Implementation of Innovative Educational Technologies in the Training of Specialists in Pedagogy and Psychology (European Experience)

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Abstract

The modern development of educational services market dictates new rules for the use of technologies in education. The purpose of the article is to analyse the introduction of innovative educational technologies into the system of training specialists in pedagogy and psychology based on available European experience. For its implementation, the methods of comparative analysis, concretisation, and generalisation were used. They facilitated the task of characterising the key features of the organisation of innovative educational space on the example of the activities of modern universities in EU countries. In the results, the general principles of transformations in the training of specialists in pedagogy and psychology were analysed, the definition of innovative technologies in the modern understanding of their use in personnel training is given. The experience of teaching and using innovative technologies in Latvia, Romania, and Germany, France (Sorbonne University, University of Karlsruhe, University of Latvia and others) is summarized. One emphasises on the importance of using this experience, which enables students of higher education learning independently, to accumulate knowledge in a non-traditional way by using information and communication technologies and other innovative methods. Important for future use are projects on improving students' multimodal writing practice skills, developing their research skills using modern media libraries and open access informational didactic materials. In the conclusions, it is determined that outside the EU, the system of training specialists and openness to the perception of reforms need further improvement.

Keywords: innovations, educational technologies higher education institutions, European experience

1. Introduction

The modern development of digitalisation and information technology on a global scale affects all spheres of human life. This is also true for educational processes, as they play a leading role in the functioning of modern society. According to many researchers, education should be realised as a separate branch of human creation, determining its future through the prism of the institution of socialisation, intellectualising the introduction of mechanisms for harmonising social consciousness and its capabilities in perceiving civilizational changes into its sacred and spiritual dimension. Turning to the active use of the latest technologies has made it possible to optimise many educational elements, but further development is the next challenge that needs to be addressed.

A separate issue for detailed consideration is the use of innovative educational methods and technologies. They are based on using modern technological achievements and online systems experience. Under current conditions, the traditional training of specialists in European universities, which focused on the creation of knowledge, skills and abilities in a particular area, cannot meet modern social demands. In order to implement the planned changes, the educational space of the EU member states needed to improve the quality of education for higher education students, which was laid down in the foundations of the Bologna Process - academic mobility, mutual recognition of diplomas,

introduction of credit-module systems, invariant technologies of the educational process and knowledge management. These processes were analysed by Bondar et al. (2020) and Curry & Docherty (2017). Zdanevych et al. (2020) evaluated the peculiarities of the modern educational process for the training of psychologists and teachers. Wedari, Fatihah & Rusmanto (2022) addressed a similar issue, emphasising the peculiarities of using digital learning tools in their study. Prullage (2019) drew attention to the importance of a competency-based approach to teaching in modern higher education institutions. At the same time, the key aspects of multicultural competence development are described in Cherng & Davis (2019). The peculiarities of information literacy formation are traced in the study by Stephanidis & Antona (2022).

Namestiuk (2022) drew attention to the latest trends in pedagogical and psychological disciplines in higher education. The conclusions of Curry & Docherty (2017) are valuable for understanding the current value of competences in learning. The emphasis on the need for digitalisation of education was made long before the global COVID-19 pandemic, so the authors studied this issue before it became extremely popular in research circles. The achievements of the predecessors were positively assessed by Pinheiro & Santos (2022), who also highlighted the prospects for using distance education in combination with the latest digitalisation methods. Similar issues were addressed by Laufer et al. (2021), who tried to determine the future development of education and also noted the problems in the use of distance learning. The attitude of students to digital online technologies is described in Baber (2020). At the same time, the key aspects of the use of digital technologies and the peculiarities of their implementation are described in detail in the study by Zawacki-Richter & Jung (2023). Suri & Chandra (2021) describe the main practices of introducing the trend of multiculturalism into educational paradigms of our time.

However, the potential of innovative teaching technologies has not been fully explored, as new paradigms are being introduced into practice. In addition, the socio-economic circumstances of social formation have been changing. For this reason, there is a need for further modernisation of the educational process, rethinking the theoretical foundations and the preserved experience of practical use of the functioning of higher education institutions. Higher education institutions are increasingly embracing digital pedagogies to enhance flexibility and individualization in teaching methods. A comprehensive meta-analysis of research conducted until December 2021 suggests that the integration of various digital pedagogy technologies, such as video tutorials, mobile apps, flipped classrooms, and virtual reality, yields positive results, fostering innovative teaching strategies that improve both student and teacher pedagogical performance (Tsekhmister, 2022).

