R E V I E W

By

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Of Scientific Works Presented
In Relation with Participation in a Contest for Occupying the Academic Position of **"Professor"**
at Plovdiv University "Paisii Hilendarski"
Under Higher Education Area: **1. Pedagogical Sciences,**
Professional Field: **1.3. Pedagogy of Teaching**
(Methodology of Teaching Primary School Mathematics)

Only one candidate has submitted documents for participation in the contest for occupying the academic position of "professor" announced for the needs of the Department of Primary School Pedagogy of the Faculty of Pedagogy in state gazette, issue № 31 of 12.04.2019 and the Web site of Plovdiv University "Paisii Hilendarski": **associate professor Vladimira Stefanova Angelova, PhD** from PU "Paisii Hilendarski".

1. Summary of the candidate's procedure

With order № R 33 – 3697 of 10.07.2019 of the Rector of Plovdiv University 'Paisii Hilendarski'(PU) I have been appointed as a member of the scientific jury in a contest for occupying the academic position of **"professor"** at PU under higher education area: 1. Pedagogical Sciences, professional field: 1.3. Pedagogy of Teaching (Methodology of Teaching Primary School Mathematics) announced for the needs of the Department of Primary School Pedagogy of the Faculty of Pedagogy.

Only **one candidate** has submitted documents for participation in the announced contest: **associate professor Vladimira Stefanova Angelova, PhD** from PU "Paisii Hilendarski".

The set of materials submitted by associate professor Vladimira Stefanova Angelova, PhD in paper and electronic form complies with the Regulations on the Academic Staff Development of PU and includes the following documents:

1. application form to the Rector for admission to the contest;
2. CV in EU format;
3. diplomas for *MSc.* educational-qualification degree;
4. diploma for *PhD* educational and scientific degree;
5. certificate for acquiring the academic position of *"associate professor"*;
6. list of scientific works and their copies;
7. reference on compliance with the minimum national requirements;
8. declaration regarding the enclosed documents' originality and authenticity;
9. annotations of the scientific publications, including self-assessment of the candidate's contributions (in Bulgarian and English);
10. work record certificate;
11. documents regarding educational work;
12. documents regarding scientific-research work;

13. other documents compliant with the requirements of the Faculty of Pedagogy;

14. other documents (references, citation proofs, etc.).

At the first meeting held on 16.07.2019 the scientific jury accepted the documents related to the contest. At that meeting I was elected a reviewer in the contest. After reading and analyzing the materials I found that there are no procedural irregularities.

The set of documents presented by associate professor Vladimira Stefanova Angelova, PhD is accurately prepared and organized in a systematic way which allows an objective and complete assessment of the results achieved by the candidate in the contest for occupying the academic position of "professor".

Associate professor Vladimira Stefanova Angelova, PhD is participating in the contest with 44 scientific papers: 2 monographs, 1 studio research paper, 15 scientific articles – 5 of which are published abroad, 1 resource book for university students, 4 methodological handbooks for teachers, 8 mathematics textbooks for primary school students, of which 4 are in paper and 4 are e-books; 13 mathematics activity books for primary school students – all of them reviewed. All of them are developed and published after acquiring the academic position "associate professor" and after acquiring the PhD educational and scientific degree.

All the scientific works comply with the profile of the contest and meet the requirements and therefore are accepted for reviewing.

2. Brief biographical information about the candidate

In 1992 associate professor Vladimira Stefanova Angelova, PhD graduated from the Faculty of Mathematics and Informatics at PU "Paisii Hilendarski" with Master specialty "Mathematics and Computer Sciences" and obtained the qualification "*a mathematician with specialization in informatics: mathematics and informatics teacher*". After finishing postgraduate courses in 1993 she acquired a specialization *"Methodology of Teaching Mathematics"* and *"Second Qualification Degree"*.

Her professional career started in 1992 as a mathematics and informatics teacher in a municipality center for students' technical and scientific arts in Assenovgrad. Since 1996 she has been working at the Department of Primary School Pedagogy of the Faculty of Pedagogy at PU "Paisii Hilendarski". She was gradually promoted to assistant, senior assistant, assistant professor and associate professor in Methodology of Teaching Primary School Mathematics.

She acquired a PhD educational and scientific degree in 2006 after a successful defense of her dissertation before the Specialized Scientific Committee of Pedagogics of the High Attestation Commission.

Associate professor PhD Vladimira Angelova's main responsibilities are: educational, scientific-research and administrative.

