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CONFERRAL OF PROFESSIONAL QUALIFICATIONS UPON FUTURE TEACHERS IN HIGHER EDUCATION INSTITUTIONS: A COMPETENCE-BASED APPROACH, IMPLEMENTATION EXPERIENCE, AND CHALLENGES

Abstract. The article analyzes contemporary approaches to the conferral of professional qualifications upon future teachers in the higher education institutions of Ukraine. It examines the regulatory and legal framework, models for assessing learning outcomes, and key components of the certification of graduates in pedagogical specialties. The challenges faced by higher education institutions in the context of modernizing higher education standards in the field of Secondary Education, implementing a competence-based approach, and meeting the growing labor market demand for the training of a new generation of proactive teachers are outlined. The paper proposes directions for improving conferral procedures with due regard to international trends and the needs of educational practice. It also presents the experience of developing a procedure for the conferral of a professional qualification upon graduates of the educational-professional program Secondary Education (Mathematics and Informatics) within the specialty Secondary Education (Mathematics) at Yuriy Fedkovych Chernivtsi National University. It is proposed to assess the level of formation of professional competencies in higher education applicants using the following tools: portfolio of achievements, self-presentation, interview with simulation of practical work situations. The requirements for the design of a portfolio of achievements are described and the structure of self-presentation is determined. A methodology for assessing the stages of the procedure for assigning professional qualifications to future teachers of mathematics and computer science is developed and criteria for assessing the level of formation of the necessary competencies in higher education applicants to perform the labor functions of a teacher of mathematics and computer science are determined. When determining the tools for assessing competencies, our experience of expert activity in the certification procedures for mathematics teachers and the results of discussions on this issue with various groups of stakeholders were taken into account.

Keywords: mathematics teacher, computer science teacher, certification, learning outcomes, competence, professional qualification, professional standard, labor functions, competence-based approach.



ПРИСВОЄННЯ ПРОФЕСІЙНОЇ КВАЛІФІКАЦІЇ МАЙБУТНІМ УЧИТЕЛЯМ У ЗАКЛАДАХ ВИЩОЇ ОСВІТИ: КОМПЕТЕНТІСНИЙ ПІДХІД, ДОСВІД РЕАЛІЗАЦІЇ ТА ВИКЛИКИ

Анотація. У статті проаналізовано сучасні підходи до присвоєння професійної кваліфікації майбутнім учителям у закладах вищої освіти України. Розкрито нормативно-правові засади, моделі оцінювання результатів навчання та ключові компоненти атестації випускників педагогічних спеціальностей. Окреслено виклики, з якими стикаються заклади вищої освіти в умовах модернізації стандартів вищої освіти за спеціальністю «Середня освіта», впровадження компетентнісного підходу та зростаючих вимог ринку праці до підготовки нової генерації проактивних учителів. Запропоновано напрями вдосконалення процедур присвоєння кваліфікації з урахуванням міжнародних тенденцій та потреб освітньої практики. Описано досвід розробки процедури присвоєння професійної кваліфікації випускникам освітньо-професійної програми «Середня освіта (Математика та інформатика)» за спеціальністю «Середня освіта (Математика)» у Чернівецькому національному університеті імені Юрія Федьковича. Запропоновано проводити оцінювання рівня сформованості у здобувачів вищої освіти професійних компетентностей з використанням інструментів: портфоліо досягнень, самопрезентація, інтерв'ю з симуляцією практичних робочих ситуацій. Описано вимоги до оформлення портфоліо досягнень та визначено структуру самопрезентації. Розроблено методику оцінювання етапів процедури присвоєння професійної кваліфікації майбутнім вчителям математики та інформатики та визначено критерії для оцінювання рівня сформованості у здобувачів вищої освіти необхідних компетентностей для виконання трудових функцій вчителя математики та інформатики. При визначенні інструментарію оцінювання компетентностей було враховано наш досвід експертної діяльності у процедурах сертифікації вчителів математики та результати обговорень даного питання з різними групами стейкхолдерів.

Ключові слова: учитель математики, учитель інформатики, атестація, результати навчання, компетентність, професійна кваліфікація, професійний стандарт, трудові функції, компетентнісний підхід.