The experience of teaching pedagogy and psychology in European universities can be useful for developing countries. Therefore, the study of the relevant structures becomes an urgent task. The purpose of the article is to analyse the introduction of innovative educational technologies in the system of training specialists in pedagogy and psychology based on available European experience.

2. Method

The study is based on a selected set of related methods and principles of pedagogical cognition. The article applies the methods of comparative analysis, concretisation of generalisation in order to characterise the key features of the organisation of innovative learning space on the example of modern European universities. Appealing to the corporate-pedagogical characteristic contributed to the comparison and identification of unique approaches to the training of future teachers and psychologists in modern educational systems. Based on the dialectical method of research, the process of using innovative technologies in education is considered as one that is constantly changing and developing. As a result of the use of forecasting, the main prospects and further directions for the introduction of innovative technologies in the European education system are discussed.

The study is based on the analysis of legislative materials. Particularly, the main focus is on the Digital Education Action Plan (2021-2027), which organises educational services at EU universities. The work is also based on a content analysis of the curricula of universities in Latvia, Germany, and France. Also, it was important to study educational journals and publications. Review academic journals, research articles, and conference proceedings in the fields of education, pedagogy, psychology, and technology were useful for investigating the purpose of the paper.

3. Results

3.1 Innovative Technologies: Modern Definitions and Applications

An important modern benchmark in the training of specialists in pedagogy and psychology is the integral ability of

graduates of higher education institutions to perform professional duties (Zdanevych et al., 2021). This refers to the acquisition of complex integral qualities, which are realized as a combination of the acquisition of the necessary skills and knowledge and the independent development of university graduates. According to European experience, the constituent elements of such integral training include the psychological component, which is based on the primary understanding of the importance of mastering professional skills and work skills, the practical component necessary and sufficient for the formation of practical qualities and skills, understanding the need for self-improvement and development throughout life (particularly, after obtaining a relevant diploma) (Zdanevych et al., 2022). For this reason, the purpose of the modern educational process in the field of psychology and pedagogy at European universities is aimed at actualising the need for independent work on integral readiness, accumulation of mandatory experience, and development of self-stimulation. Therefore, the introduction of modern innovative technologies in education plays an important role in this process. The current requirements of the labour market can be outlined in a special figure (See Fig. 1).

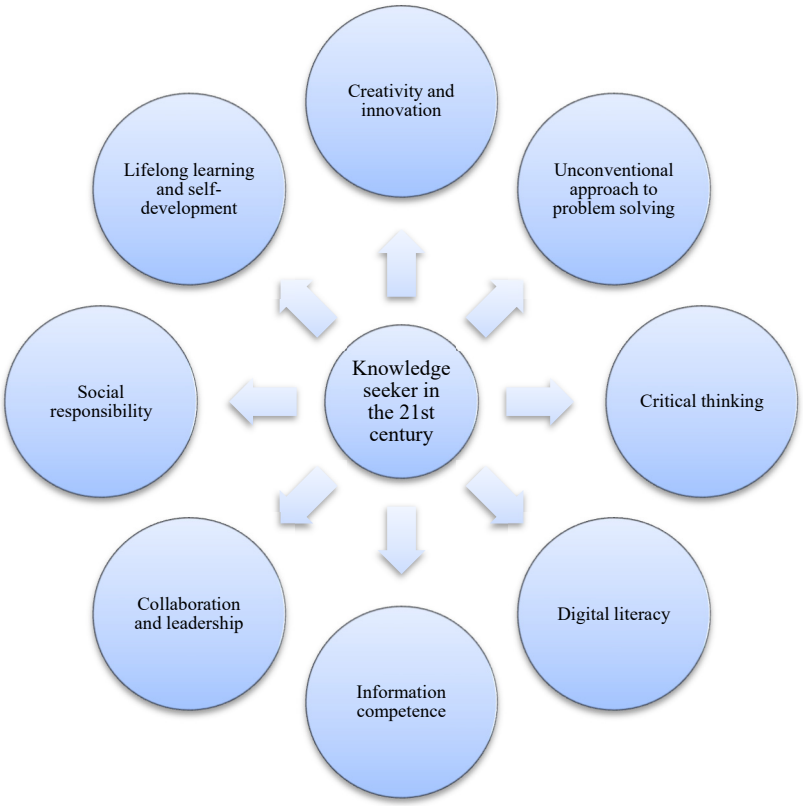

Figure 1. The Important Skills in 21th Century

Source: Masril et al. (2019).

