



Modern approaches continuous professional development of teachers in postgraduate pedagogical education

Iryna Nebelenchuk¹, Hanna Skrypka², Zhanna Fedirko¹, Serhii Burtovyi^{2*} and Andrii Drobin²

¹Department of Theory and Methodology of Secondary Education, Municipal Institution "Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi", Kropyvnytskyi, Ukraine. ²Department of Information and Communication Technologies of Learning and Safe Educational Environment, Municipal Institution "Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi", 25006, 39/63 Velyka Perspektyvna Str., Kropyvnytskyi, Ukraine, Kropyvnytskyi, Ukraine. *Author for correspondence. E-mail: burtovyserhii@ukr.net

ABSTRACT. The study aimed to form a theoretical recommendations of the latest pedagogical approaches for the professional development of teachers in the system of postgraduate teacher education. The methodology includes criteria for analysing the system of postgraduate teacher education and testing the educational programmes for the professional development of managerial, pedagogical and support staff (n = 300) of the Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi, which are focused on the development of general and professional competences of teachers. The research also included a comparative analysis with international practices, specifically drawing insights from the Finnish 'Koulutuskeskus Salpaus' program. Modern postgraduate education in Ukraine is an important element of the system of continuous professional development of teachers, which contributes to the professional development of teachers, improving their professional skills and knowledge. Postgraduate education programmes aim not only to update knowledge in the field of pedagogy but also to train teachers to work in constant changes in society, technology and education. However, the results of the study indicate that the postgraduate education system needs to be improved through the introduction of the latest pedagogical approaches that are constantly updated. The newest pedagogical approaches to postgraduate education aim to transfer knowledge and to develop teachers' critical thinking skills, innovative teaching methods and adaptation to change. Among these approaches are interactive teaching methods, the use of modern information and communication technologies, individualisation of the educational process, and the creation of conditions for teachers' self-education and self-development. It is also necessary to develop competencies in management and communication skills, which allows teachers to work effectively in a team and with students. Improvements to this system are necessary to ensure that highly qualified teachers are trained to meet the current challenges of the educational process.

Keywords: training management; professional development; training programmes; latest strategies; performance evaluation.

Abordagens modernas para o desenvolvimento profissional contínuo de professores na educação pedagógica pós-graduada

RESUMO. O estudo teve como objetivo formular recomendações teóricas sobre as mais recentes abordagens pedagógicas para o desenvolvimento profissional de professores no sistema de formação de professores de pós-graduação. A metodologia inclui critérios para analisar o sistema de formação de professores de pós-graduação e testar os programas educativos para o desenvolvimento profissional do pessoal administrativo, pedagógico e de apoio (n = 300) do Instituto Regional de Formação de Professores em Serviço de Kirovohrad, com o nome de Vasyl Sukhomlynskyi, que se concentram no desenvolvimento de competências gerais e profissionais dos professores. A investigação incluiu também uma análise comparativa com práticas internacionais, tirando especificamente partido das conclusões do programa finlandês 'Koulutuskeskus Salpaus'. A formação pós-graduada moderna na Ucrânia é um elemento importante do sistema de desenvolvimento profissional contínuo dos professores, que contribui para o desenvolvimento profissional dos professores, melhorando as suas competências e conhecimentos profissionais. Os programas de pós-graduação visam não só atualizar os conhecimentos no campo da pedagogia, mas também formar professores para trabalhar em constante mudança na sociedade, na tecnologia e na educação. No entanto, os resultados do estudo indicam que o sistema de pós-graduação precisa ser melhorado através da introdução das mais recentes abordagens pedagógicas, que são constantemente atualizadas. As mais recentes abordagens pedagógicas à educação pós-graduada visam transferir conhecimentos e desenvolver

as competências de pensamento crítico dos professores, métodos de ensino inovadores e adaptação à mudança. Entre estas abordagens encontram-se métodos de ensino interativos, a utilização de tecnologias modernas de informação e comunicação, a individualização do processo educativo e a criação de condições para a autoeducação e o autodesenvolvimento dos professores. É também necessário desenvolver competências em gestão e comunicação, o que permite aos professores trabalhar eficazmente em equipa e com os alunos. São necessárias melhorias neste sistema para garantir que professores altamente qualificados sejam formados para enfrentar os desafios atuais do processo educativo.

Palavras chave: gestão da formação; desenvolvimento profissional; programas de formação; estratégias mais recentes; avaliação de desempenho.

Enfoques modernos para el desarrollo profesional continuo de los docentes en la educación pedagógica de posgrado