INTRODUCTION

The problem formulation. The training of future teachers in Ukrainian higher education institutions takes place amid significant transformations related to the modernization of pedagogical education content, the updating of educational standards, and the strengthening of the competence-based approach. In this context, the primary task of higher education institutions is to prepare proactive professionals capable of effectively responding to the challenges of contemporary education, mastering innovative pedagogical technologies, and acquiring competencies that meet modern labor market demands and educational standards. One of the key mechanisms for confirming a graduate's readiness for professional teaching activity is the conferral of a professional qualification. This process holds not only educational but also socio-economic significance, as it determines employment opportunities and the future career trajectory of a teacher.

Despite legislative regulation and existing attestation practices in national higher education institutions, the relevance of criteria, procedures, and tools for the conferral of qualifications remains a pressing issue. The need to align national approaches with international standards, integrate the Professional Standard "Teacher of a General Secondary Education Institution" (2024) into teacher training programs, and the growing role of digital technologies and practice-oriented training necessitate an update of existing models and mechanisms for the conferral of professional qualifications.

For the first time at the level of an educational-professional program, this article describes and analyzes the procedure for the conferral of a professional qualification upon future teachers based on a professional standard using comprehensive assessment tools.

THE PURPOSE OF THE RESEARCH

The purpose of this article is to analyze the legal framework and current approaches to the conferral of professional qualifications upon future teachers in Ukrainian higher education institutions, identify the key challenges of this process, and outline possible directions for its improvement.

RESEARCH METHODS

The study employed methods of analysis, synthesis, and generalization to examine and systematize the results of scientific research and to identify leading approaches to the study of the stated problem.

RESULTS OF THE RESEARCH

The process of the conferral of professional qualifications upon higher education institutions graduates is regulated by a set of legal documents, including the Laws of Ukraine "On Higher Education" (2025), "On Education" (2025), "On Amendments to Certain Laws of Ukraine on the Development of Individual Educational Trajectories and Improvement of the Educational Process" (2024), as well as the National Qualifications Framework and Professional Standards. A professional qualification (full professional qualification) is a standardized set of competencies and/or learning outcomes acquired by an individual, recognized or awarded/confirmed by a legally authorized entity, and certified by an appropriate document, enabling the individual to perform all labor functions defined by the corresponding professional standard (Article 34 of the Laws of Ukraine "On Higher Education", 2025).

According to the aforementioned legal acts, the conferral of professional qualifications, when professional standards exist, is one of the fundamental responsibilities of higher education institutions in the training of specialists. It is essential to consider labor market demands for professional qualifications and comply with the requirements of the National Qualifications Framework and corresponding Professional Standards.



The issue of the conferral of professional qualifications upon higher education institutions students is relevant and highly debated, especially since each higher education institution, within its autonomy, develops internal regulations and procedures for the conferral of professional qualifications depending on the presence (or absence) of professional standards and in the absence of higher education standards that would regulate the procedure for each specialty. Such a situation negatively affects the improvement of educational-professional programs that provide for the conferral of professional qualifications. Each working group, guided by legislation and the internal documents of the higher education institution, drawing on the experience of academic staff and practicing professionals involved in the implementation of the educational-professional program, develops the procedure for the conferral of professional qualifications. The conferral of professional qualifications should be based on the assessment of learning outcomes against professional standards. In this process, the working group must select the appropriate model, choose effective tools aligned with professional standards for evaluating learning outcomes and confirming the graduate's key professional competencies, and develop assessment criteria, among other aspects. Naturally, many questions and discussion points arise in this process.

The relevance and complexity of the conferral of professional qualifications are confirmed by discussions and coverage on various educational platforms. For instance, a webinar titled "Current Issues of the Conferral of Professional Qualifications in Higher Education Institutions" (November 28, 2024), jointly organized by the National Agency for Higher Education Quality Assurance and the National Qualifications Agency, addressed problem areas arising in the conferral procedures of higher education institutions and emphasized the need for a transparent and separate procedure for the conferral of professional qualifications in educational-professional programs that considers the requirements of relevant professional standards.