Some of the administrative positions she occupies are:

- member of the *Controlling Council* of the *Information Provision Commission* at PU "Paisii Hilendarski";
- member of the Council by the *Qualification and Professional Development Department of Pedagogical Specialists* (QPDDPS) at PU "Paisii Hilendarski";
- director of the *Centre for Electronic Education*;
- member of the Faculty of Pedagogy Council of PU "Paisii Hilendarski";
- head of the *Department of Primary School Pedagogy* of the Faculty of Pedagogy at PU "Paisii Hilendarski";

- coordinator of the Bachelor degree full-time programmes *"Primary School Pedagogy in a Foreign Language"* and *"Primary school Pedagogy"* at the Faculty of Pedagogy at PU "Paisii Hilendarski";
- coordinator of the Master degree part-time programmes *"Kindergarten and Primary School Pedagogy"* /for specialists/ at the Faculty of Pedagogy at PU "Paisii Hilendarski".

Associate Professor Vladimira Angelova PhD participates not only in faculty and university commissions for preparing documents for accreditation of the university and programme accreditation of specific professional fields but in the organization of scientific forums, symposiums, webinars, etc. as well.

She is a member of the Managing Board of the *"Bulgarian Association of Educational Research"* and the association *"A Network for Education and Constructive Activity*".

The candidate's main scientific interests are in the field of *Methodology of Teaching Mathematics.* Her professional competence and qualification comply with the profile of the announced contest for occupying the academic position of "professor".

3. Summary characteristic of the candidate's activities

Assessment of the candidate's pedagogical and educational activity

Associate professor PhD Vladimira Angelova's pedagogical and educational activity is over 23 year-long. Her educational activity has been mainly in the sphere of mathematics and methodology of teaching primary school mathematics. She has been reading lectures to students in obligatory, elective and facultative courses both in Bachelor and Master degree programmes.

In the context of the new documents that reform higher education, the Faculty of Pedagogy completely changed and updated the **curricula** of the pedagogical specialties. Associate professor Vladimira Angelova PhD has been an active participant in these changes.

Associate professor Vladimira Angelova PhD has developed **educational courses** that are part of almost all the Bachelor and Master degree programmes at the Faculty of Pedagogy at PU "Paisii Hilendarski".

The candidate has designed **educational curricula** for acquiring Third Qualification Degree as well as **short courses** for educational specialists for gaining credits at the QPDDPS at PU "Paisii Hilendarski".

Associate professor PhD Vladimira Angelova's work with the university students is diverse. She has been regularly consulting them on issues related to their theoretical and practical education.

Many Bachelor- and Master-degree students have successfully defended their thesis papers after having been consulted by her.

She is a scientific consultant of one **PhD student** who is researching a topical educational question.

My assessment of associate professor PhD Vladimira Angelova's pedagogical and educational activity is very high. In her educational work she applies the most modern achievements of the information and communication technologies and uses contemporary teaching methods and technical tools.

Assessment of the candidate's scientific-research activity

The scientific production presented by associate professor Vladimira Angelova, PhD relates to the thematic area of the contest. The scientific works deal with current issues from the field of the methodology of teaching mathematics.

The overall scientific production in associate professor PhD Vladimira Angelova's academic career growth consists of 89 works. In this contest for occupying the academic position of "professor' she presented 44 works which do not include the publications presented for acquiring the PhD educational and scientific degree or those presented for acquiring the academic position of "associate professor".

The analysis and assessment of the contributions of the presented production by thematic areas are the following:

1) **Scientific research and papers related to the creation of technologies for mastering word problems in primary school mathematics**

The scientific contributions in this thematic area can be assessed through the presented monograph [1] and the scientific articles [8; 14; 15].

The independently written monograph [1] has a high theoretical and applied value and it is professionally and logically built. The timeliness and importance of the work for the contemporary education are undeniable.

The theoretical foundations of the methodology of mastering word problems are analyzed in-depth. After analyzing their structure the author categorized the word problems in an impressive way.

Original and useful strategies for solving word problems are developed with precision and all of them are based on the methods for solving problems or on research.

A technological variation for teaching word problems in primary school education is developed. This technology includes a rich systematic range of problems, accompanied by a relevant and innovative methodology for teaching and learning.

Problem-based situations are created and they are closely related to the word problems.

2) **Scientific research and papers related to the creation of technologies for understanding basic concepts from sphere of competencies: *Geometric shapes and bodies* and *Measurement* in primary school education**

The theoretical and applied contributions here are determined by the publications [3; 4].