RESUMEN. El estudio tenía como objetivo formular recomendaciones teóricas sobre los últimos enfoques pedagógicos para el desarrollo profesional de los docentes en el sistema de formación docente de posgrado. La metodología incluye criterios para analizar el sistema de formación docente de posgrado y evaluar los programas educativos para el desarrollo profesional del personal directivo, pedagógico y de apoyo (n = 300) del Instituto Regional de Formación Docente en Servicio de Kirovohrad, que lleva el nombre de Vasyl Sukhomlynskyi, y que se centran en el desarrollo de las competencias generales y profesionales de los docentes. La investigación también incluyó un análisis comparativo con prácticas internacionales, concretamente con el programa finlandés 'Koulutuskeskus Salpaus'. La formación de posgrado moderna en Ucrania es un elemento importante del sistema de desarrollo profesional continuo de los docentes, que contribuye a su desarrollo profesional, mejorando sus habilidades y conocimientos profesionales. Los programas de educación de posgrado no solo tienen como objetivo actualizar los conocimientos en el campo de la pedagogía, sino también formar a los docentes para que trabajen en un contexto de cambios constantes en la sociedad, la tecnología y la educación. Sin embargo, los resultados del estudio indican que es necesario mejorar el sistema de educación de posgrado mediante la introducción de los últimos enfoques pedagógicos, que se actualizan constantemente. Los enfoques pedagógicos más recientes en la educación de posgrado tienen como objetivo transferir conocimientos y desarrollar las habilidades de pensamiento crítico de los docentes, métodos de enseñanza innovadores y la adaptación al cambio. Entre estos enfoques se encuentran los métodos de enseñanza interactivos, el uso de tecnologías modernas de la información y la comunicación, la individualización del proceso educativo y la creación de condiciones para la autoformación y el autodesarrollo de los docentes. También es necesario desarrollar competencias en habilidades de gestión y comunicación, lo que permite a los docentes trabajar eficazmente en equipo y con los estudiantes. Es necesario mejorar este sistema para garantizar que se forme a profesores altamente cualificados que puedan hacer frente a los retos actuales del proceso educativo.

Palabras clave: gestión de la formación; desarrollo profesional; programas de formación; estrategias más recientes; evaluación del desempeño.

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Introduction

Modern approaches to ensuring the continuous professional development of teachers in the system of postgraduate teacher education are an important aspect of modernising the educational system and improving the quality of education. In the context of rapid changes in society, technologies and teaching methods, the professional development of teachers becomes a necessity to maintain a high level of qualification and performance. Postgraduate teacher education should provide teachers with the opportunity not only to acquire new professional competencies, but also to adapt to changes in curricula, teaching methods, and approaches to learning and student assessment.

One of the main directions of modern approaches is the personalisation of professional development, which considers the individual needs, interests and professional goals of teachers. As such, teachers can choose the best forms and methods of professional development, including online courses, master classes, trainings and webinars. An important role in the process of developing professional skills is played by the integration of digital technologies that allow teachers to carry out continuous learning while maintaining the flexibility and accessibility of programmes (Orlov, 2025). The development of pedagogical competencies

related to innovative teaching methods, critical thinking, emotional intelligence and other modern requirements are emphasised. The professional development of teachers should be based not only on traditional courses and seminars but also on cooperation between colleagues, and participation in professional associations, scientific conferences and projects. Such a comprehensive approach contributes to the creation of an effective system of continuous professional development that meets the modern requirements of educational reform (Vasiuk & Vyhovska, 2023).

Many contemporary scholars addressed this issue and provided many perspectives. For instance, Asare (2023) investigated teachers' pedagogical strategies that reduce students' anxiety in statistics, thereby increasing their engagement and academic performance. This underscores the importance of psychological aspects in teacher development, which is essential for fostering a supportive learning environment. Meanwhile, Belay and Melesse (2024) highlighted the correlation between teachers' motivation for continuous professional development and their participation in professional learning communities, using structural equation modelling to analyse this relationship. Their findings align with the objectives of the current study, which aims to evaluate how such community-based learning can enhance professional identity formation in Ukrainian educators.

Given the growing demand for online education, Biedermann and Ahern (2023) analysed the experiences and needs of teachers working in online environments for nurses in postgraduate education. Their analysis of online educators' experiences highlights the necessity of support systems for teachers working in virtual environments. Godovanets et al. (2018) similarly discuss the benefits of distance education for postgraduate teachers, noting its potential to address the dynamic needs of modern education. This aligns with the findings of the present study, which seeks to evaluate the integration of digital technologies into the professional development of Ukrainian teachers.

The modernisation of approaches to the professional development of research and teaching staff of higher education institutions was studied by Bulvinska (2018), who identifies current trends and challenges of continuous learning in modern education. The study of professional development of teachers who teach subjects 'outside their speciality' was conducted by Faulkner et al. (2019), emphasising the need to support such teachers to improve the quality of teaching. This supports the idea that professional development should be tailored to individual teacher needs, which is a key aspect of the current study's objectives. Innovative approaches to developing online courses for teachers through co-design and active participation were discussed by Fawns et al. (2023). Their work emphasises the value of active teacher participation, a principle that the present study seeks to explore in relation to the integration of the latest pedagogical technologies.

The development of gender-equal strategies for continuous professional development from a socio-cultural perspective was studied by Dhungana et al. (2023). They stress that socio-cultural factors must be considered when designing continuous professional development (CPD) programmes to ensure inclusivity and equality, which directly informs the current study's focus on developing an equitable professional development model for Ukrainian teachers. The role of continuous professional development as a mandatory job function for teachers was analysed by Ivashnova (2021), emphasising its importance for maintaining the professional level of specialists. Shtonda et al. (2022) further refine the concept of CPD by focusing on the formation of research competence among teaching university masters. Their work highlights the intersection of academic research and pedagogical development, suggesting that teacher development should include opportunities for scholarly engagement.

Despite the significant contribution to the study of continuing professional development of teachers, some aspects remain unaddressed. For instance, studies aimed at reducing student anxiety have not sufficiently considered broader techniques that could improve the effectiveness of teaching in various disciplines. Research on the relationship between teachers' participation in professional communities and their motivation does not address the integration of these communities with other forms of professional development, such as individual mentoring or coaching.

