

## RECENSION

### PhD Thesis Evaluation Report

By **Prof. Elena Grozeva Zheleva, PhD, DSc**

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Appointed as a member of the PhD Thesis Examination Committee by Order No. R-109-22 of 17.01.2023. of the Rector of MU Prof. Dr. Paraskev Stoyanov – Varna, and on the basis of Protocol No. 1/18.01.2023. to prepare a **review** under the procedure for acquiring a **Doctoral degree** with candidate: **Pavlina Penkova Teneva** at the Sliven Branch of MU Varna.

**Regarding:** Awarding a **Doctoral degree** in the field of Higher Education 7. Health Care and Sports, professional direction 7.4. Public Health, scientific specialty Health Care Management.

With topic: **“Practical training of medical laboratory workers for the forming of professional skills and competencies”**

Scientific supervisor: **Associate Professor Emilia Georgieva, PhD**

All the necessary documents provided for in the Development of Academic Staff in the Republic of Bulgaria Act, the Regulations to it and the Regulations for the Development of the Academic Staff of MU-Varna have been submitted.

The PhD thesis of **Pavlina Penkova Teneva proposed for defense** is the result of her many years of dedicated work as a healthcare professional, educator and researcher. In 2000, at the Medical College - Sliven of Trakia University, Stara Zagora, she graduated her higher education in the specialty Medical Laboratory Technician Educational, qualification degree Specialist and was awarded professional qualification Medical Laboratory Technician. She completed her Bachelor's degree in the specialty Social Activities with a professional qualification Social Activities at Veliko Tarnovo University St. St. Cyril and Methodius - Veliko Tarnovo in 2003. And in 2009 – Master's degree at Prof. Dr. Paraskev Stoyanov Medical University, Faculty of Public Health – Varna – with a specialty Health Care Management and professional qualification Health care manager and practical teacher.

From 2001 until 2009 she worked under main employment contract as a medical laboratory assistant in the Central Clinical Laboratory of University Multi-Profile Hospital for Active Treatment - EAD Stara Zagora and under an additional employment contract as a medical laboratory assistant /from 2002 until 2003 in TRANSPORT DIAGNOSTIC AND CONSULTING CENTRE EOOD Stara Zagora and from 2012 - 2014 in *Beroe* Medical Complex - Stara Zagora/. From 2007 until 2009 she was a part-time lecturer at Clinical Practice at the Medical College of Trakia University - Stara Zagora. In the period from 2009 until 2016 **Pavlina Teneva** worked at the Medical College of Trakia University Stara Zagora as a lecturer and head of the Medical Laboratory Technician specialty, and in 2016 – 2019 as a senior lecturer. From January 2020 and until now she continues to work as the Deputy Director of the Medical College at Trakia University Stara Zagora.

**Pavlina Teneva** is an established teacher with high professional competences in the field of clinical laboratory, quality control in laboratory practice, health care, clinical practice and pre-graduate internship in the specialty Medical Laboratory Technician.

The PhD thesis of **Pavlina Penkova Teneva** is dedicated to a significant problem related to the practical training of medical laboratory workers, as well as the forming of professional skills and competencies in them.

The thesis presents the established modern needs and requirements of the clinical laboratory practice for the professional training of medical laboratory technicians to practice the profession. The established toolkit is suitable for the purposeful research conducted to present the knowledge in the field of practical training in a Medical College; the role of the teacher in the process of forming of professional competence in the students of the specialty Medical Laboratory Technician.

The PhD thesis contains 122 pages, it is illustrated with 28 figures, 17 tables and contains 5 appendices. The bibliography contains 158 literary sources, out of which 70 in Cyrillic and 88 in Latin characters, 17 of which are from the Internet.

The thesis is structured in accordance with the requirements and includes: **Introduction**; First Chapter **Theoretical foundations of the research problem** with six paragraphs; Second Chapter **Methodology and organisation of the scientific research** with nine paragraphs; Third Chapter **Own research** with four paragraphs; Conclusion; Findings; Recommendations; Contributions; References and Appendices. The content corresponds to the topic and reflects the results of the research done by **senior lecturer Pavlina Teneva**.

The **Introduction** presents the scientific and applied significance of the researched problem – forming of professional skills and competencies in the practical training of medical laboratory workers. The improvement of the professional qualities and competencies of the students, acquired in a real working environment,



at the bases for clinical practice, is analysed. Emphasis is placed on modern conditions in which medical laboratory assistants are active participants in diagnostic and treatment activities, which motivates them for independence in their work and creative thinking.