An innovative didactic technology is competently developed focused on teaching *area of a rectangle* and *the units of measurement for area* as well as their application for solving mathematical and practical problems.

An original technology is developed by the author for understanding the notions *geometric shape* and *perimeter of a triangle, a rectangle,* and *a square* as well as their application for solving geometry and practical problems.

3) **Scientific research and papers related to the improvement of the methodology for teaching the algorithms for written and mental calculations with natural numbers and basic properties of the arithmetic operations**

The scientific contributions in this thematic area can be assessed through the analysis of the articles [6; 7; 9; 11; 12; 13].

A unique variation is developed for teaching tabular multiplication and division by students and it is richly illustrated and supported by electronic resources.

Different strategies and techniques are developed for explaining the arithmetic operations addition and subtraction with natural numbers. Original and effective rules for quick calculations are discovered and formulated.

Set theory tools and visual strategies are precisely developed by the author and they are designed for mastering a wide range of mathematical knowledge.

The author developed an original methodology which is designed for teaching the properties of addition and presents different options for their application in mathematics education.

4) Scientific research and papers related to the creation of technologies for mastering the skills necessary for solving non-standard problems in primary school mathematics

The scientific contributions in this thematic area can be assessed through the presented monograph [2] and the scientific articles [10; 16; 17; 18]. In this set of scientific production educational technologies are created that develop students' logical-mathematical thinking and their skills to solve non-standard types of problems.

The monograph presents a whole range of theoretical and applied components related to the *Diophantine equations* and *the systems of Diophantine equation.* Many precisely presented and scientifically grounded methods are provided for solving the *Diophantine equations* and *the systems of Diophantine equation.* A complete technology is developed for mastering the solving of the *Diophantine equations* and *the systems of Diophantine equations* and its integration in those forms of the mathematics education that allow its integration.

The author developed a methodological system of exercises and it is designed to teach students how to solve non-standard problems by using set theory models.

The theoretical basis of the indirect apagogical proof is explored in depth and methodological options for teaching this topic in primary school are presented.

A system of exercises for teaching the theme *Counting possibilities* is created and it develops students' logical-mathematical thinking and enables them to practice knowledge and skills of combinatorial character. A thorough development of the idea is presented and it demonstrates the opportunity to integrate the components of this system in the educational content in primary school mathematics education.

5) Scientific papers related to the use of information and communication technologies in education and the creation of electronic mathematics textbooks for students from 1st to 4th grade

The scientific contributions in this thematic area can be assessed through the analysis of the article [5] and the e-textbooks [25; 27; 29; 31].

The educational platform mozaBook is used for the creation of electronic educational content in mathematics for the second grade. Original electronic resources are created and they are integrated in the educational content and guarantee effective education in a digital environment.

Modern electronic mathematics textbooks are created for primary school students from 1st – 4th grade. Various electronic educational resources are developed that include single- and multiple-choice problems and exercises, chains, tables, games, animations, etc. The animations in the e-textbooks demonstrate the algorithms for written calculations, the perimeters of the geometric shapes – rectangle, square and triangle. A unique grid is developed and it visualizes each separate case of tabular multiplication in an easy and interesting way.

6) Developing and creating mathematics textbooks for students from 1st to 4th grade of primary school: and methodological handbooks for mathematics teachers working in primary schools

The theoretical and applied contributions here are determined by the mathematics textbooks [24; 26; 28; 30] and the methodological handbooks [20; 21; 22; 23].

The primary school mathematics textbooks are written very professionally and guarantee the detailed and systematic coverage of the competencies defined in the mathematics curriculum standards and are compliant with the new normative documents, reforming the Bulgarian education. The educational technology developed in the mathematics textbooks is personalized and aids the formation of mathematical literacy and key competencies. The author created and added some original educational games and sample project-based tasks in the mathematics textbooks that allow team work.

This resource pack for the 1st grade deserves special attention because it took part in the competition for best teaching resource – BELMA (Best European Learning Material) which was held in Frankfurt and won a bronze medal in the 6- to 11- year-olds category. Bulgarian first graders have been taught by it since 2016.

The methodological handbooks created for teachers provide a complete didactic technology which is directed towards mathematics education and which is developed in the context of the 1st – 4th grade mathematics resource packs.

7) Developing and creating resource books for university students and activity books for primary school students

The practical and applied contributions here can be assessed through the presented resource books for university students [19], the mathematics workbooks [32; 33; 37; 38; 41; 42], the mathematics practice books [35; 39; 43] and activity books for the elective classes [34; 36; 40; 44].