The concept of "innovative technologies" is not new to the European educational system. This term is usually understood as a system or a set of methods for acquiring knowledge and its transfer through the interaction of teachers, students and information and communication technologies, which is generally aimed at achieving a certain result during the educational process, which allows to expand didactic opportunities in the process of further independent work of higher education students (Bondar et al., 2020).

The tangible and dynamic transformations of the world economy, the growing essence of innovative aspects of development have formulated a significant increase in the role of higher pedagogical and psychological education. First of all, it is about the most important factors that contribute to improving the quality of human capital, which in turn increases the competitiveness and stability of social development. The main task of innovation is to create change. It can be assumed that innovative technologies in the system of training teachers and psychologists are aimed at creating targeted changes designed to move educational systems from one state to another.

The use of innovative technologies helps ensuring the flexibility of the educational process, its variability, the evolution of the content, methods and forms of information flow, conducting training sessions, choosing the level of complexity and scope of tasks, the peculiarities of their implementation, activating the educational and cognitive activity of higher education students through the use of productive forms of learning (for example, paying attention to game elements, additional motivation and mobility, etc.)

As a result of students' independent work and the use of information and communication technologies, differential and systemic pedagogical approaches are implemented. The former allows making learning more accessible, improve its quality, introduce innovative digital technologies, resources, etc. The systemic approach is characterised by the active use of information technologies, which form not only the systemic nature of the educational process, but also update the structural and functional relationships of educational materials. Innovative educational technologies are used to increase interest in education, to teach students to master the material independently, to be competent and mobile, quickly adapt to the requirements of the labour market and modern social development (Bakhmat et al., 2022).

Therefore, information technologies play an important role in organising independent work, as they allow students to study independently, accumulate knowledge in an unconventional way through the use of information and communication technologies, expand opportunities for creative self-development, identify extraordinary approaches to solving typical and atypical situations in the pedagogical and psychological fields, and move from primary to higher levels of perception. European universities actively use educational websites; work with digital publications, and individual projects based on information technology to study (Laufer et al., 2021). Additionally, current and final certification is organised, which usually takes place electronically.

Researchers note that individual, frontal forms of education are now considered standard, while collective forms are just beginning to develop and are considered fundamentally new in the modern educational system (Laufer et al., 2021). The use of traditional teaching methods has led to higher education students partially losing interest in educational work. Excessive conservatism in teaching pedagogical disciplines and psychology is not welcomed, but the use of non-standard solutions is becoming an actual trend.

Among the many non-standard classes are business games, conferences, competitions, role-playing games, project-based approaches, workshops, creative tasks, excursions, etc. The introduction of modern technologies into the educational process transforms the roles played by teachers, who turn into consultants, advisors, and tutors. These changes are the reason why academic staff needs special psychological and pedagogical training, because in the course of their professional activities, teachers implement not only exclusively specialised knowledge, but also innovative materials in the field of pedagogy and psychology, technologies for organising the educational process in general, and educational functions (Lengetti, 2020). Based on this, teachers form their own assessments of the possibility of implementing innovations in the educational process.

Important elements of training in European higher education institutions are interactive forms of learning and multidisciplinary integration (Lengetti, 2020). These important aspects have not lost their relevance in the current processes of teaching students of pedagogical and psychological specialties (Rakhimov & Mukhamediev, 2022).

Case-based learning has emerged as a prominent and effective student-centered teaching approach in medical and pharmacy education, offering students the opportunity to apply theoretical knowledge to real-world scenarios, as demonstrated by a meta-analysis of 21 randomized controlled trials conducted through April 2023. The findings underscore that case-based learning not only enhances academic performance but also strengthens students' analytical skills, making it a valuable and active pedagogical method for medical and pharmacy undergraduate education (Tsekhmister, 2023).

Their use can also help to achieve higher motivation for learning, enhance creative, productive thinking, communicative culture, and improve interpersonal relationships. Therefore, the use of active configurations and methods of education increases the requirements for teachers, who now have to act as organizers of cognitive activity of higher education students, and not as simple repeaters of information (Zdanevych et al., 2020b). Modern European teachers who train specialists in pedagogy and psychology must have the skills to create a business and creative environment, master the art of dialogue, discussion, and encouragement to be independent in gaining additional knowledge and skills.