The study aimed to form theoretical recommendations for innovative approaches to ensuring the continuous professional development of teachers in the system of postgraduate teacher education. Objectives of the study:

- To describe the main concepts and models of continuous professional development of teachers in the system of postgraduate education.
- To analyse the experience of providing professional development for teachers in the Ukrainian context.
- To evaluate the effectiveness of the educational programmes for advanced training of managerial,

pedagogical and support staff of the Municipal Institution ‘Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi’ based on the survey among teachers and develop recommendations for their improvement.

Materials and methods

The study of postgraduate teacher education assessed the existing approaches, methods and models used to ensure the professional development of teachers. A comparison was made of such programmes as Teacher Innovator, Innovative Technologies in Education (Popova & Vasyleva, 2024), and Interactive Learning Technologies in Circle Time (Mitchell & Reed, 2001). At this stage, the criteria for analysing the system of postgraduate teacher education were determined. The main criteria of this stage were:

- The content of training programmes, namely the assessment of the relevance and compliance of the content of training programmes with modern educational requirements, including the latest methods, innovative technologies and pedagogical practices. The study examined whether the programmes include changes in the educational environment and the needs of teachers.
- Forms and methods of training, which included an analysis of various forms of teacher training (courses, workshops, seminars, webinars, online platforms) and their effectiveness in ensuring continuous development. The study analysed how modern methods, including interactive and distance learning, are used and their ability to engage teachers in the educational process.
- Assessment of the effectiveness of professional development. The study identified criteria for assessment of the effectiveness of postgraduate education programmes.
- Adaptation to changes in education, namely the study of how the system of postgraduate teacher education adapts to the new requirements of modern education, including changes in curricula, technologies, assessment tools and inclusive practices.
- Accessibility and flexibility of programmes, namely the assessment of the accessibility of professional development programmes for different categories of teachers, including teachers from different regions, including those in remote or sparsely populated areas.

The study analysed the educational programmes for the in-service training of managerial, pedagogical and support staff “Pedagogical Case in Professional Activity”, namely, the programmes for the in-service training of pedagogical, scientific and pedagogical staff of educational institutions (field of knowledge: A Education, code and name of speciality: A1 Educational sciences) in the field of postgraduate education for persons with higher education (Anosova & Shevchenko, 2024).

The programmes studied included lectures, practical classes, trainings, master classes and pedagogical practices aimed at improving pedagogical skills and mastering new methods in the field of education. The evaluation was conducted based on a survey among 300 people who completed the postgraduate teacher education programme, including 275 women and 25 men, aged 25-35. Most participants were from the city of Kropyvnytskyi (170 people), another 100 from the Holovanivskyi district and 15 people each from the Oleksandriia and Novoukrayinskyi districts of the Kirovohrad region. In terms of professional affiliation, 280 people are subject teachers from various secondary schools in the region, 12 people are employed as heads of educational institutions in the region, and 8 people are psychologists and social workers in education. The survey was conducted online by sending questionnaires to the participants’ email addresses. The main purpose of the survey was to identify the advantages and disadvantages of postgraduate teacher education programmes. It included several categories of questions aimed at studying the effectiveness of the programme, the satisfaction of participants and its compliance with modern requirements. The questions for this survey were as follows:

- How do you assess the overall quality of the postgraduate teacher education programme?
- How relevant was the content of the programme to your professional activities?
- How do you assess the effectiveness of the forms and methods of teaching used in the programme (lectures, seminars, workshops, online courses)?
- How actively were you involved in the learning process (e.g. through group discussions, and practical assignments)?
- How do you assess the convenience and accessibility of educational materials (textbooks, online resources)?
- How would you rate the level of support from your lecturers during the programme?

- How would you rate the organisation of the training (was it convenient in terms of time and schedule)?
- Have your professional skills changed since completing the programme? How do you assess your ability to apply your knowledge in practice?
- What are the main drawbacks you have noticed in the program? (Open-ended question for specific recommendations or comments).
- How satisfied are you with the postgraduate teacher education programme in general?

To evaluate the programme, a five-point scale was created to reflect the level of respondents' satisfaction, where 1-2 points meant a low level of programme evaluation (survey participants were mostly dissatisfied or did not see significant benefits in the proposed changes); 3 points corresponded to an average level of evaluation (neutral attitude to the programme); 4-5 points – a high level of programme evaluation (positive perception of the survey participants).

Based on the survey, theoretical recommendations for innovative approaches to ensuring the continuous professional development of teachers in the system of postgraduate teacher education were formed and a description of the Finnish programme 'Koulutuskeskus Salpaus', which Ukraine can borrow, was provided.

Results

Postgraduate education is a key component of the professional development of teachers and other professionals. It contributes to the improvement of skills and knowledge necessary for the effective performance of professional duties in a rapidly changing world. Postgraduate education allows teachers to adapt to new educational requirements, use modern technologies and teaching methods, and integrate innovative approaches into the educational process. This not only improves the quality of education but also increases the competitiveness of specialists in the labour market.

According to the Draft Law of Ukraine "On Postgraduate Education" (2014) (Article 1), postgraduate education is defined as a system of measures aimed at in-depth study, updating and expanding knowledge, skills and abilities following the needs of society and the state, as well as changes in the conditions of professional activity. This includes various forms of education that allow for the improvement of professional competence. The Law states that postgraduate education is an integral part of the national education system, the main task of which is to ensure the improvement of qualifications and professional level of citizens and, the development of their competencies, following the requirements of the country's social and economic development. Postgraduate education is substantial in ensuring the sustainable development of professional activities, improving educational standards and raising the level of competence of specialists, which, in turn, has a positive impact on society.