Guidance for higher education institutions in developing procedures for the conferral of professional qualifications can be found in manuals developed by the National Agency for Higher Education Quality Assurance and the National Qualifications Agency. In particular, the National Agency for Higher Education Quality Assurance, in the methodological manual "Clarifications on the Application of Quality Assessment Criteria for Educational Programs" (Butenko et al., 2024), defined the requirements for educational-professional programs that provide for the conferral of professional qualifications, the requirements for implementing such programs, and highlighted that, unlike educational qualifications, professional qualifications cannot be automatically awarded upon completion of the educational-professional program. Each higher education institution must have defined principles and procedures for assessing the competencies of students applying for professional qualifications, including tools and mechanisms to verify the student's ability to perform all labor functions defined by the professional standard (Butenko et al., 2024, p. 11).

The "Manual for Assessors of Learning Outcomes for the Conferral of Professional Qualifications" (Kovtunets & Semihina, 2021) serves as a roadmap for higher education institutions, considering the features of learning outcomes assessment when awarding professional qualifications, as distinct from assessment for educational qualifications. The manual promotes a culture of assessment and ensures the quality of evaluating graduates' professional competencies, with particular attention to standardization and international practices of competency assessment.

Despite existing methodological support, the conferral of professional qualifications upon future teachers of general secondary education institutions requires special attention due to somewhat complex legislation and the absence of higher education standards for the specialty "Secondary Education" at the bachelor and master levels, although the Professional Standard "Teacher of a General Secondary Education Institution" exists.

Research on the conferral of professional qualifications upon future teachers has been actively conducted by scholars from the Educational-Scientific Institute "Academy of Teaching" of V.N. Karazin Kharkiv National University. For example, in the article by E. Nikolaev (Nikolaev, 2025), a detailed analysis of the legal basis for the conferral of professional qualifications upon future teachers is provided, along with the "pitfalls" encountered in this process. The article summarizes the requirements for educational-professional programs that provide professional qualifications and suggests tools for assessing graduates' readiness for professional activity. This topic was also discussed during the roundtable "Access to the Teaching Profession: How to Obtain a Professional Qualification?" (2025), which became a platform for discussing professional qualification practices in Ukraine and abroad. Attention was paid to the potential structure of qualification exams and tools for evaluating competencies acquired by future teachers.

The conferral of teacher qualifications is debated because, on one hand:

- Higher education institutions are obliged to award professional qualifications to students in the specialty "Secondary Education," as Article 58, part 3 of the Law of Ukraine "On Education" states: "Individuals who have obtained higher, pre-higher, or professional education in a pedagogical specialty (pedagogical education) shall be awarded a professional qualification by the corresponding educational institution" (Article 58 of the Laws of Ukraine "On Higher Education", 2025);
- the Professional Standard "Teacher of a General Secondary Education Institution" specifies that higher education institutions are authorized by law to award/recognize professional qualifications, and for the qualification "Bachelor Teacher (with specified subject specialties, specializations, or integrated courses)," completion of a first-level higher education program in the pedagogical specialty (or another specialty if the program provides for the conferral of the qualification) is required.

On the other hand:

- according to Article 7, part 3, and Article 32, part 2, clause 11 of the Law of Ukraine "On Higher Education", higher education institutions have the right (not the obligation) to award educational and professional



qualifications to students who successfully complete legally prescribed attestation procedures after finishing the corresponding programs;

- there are no higher education standards for the specialty “Secondary Education” at the bachelor’s or master’s levels that describe the requirements and procedures for the conferral of professional qualifications.

Until recently, many higher education institutions, guided by Article 58 of the Law “On Education”, automatically awarded professional qualifications along with educational qualifications after a single qualification exam or defense, without a separate procedure for assessing competencies and the student’s ability to perform teaching functions. However, this approach does not meet the requirements for educational-professional programs providing professional qualifications, as outlined by the National Agency for Higher Education Quality Assurance: “Unlike an educational qualification, a professional qualification cannot be automatically awarded upon completion of an educational-professional program. The professional qualification is awarded to an individual based on the assessment of acquired competencies and/or learning outcomes in accordance with the professional standard” (Butenko et al., 2024, p. 13). Consequently, during 2024-2025, Ukrainian higher education institutions began actively approving internal documents (regulations and procedures) governing the conferral of professional qualifications. Nevertheless, an analysis of these documents by E. Nikolaev concluded that “the procedures do not contain a detailed description of the key issue for which they are intended: the conditions, step-by-step procedures, specifics, and assessment of learning outcomes and competencies for the conferral of professional qualifications. Rather, the procedures provide that qualifications are awarded based on attestation results and refer to another internal document of the university regulating attestation procedures” (Nikolaev, 2025).