3.2 European Experience of Innovative Technologies in the Field of Pedagogical and Psychological Higher Education

It is important to compare the adoption and impact of innovative technologies in higher education across different

European countries and investigate potential factors influencing the adoption rate, such as policy frameworks, funding, and cultural considerations. The Bologna system of education has influenced the formation of "openness to dialogue, cooperation, and international construction of education, which goes far beyond the system of quality assurance or credits" (Pinheiro & Santos, 2022, p. 114-115). Taking into account the social dimension of learning and teaching, modern European universities are preparing to promote the development of various general competencies, taking into account current trends in the labour market and the values of EU education policy. Therefore, the main innovative principle of organising education is the competency-based approach, which involves the development of students' competencies that can facilitate their entry into professional life and ensure speed and adaptability to any changes. Examples of such competencies and skills are multilingualism, information competence, digital, social skills, leadership development, and joint and cooperative work (Prullage, 2019). Implementing innovative learning skills involves the use of certain strategies aimed at directly engaging students in interdisciplinary research and learning processes. An example of this is active methods that influence the formation of independent learning, entrusting students with the organization of their own learning process by choosing courses.

Some of the broad areas of application of the principles are science, technology, engineering, and mathematics. Taking this concept into account, European universities are actively implementing STEM education technologies. In order to train the future generation of STEM professionals, European universities are ready to devote a lot of time to prepare teachers for globalisation challenges, given the fact that among all areas of study, innovative digital technologies have important opportunities in STEM education (Bashynska et al., 2021). For example, in order to train modern, competent professionals, the University of Aveiro (Portugal) promotes the preparation of its teachers for digital transformation through the organisation of alternative teaching and learning projects for digital STEM students. The University of Aveiro, by implementing the Docência+ targeted program, provides digital development opportunities for both teachers and students. The goal of this program is to enhance core pedagogical competencies, covering the training of core innovative methodological teachers and students. At this Portuguese university, close attention is paid to the formation of a digital learning environment and a digital culture of communication between students and teachers (Zdanevych et al., 2020a). In addition, in the system of training future teachers, courses aimed at developing media education, digital literacy, and information technology are important, as they influence the formation of specialists ready for any digital transformation. For example, exploring online communities, forums, and professional networks where educators and researchers discuss their experiences with integrating innovative technologies are also important. This can provide insights into emerging trends and best practices.

European higher education institutions have been embracing innovative technologies to enhance pedagogical and psychological education in a rapidly evolving educational landscape. These institutions recognize the transformative potential of technology to improve learning outcomes, engage students, and advance research in the fields of pedagogy and psychology. Here are some notable aspects of the European experience with innovative technologies in pedagogical and psychological higher education. European universities are integrating technology into traditional classroom settings through blended learning approaches. Online learning platforms, such as learning management systems (LMS), enable educators to deliver course materials, assessments, and interactive activities digitally. This flexibility accommodates diverse learning styles and encourages self-paced learning while fostering collaboration among students. Also, European institutions are leveraging data analytics to gain insights into student performance, behavior, and learning patterns. Learning analytics tools help educators identify struggling students early and provide personalized interventions. In psychology education, data analytics can facilitate the assessment of cognitive development and emotional well-being. Online collaborative tools, such as discussion forums, wikis, and video conferencing platforms, facilitate peer-to-peer learning and knowledge sharing. European educators are using these tools to encourage social learning, enabling students to collaborate, exchange ideas, and co-create knowledge irrespective of geographical boundaries. These results are proved by the analysis of European educational practices.

The Latvian education system is somewhat different from the Portuguese one. However, the functioning of universities is based on European education development programs, and the main focus is on the implementation of integrated learning. Particularly, the University of Latvia (located in Riga) includes the Faculty of Education, Psychology and Art, which promotes the further development of important humanities - education, psychology, design, and art. This faculty implements various studies in the field of educational management, focusing on the development of critical thinking and leadership skills in students (Faculty of education, psychology and art, n.d.). In addition, the faculty is a platform for advanced training for Latvian teachers and psychologists. The University of Latvia enables future teachers and educators to receive an appropriate level of education in accordance with the School 2030 concept and to further their scientific and pedagogical careers. Practicing teachers and researchers (the university works closely with various research institutes) have the opportunity to improve their knowledge, skills,

and competencies by participating in various professional development programs (Faculty of Education, Psychology and Art, n.d.). Faculty members, along with university students, are actively involved in various international research initiatives, research projects, and scientific conferences. The combination of the princes of education, psychology, and art forms an important basis for the implementation of innovative concepts and ideas. Teachers, linguists, art historians, designers, psychologists, information science and education management specialists form an original environment for the implementation of creative concepts and innovative pedagogical ideas, which in turn improves student motivation and contributes to their self-improvement. Given the current trends in the labour market, any specialty obtained at such an integrated faculty gives such students advantages in the labour market, as training develops creative skills, critical thinking, information competence, social skills, which generally contributes to the development of a personality - a professional of the future (Namestiuk, 2022). The curriculum in Pedagogical Sciences was developed in cooperation with partner universities and other research institutes. This integrated approach allows us to train specialists through the prism of theoretical, practical and scientific knowledge.