Several postgraduate teacher education programmes in Ukraine focus on the introduction of the latest technologies and methodologies to develop teachers' professional skills. One of them is the Teacher Innovator programme, developed by the Ministry of Education and Science of Ukraine in partnership with online educational platforms such as Prometheus and EdEra (Nebelenchuk et al., 2024). The programme is focused on the development of pedagogical competencies using digital resources, online courses, webinars and interactive teaching methods. It includes both theoretical modules on pedagogical innovations and practical classes on using online platforms to interact with students and colleagues. This enables teachers to master the latest teaching approaches and implement them in their work.

Another programme is 'Innovative Technologies in Education' (Popova & Vasyleva, 2024), implemented by the Institute of Postgraduate Teacher Education. The program aims to improve the skills of teachers through the development of new digital tools and techniques, such as distance learning, the use of interactive learning software and the creation of multimedia materials. The programme provides teachers with the opportunity to improve their pedagogical skills, in the context of using technology for more effective learning. The program covers topics such as using online learning platforms, creating virtual classrooms and working with multimedia resources. Teachers learn how to effectively use online resources to improve interaction with students, which contributes to a better organisation of the learning process. The educational in-service training programmes implemented by the Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi primarily focus on the introduction of interactive methods, such as the creation of interactive learning spaces, training videos, and virtual and augmented realities. This trains teachers to use the latest technologies to create interesting and innovative classes that increase the effectiveness of learning and engage students in the learning process.

An important component of postgraduate teacher education curricula is the relevance and compliance of the programme content with the requirements of modern education. Postgraduate training should provide teachers not only with basic knowledge but also orient them towards the use of the latest methods, innovative technologies and pedagogical practices that meet the requirements of a rapidly changing educational environment. The importance of integrating new technologies, such as digital resources, online learning tools and the use of multimedia in the learning process. The study revealed the importance of integrating new technologies into the educational process of postgraduate teacher education, particularly the use of digital resources, online learning tools and multimedia. Digital resources, such as e-textbooks, online knowledge bases, and platforms for storing learning materials, have great potential to increase teachers' access to relevant information. Platforms such as Google Classroom and Moodle allow teachers to organise and structure learning by providing convenient access to materials, homework and communication with students. Online learning tools, such as webinars, video conferencing and online courses, have become an important part of teachers' professional development.

Distance learning platforms such as Coursera, EdX, and Ukrainian resources such as Prometheus and EdEra allow teachers to acquire new knowledge and improve their professional skills in a format that is convenient for them. They provide the opportunity to learn anytime and from anywhere, which is especially important for teachers working in remote regions. The use of multimedia also plays an important role in ensuring a quality learning experience. Video, audio, and animation materials make learning more visual and engaging, contributing to better learning. Multimedia is used to create interactive tasks, games, and tests that stimulate active participation in learning and increase interest in the subject. Technology creates new opportunities for personalised learning, allowing teachers to more effectively consider the individual needs and level of preparedness of participants in training programmes. In the context of these new approaches, the study emphasises the need to adapt pedagogical programmes to the requirements of the modern educational environment, where the integration of new technologies is a prerequisite for improving the effectiveness of postgraduate education in Ukraine.

An evaluation of various forms of professional development, such as courses, workshops, seminars, webinars and online platforms, revealed how effective these methods are in ensuring the continuous development of teachers. Modern learning methods, including interactive and distance learning, have gained great popularity due to their ability to engage teachers in active participation in the learning process, which is important for ensuring deeper learning. Interactive methods, such as role-playing, group discussions and brainstorming sessions, allow teachers to actively engage with peers and trainers, which helps develop critical thinking, creativity and collaboration skills.

Distance learning has also become an important element, as this enables teachers to learn remotely from the workplace, which is particularly relevant for teachers working in rural and remote areas (Huretska, 2023). This indicates the need for further optimisation and adaptation of methods to the real needs of teachers. While postgraduate programmes provide theoretical knowledge, they do not always provide teachers with sufficient practical training to use new tools in real-world settings. This creates a certain gap between theoretical knowledge and practical activities of teachers, which is an important aspect of improving the effectiveness of programmes.

The study determined that the postgraduate education system does not always respond quickly to changes in the educational environment. Many programmes remain outdated and do not meet modern requirements, in terms of integrating inclusive practices and using the latest technologies. This points to the need to improve the system and quickly adapt to new realities. Many programmes have high time or location requirements, which creates barriers for teachers working in sparsely populated or remote areas. It is therefore important to develop flexible programmes that allow teachers to complete their professional development without having to leave their workplace.

In general, the system of postgraduate teacher education in Ukraine requires significant improvements. It should prioritise the use of the latest pedagogical methods, and interactive and distance technologies, as well as adaptation to changes in the educational environment. It is worth considering this within the framework of a specific programme, namely 'Pedagogical Case Study in Professional Activity'. Incorporation of the needs of teachers and ensuring accessibility of in-service training programmes are important steps towards improving the effectiveness of postgraduate education, as shown in Table 1.

Table 1. Evaluating the effectiveness of postgraduate teacher education programmes.

