 2 monographs (one as a habilitation work). The publications are submitted as 17 other documents as follows: CV; copies of Master Degree Diploma and Doctoral Degree Diploma; a document for an academic position; a certificate of professional experience; documents, proving the fulfillment of the requirements of art. 105, paragraph 1, item 2; a list of all publications and a list of publications, presented for the competition; reference for participation in scientific projects (10 projects all together; Irina Voutova was the leader of one of the projects, a member of the project team of the others; 1 project is an international one); reference for participation with reports in conferences; reference for the implementation of the minimum national requirements for the corresponding professional field and the additional requirements of SU "St. Kliment Ohridski"; citations reference; reference for the original scientific results and achievements; abstracts of the reviewed papers in Bulgarian and English language; copy of the announcement in the State Gazette.
All documents are prepared accurately and provide complete and clear information about the research and teaching activities of the applicant.

2. Applicant Data

Irina Zdravkova Voutova was born on April 3, 1974 in Vratsa. In 1993 she graduated the High School of Natural Sciences and Mathematics in Vratsa and started her education at the Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski ". In 1998 she graduated as a Master in Mathematics and Informatics with excellent results. At the same time (in 1998) she graduated the English Language School in Vratsa. In 2000 she graduated as a Master in Economic Management the Faculty of Economics of Sofia University "St. Kliment Ohridski ". In the same year, 2000, Irina Voutova graduated the Erasmus University, Rotterdam, The Netherlands, Faculty of Economic Sciences, Master in Economics and Management.

From 1998 to 2005 Irina Voutova was a part-time lecturer at the Department of Geometry of FMI, SU. At the same time, from September 2000 to August 2002, she was a teacher in Mathematics at "Miguel de Cervantes" Spanish Language School in Sofia and from September 2002 to August 2005 she was a teacher in Mathematics at "Alphonse de Lamartine" French Language School in Sofia. Since February 2005, I. Voutova has been an Assistant Professor at the Department of Teaching Mathematics and Informatics at the FMI, SU. From August 2009 to August 2010 she was a part-time lecturer in Mathematics in English at the Foreign Students Department of Sofia University. From September 2011 to March 2017 she was a teacher in Mathematics at Doris Tenedi Private School in Sofia.

In 2014 Irina Zdravkova Voutova successfully defended a doctoral thesis, titled "Heuristic and Prognostic Role of Theorems in Mathematics School Course", in the field of 1.3. Pedagogy of Teaching in ... (Mathematics) at FMI, Sofia University. Prof. Ivan Tonov, PhD was her scientific advisor.

Chief Assistant Professor Irina Voutova, PhD was the leader of a scientific research project, titled "Research in the Field of Current Educational Monitoring", Contract № 143/2016. She has visited, as a team member of TEMPUS PROGRAME, University of Joensuu, Finland and University of Belgrade, Republic of Serbia. She has participated more than 10 national and international conferences. She has published a total of 3 monographs, 4 books, 3 studies and 13 articles in scientific journals, 18 articles in conference proceedings and 5 school appliances.

Dr. Irina Voutova has very good communicational and organizational skills, acquired during her teaching, organizing the teaching practice of students at school and having participated in various forums in mathematics education. As well as excellent teamwork skills formed in the activity on national and international projects and seminars at the Department. She has a number of digital skills for processing and using information, speaks English fluently and also very good Russian. From 2018 to 2020 she was an assessor in the Expert Commission in Mathematics for 7th grade at the Center for Education and Science of the Ministry of Education and Science. Since 2020 she has been an assessor in the Expert Commissions in Mathematics for 7th and 10th grades at the Center for Education and Science of the Ministry of Education and Science. Participates in the commissions for the State Practical Exam for Acquisition of Teaching Qualifications in Mathematics. Irina Voutova is a member of the UBM.

3. General information of the applicant's scientific works and achievements

The scientific papers submitted by Irina Voutova do not repeat those of previous procedures for the acquisition of a scientific degree and academic position. The attached references under art. 26, paragraphs 2 and 3 of ЗРАСРБ and art. 105, paragraph 2 of ПУРПНСЗАДСУ show that the applicant complies with and even exceeds the minimum national requirements and respectively the additional requirements of SU "St. Kliment Ohridski" for occupation of the academic position "Associate Professor" in the scientific field of the competition. For example, according to indicator Г, she has 254.53 points with a requirement of 200 points.

The scientific contributions in the publications of Dr. Irina Voutova are original and there is no evidence of suspicion of plagiarism. They are published in prestigious journals and scientific forums, which is a testament to their originality and high scientific level.

4. Information and evaluation of the applicant's teaching activity

Since February 2005, Assistant Professor Irina Voutova has had a full academic workload. She has seminars in: Analytical Geometry, Linear Algebra and Analytical Geometry, Geometry, Didactics of Mathematics, Mathematical Practicum, Teaching Mathematics – School Practice, Current Pedagogical Practice with students from the specialties "Applied Mathematics", "Statistics", "Mathematics and Informatics", "Physics and Mathematics", optional module "Teacher in Mathematics", postgraduate qualification "Teacher in Mathematics", "Teacher in Mathematics and Information Technology" and "Teacher in Informatics and Information Technology". She was one of the professors who developed elective lecture courses "Introduction to Mathematics" and "Syllabus and Curriculum" for the students in "Mathematics and Informatics" Bachelor's Program. And also developed herself a lecture course "Management in Education" for the students in "Technology in Teaching Mathematics and Informatics" Master's Program and a lecture course "Inclusive Education" for postgraduate qualification "Teacher in Mathematics", "Teacher in Mathematics and Information Technology" and "Teacher in Informatics and Information Technology". Irina Voutova was the scientific advisor of a graduate student. I have information that Chief Assistant Professor Irina Voutova, PhD is respected among her students and her colleagues at FMI.