It is evident that a single document in a classical higher education institution cannot account for all specialties; thus, procedures generally outline requirements, conditions, and sequences for the conferral of qualifications, while specific procedures for an educational-professional program are included in the section “Form of Attestation of Higher Education Students” and in the final attestation program.

Thus, at the level of an educational-professional program, effective procedures for the conferral of professional qualifications must be specified and tested.

We describe the procedure for the conferral of professional qualifications upon graduates of the educational-professional program “Secondary Education (Mathematics and Informatics)” at the bachelor level for the specialty “Secondary Education (Mathematics)” at Yuriy Fedkovych Chernivtsi National University. The educational-professional program provides for awarding students the professional qualification “Bachelor Teacher (Mathematics, Informatics)”. The structure, content, and learning outcomes of the educational-professional program align with the labor functions and competencies defined in the Professional Standard “Teacher of a General Secondary Education Institution”. The program ensures the acquisition of the knowledge, skills, and competencies required for teaching mathematics and informatics in general secondary education institutions and is aligned with labor market needs.

According to the “Regulation on the Procedure for the Conferral of Professional Qualifications at Yuriy Fedkovych Chernivtsi National University,” the conferral of professional qualifications upon students who have successfully completed the educational-professional program occurs during the final attestation through a separate procedure and decision of the Examination Board, based on the assessment of professional competencies according to the Professional Standard “Teacher of a General Secondary Education Institution”.

Applicants for higher education are admitted to the procedure for awarding a professional qualification if they:

- Fully meet educational-professional program and individual curriculum requirements;
- Master theoretical material in accordance with the educational-professional program, acquiring the competencies required for the professional qualification and achieving the corresponding learning outcomes;
- Successfully complete practical training, consolidating and enhancing acquired competencies and learning outcomes;
- Pass the qualifying exam for the conferral of the educational qualification.

Assessment of the formation of professional competencies in higher education applicants in accordance with the requirements of the Professional Standard “Teacher of a General Secondary Education Institution” is carried out using tools for assessing acquired competencies: a portfolio of achievements, self-presentation, interviews with simulation of practical work situations. When determining the tools for assessing competencies, our experience of expert activity in the certification procedures for mathematics teachers (2023-2025) was taken into account. The use of such tools allows us to fully demonstrate the acquired competencies to higher education applicants, and the Examination Board to assess the level of acquired competencies for performing the labor functions of a teacher of mathematics and computer science in a general secondary education institution. The Examination Board includes teachers of mathematics and computer science, experts in assessing the professional competencies of mathematics teachers at the third stage of certification of pedagogical workers, and representatives of employers.

Assessment Tools:

1. **Portfolio of Achievements.** Contains students’ work during the educational-professional program, including practicum completion, structured as:

- Lesson plans in mathematics and informatics (at least one for each subject);
- Lesson plans and activity outlines;
- Instructional materials, didactic materials, publications, field-testing data, and professional blogs;
- Certificates, diplomas, awards, and grants;
- Video fragments of lessons or links to them;
- Feedback from placement schools and employment references;



- Reflections on the development of professional standard competencies.

The portfolio must be submitted to the Examination Board 10 working days before the final attestation.

2. **Self-Presentation.** Students present to the Examination Board the following:

- Personal introduction, learning outcomes, and a professional development plan highlighting standard competencies;
- Experience in professional activity, including lesson implementation, innovative approaches, working with special needs students, and the use of formative assessment;
- Collaboration with students and colleagues, joint projects, and notable practice moments;
- Achievements: instructional materials, term papers, lesson plans, extracurricular activities, presentations, publications, certificates, awards, and competitions.

The self-presentation can be delivered in oral, video, poster, or a mixed format, lasting up to 10 minutes.

3. **Interview with Simulated Work Scenarios.** The Examination Board conducts an interview with two simulated scenarios corresponding to the labor functions of the Professional Standard. The student demonstrates readiness to perform:

- Teaching mathematics and informatics (integrated courses);
- Collaborative interaction with education stakeholders;
- Organization of a safe and healthy educational environment;
- Implementation of the educational process;
- Continuous professional development.

A list of sample interview questions is provided in the final attestation program.

Methodology for Assessment.