Question	1 (low)	2 (below average)	3 (medium)	4 (above average)	5 (high)
1. How do you assess the overall quality of the postgraduate teacher education programme?	0%	0%	10%	50%	40%
2. How relevant was the content of the programme to your professional activities?	0%	0%	5%	60%	35%
3. How do you assess the effectiveness of teaching forms and methods (lectures, seminars, workshops, online courses)?	0%	5%	5%	50%	40%
4. How actively were you involved in the learning process (group discussions, practical assignments)?	0%	5%	5%	55%	35%
5. How would you rate the convenience and accessibility of training materials?	0%	5%	10%	50%	35%
6. How would you rate the level of support from your lecturers during the programme?	0%	0%	10%	60%	30%
7. How would you rate the organisation of training (convenience of time and schedule)?	5%	5%	15%	50%	25%
8. Have your professional skills changed since completing the programme? How do you assess your ability to apply your knowledge in practice?	0%	5%	10%	50%	35%
9. What are the main drawbacks you have noticed in the program?	10%	10%	20%	30%	30%
10. How satisfied are you with the postgraduate teacher education programme in general?	0%	0%	5%	50%	45%

Source: Compiled by the authors.

The survey results demonstrated that, in general, teachers were satisfied with the in-service training programme, but certain aspects need to be improved. Most respondents rated the overall quality of the programme as 4 and 5, which indicates a high level of satisfaction with the in-service training course. In particular, 90% of the participants expressed a high degree of pleasure, indicating that the programme fulfilled their expectations regarding quality and relevance. With a sizable majority recognising that the programme met the objectives and goals of contemporary education, this satisfaction was especially noticeable in the way the course material matched the professional activities of instructors.

But the answers also pointed out areas that needed work. Notably, 10% of respondents said they were unhappy with the content of the programme, indicating that it was less helpful than they had hoped. This draws attention to a possible weakness in the way the unique requirements of various learning settings are met. For example, there was a misalignment between instructors' expectations and the program's goals because some geographical differences, such those between urban and rural areas, were not sufficiently addressed in the programme material. This necessitates updating the curriculum to better accommodate these variations, perhaps by adding more information tailored to a given location or implementing instructional approaches that are responsive to context.

Regarding the effectiveness of the learning modalities, 90% of the participants said that lectures, seminars, workshops and online courses were useful. However, 5% of those surveyed highlighted the necessity of increased interaction and participation in real-world activities. Although the theoretical components of the programme were well welcomed, the practical application of knowledge may need additional strengthening, as seen by the absence of adequate practical involvement, especially in the case of instructors from rural areas. To solve this, using more interactive teaching strategies (like role-playing, case studies, and peer feedback sessions) could encourage greater engagement and guarantee that educators can more successfully use their newly acquired information in the classroom.

There are also some comments on the organisation of training. Among the respondents, 10% stated that the time organisation of the course was inconvenient, which could be caused by insufficient consideration of teachers' schedules or difficulty in adapting to the learning format. Therefore, it is worth considering a more flexible approach to time planning and scheduling, including the introduction of evening or weekend modules for those who work in their main job. Most participants rated the learning materials as user-friendly and accessible, but some respondents pointed to the need to update online resources and textbooks as they no longer reflect the latest pedagogical trends and innovations. Updating and systematising the materials will help to keep the relevance of the programme at a high level.

In general, the in-service training programmes for management, teaching and support staff at the Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi have received positive feedback. The weighted average satisfaction score across all questions is 4.14, indicating that, on average, respondents are quite satisfied with the programme. But several aspects still need to be improved. The lowest satisfaction score, indicating a potential area for improvement, was recorded for the 'Main drawbacks noticed' question, with a weighted average satisfaction score of 3.60. This suggests that there were notable concerns regarding the programme that could be addressed. These include more flexible scheduling, increased interactivity of courses, and updated teaching materials, which will help to improve the effectiveness of the programme and make it even more useful for teachers. Modernisation of the postgraduate education system is a necessary step to ensure the professionalism of the teaching workforce and to maintain competitiveness in the labour market.

Modern requirements for education, in particular in the context of the Bologna Declaration and European standards, emphasise the importance of lifelong learning, teacher mobility, partnership between participants in the educational process and readiness for innovation. This poses several strategic challenges for the system of postgraduate education, the main of which is the introduction of innovative approaches that will contribute to the development of the teaching profession and improve the quality of education. An innovative approach to teacher training involves a radical overhaul of managerial and methodological structures, elimination of duplication in their activities, and updating the functions of the management vertical to meet new requirements (Briukhovetska et al., 2024).

Modernisation should be conducted within the framework of predictive models of system development, incorporating both adaptive and qualitative changes, in the context of transforming traditional conservative education into an innovative one. One of the priority areas is the introduction of a competency-based approach to the educational process, which focuses on the development of teachers' key competencies. This includes training that will ensure not only the acquisition of knowledge but also the development of practical skills that can ensure the viability of the individual. Such training should be accessible, dynamic and open to all participants in the educational process, including methodological services, administration and teachers themselves. The initial stages of the innovation process include identifying the need for change, understanding these needs based on the analysis of previous experience, and understanding the need to overcome stereotypes and formal habits. All these stages should be aimed at achieving specific results at forming a viable teacher's personality with the necessary competencies to work in a modern educational environment.

Implementation of innovations in the postgraduate education system should start with a thorough analysis of social needs and identification of the key competencies required for the effective performance of professional functions. This implies constant updating of the content of postgraduate education programmes, development of new teaching methods and technologies, as well as creation of conditions for flexible and dynamic adaptation of the educational system. The task of the innovation process is also to integrate new educational technologies and methods, through the active use of distance learning technologies, online courses, and interactive platforms.

At the same time, traditional forms of education should be supported, and classical approaches should not be abandoned if they are still effective. In the process of modernisation, it is worth addressing not only technological changes but also organisational and methodological aspects. This requires developing new models for managing educational processes, creating effective feedback mechanisms and monitoring learning outcomes. This will allow for continuous improvement of the postgraduate education system and respond to changes in the needs of society.