The theoretical and methodological points of the main theme of the content of the resource book for university students are precisely developed.

The mathematics workbooks are created professionally and comprise problems for consolidation and application of the planned educational content. These workbooks contain tests for independent work that assess primary school students' mathematical competencies.

The educational technologies in these practice books are personalized and aid the mastering of key competencies and the development of creative thinking.

Activity books are designed for the elective classes and they have the interesting and original title *Mathematics with Matt and Emma.* The activity books are designed in accordance with *the curriculum and instructional resources division on mathematics for the elective classes* developed by associate professor Vladimira Angelova, PhD.

The analysis of the scientific and research work created by associate professor Vladimira Angelova, PhD proves that it is incredibly valuable.

Documentary evidence is provided verifying associate professor PhD Vladimira Angelova's participation in 6 scientific projects of which one is international and in many other national and international forums.

Contributions and citations

The presented summary characteristic and my positive assessment of the quality of the submitted materials by associate professor Vladimira Angelova, PhD for participation in this

contest show that there is indisputable evidence related to the candidate's **serious scientific and applied contribution** in the field of methodology of teaching mathematics.

Undoubtedly the presented scientific production is ***the candidate's personal work***.

The analyses of the submitted materials by associate professor Vladimira Angelova, PhD give me the cause to note that ***there is no sign of plagiarism***.

The importance of the scientific production presented by associate professor Vladimira Angelova, PhD is once again certified by the numerous citations and that means that her production is well known amidst the colleagues from the same scientific field.

The Regulations on the implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria defined the minimum national requirements for the scientific activity of the candidate for acquiring the academic position of "professor".

The next table presents the minimum number of required points by groups of indexes as well as the number of points that the candidate participates with in the contest.

Group of indexes	A	B	C	D	E	F	Total sum of points:
Minimum number of points for "professor"	50	–	100	200	100	100	550
The candidate's number of points	50	–	100	275	210	573	**1208**

The evidence for the compliance with these requirements is presented in reference № 7 of the list of documents.

It becomes clear that associate professor Vladimira Angelova, PhD not only complies with the requirements but exceeds the minimum national requirements for acquiring the academic position of "professor".

4. Assessment of the candidate's personal contribution

My assessment of associate professor PhD Vladimira Angelova's personal contribution to the presented scientific production is very high.

I can positively and with conviction make the conclusion that the formulated contributions and the achieved results are fully her contribution.

Associate professor PhD Vladimira Angelova's overall activity proves that she is a successful university lecturer and an accomplished scientist.

5. Critical remarks and recommendations

I have no critical remarks or recommendations

6. Personal impression

I know associate professor Vladimira Angelova, PhD as a lecturer who follows the contemporary trends in education and creates new ones. As a scientist she adheres to the high scientific standards and her scientific production is a proof for that.

CONCLUSION

The documents and materials presented by associate professor Vladimira Angelova, PhD comply with all the requirements of the *Law on* the *Development of the Academic Staff in the Republic of*

Bulgaria, *the Regulations* on its implementation, and the respective PU Paisii Hilendarski Regulations for occupying the academic position of "professor".

The candidate in the contest has presented a significant number of scientific materials of high quality, published after the materials used for the PhD educational-scientific degree defense and the contest for acquiring the academic position of 'associate professor'. The candidate's work contains original scientific and applied contributions that have been granted national and international recognition. The candidate's theoretical elaborations have practical applicability and part of the work is closely directed to teaching and education. The scientific and lecturer qualification of associate professor Vladimira Angelova, PhD is undeniable.

Associate professor PhD Vladimira Angelova's high results in the educational and research activity fully comply with the requirements for occupying the academic position of "professor".

I will explicitly point out that the candidate in the contest complies with the minimum national requirements for occupying the academic position of "professor' in professional field 1.3. Pedagogy of Teaching. I have no doubts for plagiarism in the submitted scientific work.

After reviewing the materials and scientific works presented for the contest and analyzing their significance and the scientific, scientific-applied and applied contributions they contain I find it justified to give my **positive assessment** and to recommend to the Scientific Jury to prepare a report-proposal to the Faculty of Pedagogy Council to appoint associate professor Vladimira Stefanova Angelova, PhD to the academic position of "professor" at PU Paisii Hilendarski under professional field 1.3. Pedagogy of Teaching (Methodology of Teaching Primary School Mathematics).

29.07. 2019 **Reviewer:……..**

/Prof. Violetka Marinova, PhD/