5. Instructive analysis of the applicant's scientific and applied scientific achievements presented in the application documents

Applicant's scientific publications are in the following groups: Indicator B.3.Habilitation work – a monograph (1 item); Indicator Г.4.A monograph, which is not presented as the main habilitation work (1 item); Indicator Г.6.Articles, published in scientific journals, referenced and indexed in internationally-recognized databases of scientific information: [Г.6.1], [Г.6.2], [Г.6.3], [Г.6.4], [Г.6.5] – (5 items); Indicator Г.7.Articles published in unreferred journals with scientific review or in peer-reviewed journals: [Г.7.1], [Г.7.2], [Г.7.3], [Г.7.4], [Г.7.5], [Г. 7.6],

[Г.7.7], [Г.7.8], [Г.7.9] - (9 items); Indicator Г.8.Studies, published in scientific journals, referenced and indexed in internationally-recognized databases of scientific information ("Mathematics and Informatics" Journal): [Г.8.1], [Г.8.2], [Г.8.3] - (3 items).

In general, the presented publications concern the methodology work of teachers in Mathematics, as well as the mathematical and methodological preparation of students – future teachers in Mathematics. The scientific contributions of the publications, submitted for the competition are mainly in the field of theory and practice of mathematics education and in particular, about teaching in Geometry, entertaining mathematics, teaching in Mathematics in primary school and about the history of mathematics. Some of them enrich existing theories (related to the heuristic approach in teaching, such as the cognition methods of analogy and generalization). At the same time, is substantiated the thesis that by means of these methods the theorems can become a "reliable conceptual heuristic source" [B.3., p. 10] for new, previously unknown mathematical knowledge, as well as new hypotheses and theorems. For this purpose, a general heuristic scheme [B.3., pp. 67-68] for formulating new statements has been developed, which has been skillfully tested by vector-algebraic modeling as a heuristic approach for constructing spatial analogues (with three or more dimensions) of known planimetry theorems [B.3], [Г.8.1], [Г.8.2]. For this purpose, new concepts "elementary point configuration" and "diagonal point configuration" were introduced and used [Г.6.1].
Spatial analogues of Cheva's and Menelaus' theorems have been discovered, using affine operations of vectors, a mutual feedback between the common point of the Chevians and the common point of the transferzals has been established, and a formula for the radius-vector of the Cheva point has been proved [Г.4].

Articles [Г.7.2] and [Г.6.1] are devoted to the search for and discovery of new ideas for the realization of Perelman's geometric idea for solving Poisson's entertaining problem (concerning fluid pouring), transferred to a rhomboid or a rectangular network.
A concept for modern university education in mathematics for students - future primary school teachers has been developed. It is implemented in the so-called "academic lesson" [Г.7.1]. An appropriate logical-mathematical classification of the elementary arithmetic problems is made and the structural and mathematical models of specific examples are presented - [Г.6.3]. A successful attempt has been made to clarify the resources of arithmetic and algebraic methods and their application in solving word problems. An effective application of the so-called "mathematical map" is proposed, which plays the role of both a logical model of the problem and a technological model of its solution. A new concept of "arithmetic node" has been introduced and its role for optimal choice of the method for solving specific problems has been clarified - [Г.6.3]. A new approach (MZ-map) for modeling problem situations, related to additive operations with finite sets has been developed and a comparative analysis of this modeling and "Euler-Venn diagrams" in solving problems of additive operations with finite sets and natural numbers, has been made, for the needs of the teaching mathematics in the primary grades and the effectiveness of their combined application is shown - [Г.8.3].
There is a separation protocol for the co-authored monograph.

The applicant has submitted a list of 23 citations, most of the citations are found in monographs, books or articles in refereed and indexed journals.

6. Critical comments and recommendations

I have no critical comments on the works. I recommend to Dr. Irina Voutova to strengthen her work with graduates and doctoral students as scientific advisor in the field 1.3.

7. Personal impressions

I have known Irina Voutova since 2014 in my capacity as a member of the scientific jury, assembled for the defence of her doctoral thesis.

My impressions of her as a lecturer, a scientist and a person are excellent.

8. Conclusion on the application

Having read the materials and scientific works submitted to the competition and based on the analysis of their significance, scientific and scientific-applied contributions, I **confirm** that the scientific achievements of the applicant meet the requirements of ЗРАСРБ and the Regulations on the Terms and Conditions for Acquiring Scientific Degrees and Occupying Academic Position "Associate Professor" in Sofia University "St. Kliment Ohridski" in the scientific and professional field of the competition. In particular, the applicant meets the minimum national requirements in the professional field 1.3. and no plagiarism was found in the scientific papers submitted to the competition.

I give my **positive** assessment of the application.

II. GENERAL CONCLUSION

Based on the above information, I **recommend** the scientific jury to propose to the Council of the Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski", to approve the application of Chief Assistant Professor Irina Zdravkova Voutova, PhD for the academic position of "Associate Professor" in a professional field 1.3. Pedagogy of Teaching in… (Mathematics).

17.01.2022   The opinion was prepared by: ....

                 (Prof. Vasil Milushev, DSc)