An important stage of the innovation process is the training of teaching staff at all levels. This includes the organisation of regular training, internships and specialised courses that will enable teachers not only to improve their skills but also to develop professional competence and readiness to adapt to new challenges and changes. Modernisation of postgraduate education also requires changes in the training of educational managers. Managers must possess the strategy of education development, namely, use the necessary forms and methods, and be able to organise and effectively manage innovation processes (Table 2). In this regard, it is necessary to actively involve non-governmental professional organisations and civil society communities that can contribute to the formation of education development strategies.

Table 2. Characteristics of the educational process of the study participants.

Method of continuous professional development	Description	Objective
Thematic improvement cycles	Systematic training in specialised courses aimed at improving specific pedagogical competencies.	Improving professional knowledge and skills in a particular pedagogical area.
Professional internship	Practical training in educational institutions where teachers can gain experience under the guidance of experienced colleagues.	Mastering practical skills in the real conditions of the educational process.
Training at continuing professional development events included in the system	Training that is part of a formal programme of continuing professional development and provides points for certification of teaching qualifications.	Professional development of teachers through formal programmes and certification.
Master class	Demonstration and discussion of the latest teaching methods and pedagogical technologies to share experiences and improve the level of professionalism of participants.	Exchange of best practices, development of new methods and approaches in pedagogical practice.
Simulation training	Teaching practical skills in a real-life environment to develop pedagogical competencies (e.g., teaching lessons, working with students, etc.).	Mastery of specific pedagogical skills to ensure the effectiveness of the learning process.
Training	Collective learning aimed at mastering new professional knowledge and skills on topical issues of pedagogy and organisation of the educational process.	Developing new knowledge and skills among teachers, improving the effectiveness of teaching.
Seminar	Classes on theoretical issues of pedagogy, where participants can discuss the information in small groups.	Discussion of new theoretical knowledge and approaches in the pedagogical process.
Specialist (thematic) school	Training on topical issues of the speciality through lectures and practical classes in small groups, which are combined for better learning.	In-depth training in specific topics of pedagogical practice through theoretical and practical sessions.
Scientific and practical conferences	A gathering of teachers and scientists to share experiences, present research and the latest teaching methods, and disseminate best practices.	Exchange of experience, analysis of the latest research and technologies in pedagogy.
Distance learning	Online courses and electronic resources provide knowledge and certification without physical presence.	Ease of learning, and accessibility for teachers from different regions and with different needs.

Source: Compiled by the authors.

Continuous professional development of teachers ensures their continuous improvement through various forms of training that improve both theoretical knowledge and practical skills. Thematic improvement cycles, training, master classes, simulation training, seminars and conferences provide teachers with the opportunity to develop in specific areas, learn new teaching methods and share experiences with colleagues. Each method has its specifics and goals. For instance, training and master classes are focused on sharing experiences and learning new methods, seminars focus on theoretical issues, and simulation training allows teachers to master specific skills in realistic conditions. At the same time, distance learning can significantly expand access to modern resources and improve skills, providing flexibility in learning. However, to ensure the effectiveness of these methods, it is necessary to constantly update curricula and adapt them to new pedagogical approaches and technologies so that every teacher can acquire relevant knowledge, improve their qualifications and enhance their practical skills.

The implementation of the innovative model of postgraduate education should ensure dynamic adaptation of the system to changes in the social and professional environment, which will improve the quality of education and training of teaching staff. This will contribute to the successful fulfilment of educational and upbringing tasks, increase the efficiency of management structures and create conditions for the continuous development of the educational process. Therefore, it is possible to argue that innovative processes in the postgraduate education system should be aimed at achieving high results in the training of teachers capable of meeting the challenges of the modern educational environment. They should be based on a competency-based approach that will provide not only theoretical knowledge but also practical skills necessary for professional activities that meet the requirements of the times.

Ukraine can borrow from foreign experience. For instance, the Koulutuskeskus Salpaus programme is one of the most successful postgraduate teacher education programmes in Finland, which focuses on the professional development of teachers and is part of the system of continuing education for teachers. The programme offers a wide range of courses and programmes that cover various aspects of teaching practice, from modern teaching methods to the development of teachers' personal and professional skills. It includes an individual approach to learning, which allows courses to be tailored to the needs of participants, providing

personalised training for teachers of different specialities and levels. An important aspect is the active use of technology in teaching, including online resources and interactive platforms, which allows teachers to access education regardless of their location, which is a big plus for the development of distance learning.

In addition to theoretical knowledge, the programme includes practical training and workshops where teachers can improve their skills by learning new teaching methods and approaches to working with students. International cooperation is also an important part of the programme, which allows Finnish teachers to exchange experiences with other countries and get new ideas for the development of education. The Koulutuskeskus Salpaus programme is useful for Ukraine because it focuses on adapting to changes in society and technology, which is important for improving teacher education in Ukraine. The use of modern technologies and individual approaches to participants can significantly increase the effectiveness of teacher education programmes in Ukraine. In addition, international experience and cooperation open new opportunities for knowledge exchange and quality improvement, which is an important step towards improving the system of postgraduate teacher education in Ukraine. Adopting best practices from this programme can significantly improve the level of postgraduate teacher education and help integrate innovative methods into the Ukrainian education system.