Table 1

The portfolio is assessed based on the following criteria

Criterion	Description	Maximum Score
Completeness, Structure, and Professional Presentation	The portfolio contains all key sections and is professionally formatted and presented.	10
Quality of Portfolio Materials	Instructional materials align with the subject specialties (Mathematics/ Informatics) and reflect contemporary teaching and educational methodologies.	10
Alignment with Professional Standard Competencies	The portfolio materials demonstrate the level of development of the competencies defined in the Professional Standard.	12 (1 point for each Professional Standard competency)
Reflection	The candidate analyzes their own pedagogical activity and outlines a plan for future professional development.	8 (4 points for activity analysis; 4 points for professional development planning)

Table 2

The self-presentation is assessed based on the following criteria

Criterion	Description	Maximum Score
Completeness of the Self-Presentation	The student presents themselves, their pedagogical experience, and achievements across all key areas.	8 (2 points for each of the four key areas)
Logic, Substantiation, and Demonstration of Professional Standard Competencies	The student delivers a logical and structured presentation, demonstrating the knowledge, skills, and ability to perform the labor functions defined by the Professional Standard.	12 (1 point for each Professional Standard competency)
Alignment of Achievements with Professional Development Goals	The student clearly articulates their professional stance and a professional growth plan.	10 (5 points for the presentation of achievements; 5 points for the professional development plan)

Table 3

The interview with simulated work scenarios is assessed based on the following criteria

Criterion	Description	Maximum Score
Professional Justification	The candidate's response is grounded in pedagogical principles, the analysis of modern teaching methods and technologies, and practical experience gained during the educational program.	10



Flexibility of Thinking	The candidate demonstrates the ability to adapt to the simulated scenario, act autonomously, propose a clear course of action, and suggest alternative solutions.	10
Communication and Professional Ethics	The candidate demonstrates the ability to communicate and interact effectively with all participants in the educational process, while taking into account their cultural and personal differences.	10

The proposed procedure for the conferral of professional qualifications ensures transparency in decision-making regarding graduates' alignment with the professional standard, minimizes formalism in the assessment process through the use of clearly defined criteria and tools, and can also be integrated as a part of an higher education institutions internal quality assurance system.

In the context of updating regulatory approaches to the conferral of professional qualifications, clear procedural regulation of this process at the institutional level becomes particularly important. Legislation emphasizes the responsibility of higher education institutions not only for developing program content but also for defining clear and substantiated mechanisms by which the Examination Board makes decisions to confer or withhold professional qualifications, as well as for ensuring the availability of mechanisms to review such decisions. In this context, the transparency of procedures, the reasoned justification of Examination Board decisions, and the regulation of possible appeals are not merely formal requirements, but essential conditions for ensuring trust in assessment outcomes and the quality of graduate preparation.

CONCLUSIONS AND PROSPECTS OF FURTHER RESEARCH

Analysis of the regulatory framework and practices for the conferral of professional qualifications upon future teachers in Ukrainian higher education institutions demonstrates that this process is complex, multi-level, and requires clear methodological and procedural standardization. In the absence of higher education standards for the "Secondary Education" specialty, professional standards become the key reference for curriculum development, the definition of learning outcomes, and the construction of tools for assessing graduates' professional competencies. At the same time, the automatic conferral of professional qualifications without a separate assessment procedure contradicts modern approaches to quality assurance in education and does not meet the requirements of the competence-based paradigm.

The model for the conferral of professional qualifications upon future mathematics and computer science teachers, piloted at Yuriy Fedkovych Chernivtsi National University, demonstrates the possibility of combining the requirements of the professional standard with practice-oriented assessment tools, such as achievement portfolios, self-presentation, and interviews with simulated professional scenarios. This approach allows for a comprehensive assessment of a graduate's readiness to perform the professional functions of a teacher in secondary education, increases the transparency and justification of the qualification conferral procedure, and promotes the development of a culture of responsible professional growth among students.

Prospects for further research in this area are related to analyzing the outcomes of implementing similar models in various higher education institutions, developing standard recommendations for procedures for awarding professional qualifications in pedagogical specialties, and exploring the possibilities of aligning institutional procedures with national and European approaches to access to the teaching profession. Special attention should be given to studying the impact of such procedures on graduates' professional success and the quality of teaching in secondary education institutions.

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