In the **First Chapter *Theoretical foundations of the research problem***, the PhD candidate presents the relevance of the researched problem; makes a **theoretical analysis of the concepts of “competencies” and “competence”**. She thoroughly analyses **the general characteristics of the Medical Laboratory Technician specialty**. She focuses on the problem of acquiring theoretical knowledge and practical skills in the field of Clinical Laboratory, Microbiology and Virology, Histology and Parasitology. She examines the Legal Regulations for the acquisition of a specialty in the Republic of Bulgaria. She emphasises the learning process and organisational forms for practical training in a Medical College. When examining the pedagogical environment at the Medical College of Trakia University - Stara Zagora she provides information on the overall organisation and implementation of the educational process. **Pavlina Teneva** also focuses on the role of the teacher in the process of forming professional competence among the students of the Medical Laboratory Technician specialty. She analyses the modern needs and requirements of the clinical-laboratory practice for the professional training of the medical laboratory technicians for the exercise of their profession.

She summarises the requirements of the educational system in the modern training of medical laboratory workers, supplementing the training approaches, correcting established traditions and generally accepted stereotypes. Special attention is paid to the ability of students to professionally and critically evaluate the problems of educational institutions, to find the most appropriate ways to resolve the emerging contradictions of education in our country.

The literary sources used show the awareness of the author on the researched problem.

**Pavlina Teneva** examines the radical changes in clinical laboratory technology, succeeding in showing the driving force of innovative technologies that update laboratory medicine. She defends her own position on the support and effectiveness of knowledge, awareness and building positive change in the functioning of the laboratory and the type of information it provides to clinicians.

In the **Second Chapter *Methodology and organisation of the scientific research***, the purpose, tasks and hypothesis of the research are formulated. It presents the topic and object of the study and the scope of the study. The organisation, stages of the research and applied methods, criteria and indicators are outlined. Documentary method, sociological method, quantitative method /survey method/ and statistical methods have been used. For the statistical presentation of the results, the following were used: **Descriptive methods and evaluation methods** /variation



analysis of quantitative variables; frequency analysis of qualitative variables; graphic images/; **Hypothesis testing methods** /non-parametric methods - chi-square method and Fisher's test; Kolmogorov-Smirnov methods; Shapiro-Wilk/; **Correlation analysis** /parametric coefficient of linear correlation - Pearson; non-parametric coefficient of linear correlation – Spearman/; **Regression analysis** /logistic regression analysis and the used critical level of significance  $\alpha = 0.05/$ .

**The research toolkit** shows that the PhD candidate uses self-developed tools. Three survey cards with closed and open questions have been developed to survey the opinion of students, working medical laboratory workers and experts.

The research was conducted after approval by the Committee on Ethics of Scientific Research at the Medical University-Varna with Decision No. 107/28.10.2021.

**The organisation of the research** includes: preparatory stage and actual study. Informed consent for participation in the study was prepared and each study participant was provided with information describing the purpose of the study, benefits to the study participant and confidentiality of information.

The presented information about the conceptual apparatus used contributes to a more complete and accurate clarification of the concepts: professional competence; educational process in a medical college; educational – practical lesson; clinical practice and the overall concept of the PhD thesis.

In the **Third Chapter *Own research***, the research model is presented, the real state of the problem in practice is revealed, the results obtained from the conducted research are provided. The results of the PhD candidate's own research and discussion stand out. In the survey were included **184 respondents**, divided into three groups - students of the Medical Laboratory Technician specialty, working medical laboratory technicians and users of health professionals' services.

An in-depth analysis of the views of the participants in the conducted research was made. It has been proven that competitiveness in education occupies an important place and acquires special importance in the modern educational environment for students from the professional field of Health Care. The established organisation for training in the Medical College is determined by the mandatory components: modern material base; qualified teachers; modern methods of teaching and evaluation of the results of the students' work.

The PhD candidate proves that a good material and technical base is necessary for conducting quality training and mastering professional competences, periodically renewing the available equipment in the classrooms for educational and practical classes, adequate to the novelties in laboratory sciences and practice, and provision of the necessary for practical classes consumables and reagents.

**Pavlina Teneva** found that the forming of professional competence among medical laboratory assistants is a long and complex process, which takes place not



only during their three-year training, but continues to improve even after their professional realisation. An important trend is that any recommendation for curricula and innovations in the training of medical laboratory technicians should move towards competency-based training.

Summarising the results of the conducted research, the PhD candidate analysed six competencies that are of key importance for the professional training of students. With the highest relative share is **“creative application of acquired knowledge”**, followed by the competencies **“teamwork”**, **“communication”**, **“orientation in extreme situations”** and **“making independent decisions”**. The lowest relative share falls on the competence **“dealing in conflict situations”**.

An in-depth analysis of students' views on mastering professional competences through **“practical training in a real working environment”** as well as **“opportunities to use modern information technologies”** and **“involvement of students in scientific research”** was made.

The PhD candidate proves the students' need for additional training on the reviewed problem.