Thus, for the further development and effective transformation of the regional system of postgraduate teacher education, it is necessary to involve a wider range of stakeholders in management processes. The system should involve all those who influence learning outcomes, including parents, members of school boards, associations and administrative staff. In this context, adult learning should be diversified, especially through peer learning, pedagogical research, the development and evaluation of innovations, collective creativity and partnerships. It is also necessary to implement changes to the management and methodological structures: from traditional instructional and methodological functions, they should move to supporting and actively assisting educators in mastering new roles such as teacher-researcher, leader of creative and problem groups, participant in strategic planning, project coordinator, tutor, etc. This is a part of the innovative processes in the regional system of postgraduate education, which should become the basis for further changes that will ensure the efficiency of the institute and bring the system of continuing education for teachers to a new level of quality.

Discussion

The importance of introducing modern approaches to the continuous professional development of teachers is a prerequisite for adapting the educational system to modern challenges. The study confirmed that this development contributes to the improvement of pedagogical skills and the enrichment of professional knowledge, which subsequently has a positive impact on the quality of learning. Analysis of the works of other researchers shows the importance of various aspects of this process. For instance, Kalaur (2023) considered approaches to ensuring the professional development of teachers in the higher education system, emphasising the importance of integrating new pedagogical technologies into educational processes to improve the qualifications of teachers. Kurysh (2020) studied the role of postgraduate teacher education in shaping the readiness of teachers to develop entrepreneurial competence in high school students, which is consistent with the results obtained, emphasising the importance of professional growth for the development of students' competencies.

Dyka and Mykytenko (2023) analysed the formation of a teacher's creative personality, which is especially relevant in the context of modern education, which requires new approaches and innovations in teaching. The results of this study are similar to the findings of the previous one, as they also showed the importance of creativity in the professional development of teachers. Similarly, Anishchenko (2022) confirmed the effectiveness of distance learning technologies for teachers in postgraduate education, which is relevant considering the pandemic conditions and the need for distance learning. Lee et al. (2023) analysed continuous professional development within the experience of a primary school in Hong Kong during the pandemic, emphasising the role of technology in supporting continuous learning. The study confirmed that the introduction of technological tools is a key factor for continuous professional development in the face of current challenges, in line with the results obtained in this paper.

Nanda et al. (2024) investigated innovative pedagogical methods and learning frameworks that improve the quality of postgraduate teacher education, emphasising the need for continuous professional development. The results of this study are similar to the findings of the previous one, highlighting the

importance of developing modern programmes for the continuous improvement of teachers. In the work of Nebelenchuk et al. (2024) emphasised the need for organisational and pedagogical conditions to ensure continuous professional development, addressing the role of systematic learning. This approach was also found in the current study, where considerable attention is paid to organisational aspects and the creation of conditions for continuous professional development. Professional development as a means of self-reflection of teachers, which emphasises the importance of personal growth in postgraduate education, was highlighted by Palko (2021). The findings support these conclusions, as they indicate the importance of teachers' self-development in the process of continuous learning.

The potential of postgraduate education in the development of primary school teachers' evaluation competence was analysed by Pokrova (2022), which is consistent with the results obtained, as both works emphasise the importance of postgraduate education for the development of competencies. Sadeghi et al. (2019) examined the practice of e-pedagogy in higher education, noting the importance of digital technologies for professional development. The results of the study confirmed the need for digital tools to support the professional development of teachers, which correlates with the findings of S. Sadeghi et al. (2019).

The professional development of teachers is a key aspect of modern education, and many studies emphasise the importance of different approaches and forms of learning to improve the qualifications of teachers. Slozanska et al. (2023) highlighted the professional development of inclusive education teachers in formal and non-formal learning settings. They emphasised the importance of combining different forms of learning, which allows teachers to effectively adapt to the diverse requirements and needs of students. This study confirmed the importance of combined teaching methods that contribute to the professional development of teachers, including in the context of inclusive education. Another important aspect is the introduction of modern technologies into the educational process.

Sovetkanova et al. (2021) studied innovative teaching methods in postgraduate teacher education, focusing on the importance of technology for improving the learning process. They emphasised that the integration of the latest technologies makes learning more accessible and flexible, contributing to the development of pedagogical competencies. The current study confirmed these findings, emphasising the need for ongoing innovative support in the professional development of teachers. Lifelong learning is also an important factor for the professional development of teachers. Talwelkar et al. (2024) examined the importance of continuous personal development and how it can be achieved, emphasising that regular professional development is a prerequisite for meeting the demands of a modern profession. This study confirmed that continuous learning contributes to a significant increase in the professional competence of teachers, which in turn has a positive impact on the quality of education. It is equally important to study the historical aspects of teachers' professional development. Tarasova (2020) highlighted the historical context of teachers' professional development, emphasising the importance of considering the experience of previous generations as a basis for the further growth of education professionals. The current study confirmed that considering historical factors can help in a deeper understanding of modern professional development processes, providing additional opportunities for improving approaches to teacher training.

In the context of professional development of teachers, it is worth analysing different approaches and models that allow to ensure an effective learning process and promote sustainable development of education. Ermolaeva and Ignatyeva. (2021) addressed the professional and personal development of teachers in the context of sustainable development. The author emphasised that professional development is a key factor in ensuring the sustainability of the educational process. The results of this study confirmed that continuous improvement of pedagogical skills and competencies is an important aspect that allows for achieving sustainable development in the education system.

Another study conducted by Vorotnykova (2018) analysed models of professional development of teachers in the context of the reform of postgraduate teacher education. The author noted that each model of professional development should be adapted to the specific conditions and requirements of the educational system. This study has confirmed that the variety of professional development models allows them to be adapted to changes in the education system, which in turn contributes to the flexibility and effectiveness of the process of teacher development.

Ward and Mars (2020), and Kovalskaya and Ohryzko (2024) addressed the issue of continuous professional development of physical education teachers, noting that specialised training programmes are a prerequisite for maintaining high qualifications of teachers in this field. They emphasised the importance of developing and implementing programmes that would allow physical education teachers to continuously improve their

skills and increase their level of competence. This study has confirmed the importance of such programmes for teacher development, which is also supported by the findings of other authors on the importance of continuous teacher development.

Another important aspect is the motivation of teachers to participate in CPD programmes. Zhang et al. (2021) investigated how teachers' motivation as well as school-level support affect participation in development programmes. They emphasised that having support from administration and colleagues is an important factor that contributes to teachers' engagement in such programmes. This study confirmed the importance of school-based support in improving professional development programmes and contributing to the professionalism of teachers.

In summary, the results of the study emphasise the importance of using integrated, adaptive approaches to the continuous professional development of teachers, as well as the need for their further support and improvement through modern programmes and technologies that meet the requirements of modern society.

Conclusion

Postgraduate education for pedagogical staff in Ukraine is an important element of the education system that provides advanced training for teachers, educators and other professionals in the field of education. It is the basis for the development of professional competencies of teachers, enabling them to perform their duties effectively in the face of constant changes in education and society. Currently, various postgraduate education programmes in Ukraine cover different aspects of teaching. These programmes include various forms of education: lectures, seminars, workshops, and master classes, which allow participants to update their knowledge and skills following the latest educational standards. However, the results of the survey among teachers who participated in the study of in-service teacher education programmes indicate that certain problems need to be improved. Most respondents rated the programmes as quite useful but noted that several aspects need to be significantly improved.

Respondents pointed to the need for more interactive forms of learning, such as practical classes, workshops, and case discussions, which would allow them to apply theoretical knowledge in practice. In addition, participants expressed concern about the lack of accessibility of training materials, for distance learning, which may be important in the context of modern technologies. There are also comments about the length of postgraduate programmes. Most teachers believe that training courses need more breaks between classes, as well as a better combination of theoretical and practical classes. At the same time, respondents noted that training and workshops are useful but often do not provide enough time to fully absorb the material and develop new skills.

To improve the postgraduate education programme in Ukraine, it is necessary to introduce innovative approaches to the learning process. This includes the wider use of modern technologies for distance learning, the creation of platforms for the exchange of experience between teachers, and the improvement of the practical component of programmes, which will allow teachers to apply the acquired knowledge more effectively in their daily work. Incorporation of these aspects into postgraduate education programmes will improve the effectiveness and relevancy of the needs of modern teachers.

The limitation of the study is determined by the insufficient number of survey participants and their objective experience of studying in other postgraduate education programmes for teachers, which does not fully cover all possible approaches and models. Prospects for further research may focus on modern international postgraduate education programmes in the context of adapting innovative methods.

Data availability

Data sharing is not applicable to this article

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INFORMATION ABOUT THE AUTHORS

Iryna Nebelenchuk: Senior Lecturer at the Department of Theory and Methodology of Secondary Education in the Municipal Institution "Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi", Kropyvnytskyi, Ukraine. PhD in Pedagogics. Her research interests include continuous professional development of teachers, innovative pedagogical approaches, and postgraduate teacher education.

ORCID: <https://orcid.org/0000-0003-2778-5381>

E-mail: inebelenchuk@outlook.com

Hanna Skrypka: Head of the Department of Information and Communication Technologies of Learning and Safe Educational Environment in the Municipal Institution "Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi", Kropyvnytskyi, Ukraine. PhD in Pedagogics. Her research interests are teacher training program effectiveness, evaluation of teacher competencies, and interactive and distance learning methods.

ORCID: <https://orcid.org/0000-0001-9120-7581>

E-mail: h-skrypka@hotmail.com

Zhanna Fedirko: Head of the Department of Theory and Methodology of Secondary Education in the Municipal Institution "Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi", Kropyvnytskyi, Ukraine. PhD in Pedagogics. She is interested in professional development programs for educators and personalisation of teacher education.

ORCID: <https://orcid.org/0000-0001-6125-8724>

E-mail: z.fedirko@outlook.com

Serhii Burtovyi: Deputy Director at the Department of Information and Communication Technologies of Learning and Safe Educational Environment in the Municipal Institution "Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi", Kropyvnytskyi, Ukraine. PhD in Pedagogics. His research interests are adapting teacher education to modern educational requirements, competency-based approaches in teacher training, and development of pedagogical and management skills in education.

ORCID: <https://orcid.org/0000-0002-2254-9227>

E-mail: burtovyiserhii@ukr.net

Andrii Drobin: Senior Lecturer at the Department of Information and Communication Technologies of Learning and Safe Educational Environment in the Municipal Institution "Kirovohrad Regional In-Service Teacher Training Institute named after Vasyl Sukhomlynskyi", Kropyvnytskyi, Ukraine. PhD in Pedagogics. His research interests include educational reforms in postgraduate education, accessibility and flexibility in teacher training programs, and inclusive education practices in teacher development.

ORCID: <https://orcid.org/0000-0002-4414-0465>

E-mail: a_drobin@hotmail.com

Note:

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Terezinha Oliveira (UEM)

ORCID: <https://orcid.org/0000-0002-9841-7378>

E-mail: teleoliv@gmail.com

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