Senior lecturer **Pavlina Teneva** analyses the data provided by the conducted survey of working medical laboratory assistants with work experience in the specialty with a minimum duration of 1 year to a maximum of 9 years. She proves that the organisation of the educational process in a Medical College for mastering competencies applicable to the practice of the profession is directed in the right direction, but the need for additional postgraduate training is also established. As a key competency in their professional training, medical laboratory assistants point first to **“creative application of acquired knowledge”** and **“making independent decisions”** followed by the competencies **“teamwork”**, **“communication”** and **“orientation in extreme situations”**. It is obvious that the competence **“dealing in conflict situations”** is neglected at the expense of the competence **“independence and responsibility”**, which is mastered to a very high degree by the respondents, as well as the competences **“communicative and social skills”** and **“professional competences”**.

The statistical processing presented by senior lecturer **Pavlina Teneva** shows that working medical laboratory technicians possess professional competences that make them **competitive and mobile in the labour market**. **Practical training in a real working environment** contributed to the formation of their professional competences in the process of university education. **The use of modern information technologies and participation in research activities** are not assessed as leading in the formation of professional competence since university education. It is proven that the educational practice and the pre-diploma internship provide opportunities for acquiring skills for independence and responsibility in the performance of professional tasks.



The PhD candidate summarises the opinion of users of health professionals that during their studies, students need to show independence in their work and reduce their adaptation period for working in different types of laboratories, as well as show creativity in non-standard situations.

Theoretical, mathematical and statistical processing of the empirical data is presented, as well as their interpretation in the PhD thesis.

**Pavlina Teneva**, based on the conducted analysis, develops and approves in the training of the specialty Medical Laboratory Technician a **Model for the introduction of an elective discipline: Sources of error in the stages of the laboratory process**. At the core of the PhD thesis is the author's argument that if the developed and proposed model is used, the risk of errors is reduced. Errors in the analysis steps must be minimised to ensure the full quality of laboratory services.

The curriculum focuses primarily on pre-analytical and analytical quality as key areas for improvement in clinical laboratory practice from the perspective of the medical laboratory technician.

The developed **Model for the introduction of an elective discipline: Sources of error in the stages of the laboratory process** is significant in the training of medical laboratory assistants in higher schools. The developed curriculum is up-to-date and necessary for the post-graduate training of medical laboratory technicians for the formation of skills and professional competences to reduce errors in conducting laboratory tests.

The significance of the transformative research is that it is tested in the conditions of a real environment developed and proposed by PhD candidate Pavlina Teneva **Model for the introduction of an elective discipline: Sources of error in the stages of the laboratory process** and a continuing graduate education curriculum.

In the **conclusion**, senior lecturer **Pavlina Teneva** analyses the development of the specialty, which is closely related to the progress of technology, the current and professionally oriented curriculum. The PhD thesis provides information on the training and interrelationship between students, medical laboratory technicians and staff users. The results of the study confirm the hypotheses that there is a need for additional knowledge aimed at the mistakes made in the three stages of the laboratory process, that the formed professional skills and competencies of medical laboratory students meet the modern requirements of laboratory practice for their successful professional realisation.

The summarised **findings** refer to the opinion of **Pavlina Teneva** about the researched problems in the PhD thesis.

The **recommendations** addressed to the Ministry of Education and to the management of the Medical Laboratory Technician specialty in the Medical Colleges will help to form the professional skills and competencies of the specialists.

**The contributions** of the thesis are of a **theoretical-cognitive and applied nature**. They can be formulated as follows:

- ✓ An analysis of the training in the specialty Medical Laboratory Technician was made of Educational qualification degree Professional Bachelor, the need for change was established in the Regulation on uniform state requirements, the curriculum and updating the curriculum;
- ✓ The opinion of students, practising medical laboratory assistants and experts-users of medical laboratory assistants about the level of preparation, acquired theoretical knowledge and formed professional competences in the medical college was studied;
- ✓ The presented model for an elective discipline **Sources of error in the stages of the laboratory process** is an effective implementation of the reviewed problems in the PhD thesis and can be applied in the practice of higher schools training medical laboratory workers and among working specialists.

For the writing of the thesis, **5 applications** were used.

The presented **abstract** fully reflects the content of the PhD thesis.

The PhD candidate presents **three publications** in connection with the PhD thesis, two of which she is the sole author of, and the third of which she is the first author.

The presented PhD thesis with topic: *“Practical training of medical laboratory workers for the forming of professional skills and competencies”* by Pavlina Teneva, in terms of relevance, precision of the methodology, quality of the obtained results and significance of the scientific contributions, is in accordance with the Development of Academic Staff in the Republic of Bulgaria Act and meets the requirements of the Regulations for the Development of the Academic Staff of the MU – Varna.

The stated considerations give me reason to give a **positive assessment** and to propose to the respected members of the PhD Thesis Examination Committee to award a Doctoral degree in the field of higher education 7. Health care and sports, professional direction 7.4. Public Health, scientific specialty Health Care Management to **Pavlina Penkova Teneva**.

30.01.2023  
Sliven

Signature:.....  
/Prof. Elena Grozeva Zheleva, PhD, DSc/