The Faculty of Psychology and Educational Sciences of the University of Bucharest contribute to the formation of specialists in pedagogy and psychology through the introduction of modern curricula, practical research, and the promotion of scientific developments (The faculty of psychology and educational sciences, 2022, November 16). It is worth noting that the University of Bucharest is a national leader in many scientific fields of research, so the emphasis is on developing students' search skills and interest in research. This perspective includes clearly defined areas of action for students' professional development, expert work, counselling, and research. A separate part of this system is the support of quality educational and psychological services focused on human social development. The analysed faculty is constantly striving for the social responsibility of the faculty in public life. This is realised primarily through the involvement of teachers and students in programs of high social importance: specialised consultations, trainings on urban and rural education, social and educational assistance projects, various projects of psychological recovery and social reintegration, etc. However, the key to the system of training pelagic and psychologists is a personality-oriented approach, which is implemented through innovative teaching methods and close attention to the learning outcomes of each student. The faculty also has a special department for distance learning, continuing education and professional conversion. This helps to develop the modern concept of “lifelong learning”, which is especially popular in European countries.

Currently, in European universities, the training of teachers and psychologists is implemented through the prism of determining a narrow choice of disciplines for students to study in order to ensure future professional activities (Orozonova, Alamanova, & Kazakov, 2021). For example, at the German University of Applied Sciences in Karlsruhe, there are eight compulsory subjects in the 1st year of bachelor's degree program; the rest are elective, which the student chooses depending on their specialisation, preferences, or where they intend to work after graduation. The Faculty of Education at the University of Frankfurt focuses on the formation of specialised training using modern information and communication technologies. At the same time, the main attention is paid to the individual work of students, which is implemented on the basis of project-based learning methods. At the same time, an innovative approach to organizing education in German universities is the principle of ecologisation. It is about forming environmental competence in modern students through respectful attitude to the environment and developing a healthy lifestyle. However, in the system of training future teachers, great importance is attached to the formation of critical analysis, information and digital competence. To this end, special courses are being introduced in media education, information technology, and digital communication culture. Also, gamification techniques are being used to enhance student engagement and motivation. European educators are designing gamified learning experiences that incorporate game elements, such as challenges, rewards, and competition, to transform mundane educational content into interactive and engaging experiences.

In French universities, classes are organised according to a modular system (i.e., thematic blocks). Students accumulate a certain number of modules throughout their studies, and the exact number of modules they have completed is recorded in their diploma (Curry & Docherty, 2017). It is worth noting that the choice of subjects is of great importance in the modular system. As a rule, there are not many compulsory subjects, while others depend on the personal choice of students. The Sorbonne University trains teachers in close cooperation with the National Institute of Training and Education of the Académie de Paris. The university organises many special digital projects that aim to improve digital skills not only for students but also for practicing teachers. Particularly, a project to support teachers with e-portfolios called Mahara (Study at Sorbonne University, 2022) is being actively implemented. This project aims to help teachers create an e-portfolio for organising learning through various information and communication technologies: presentations, videos, audio materials, etc. The project is aimed at forming a collective development of digital skills through the prism of synthesising educational and didactic objects that are distributed

and discussed in the learning and research and practice environment. The latter consists of students; teachers, librarians, and psychologists (Study at Sorbonne University, 2022). Such a collective mechanism influences the creation of individual capitalization of skills formed in the electronic presentation portfolio, while emphasising the development of creative skills and identity, which should play a prominent role throughout the career of a modern teacher. A separate direction of this project is the development and further improvement of multimodal writing skills, strengthening research skills through the use of modern media libraries and open access information didactic materials (Martin, 2021). French universities at all leverage technology for research in pedagogy and psychology. Data collection tools, simulation environments, and advanced statistical analysis software enhance the quality and depth of research outcomes.

The emphasis of European education is noticeable in the amount of required scientific literature that the student must study independently. Working with a variety of texts, styles and genres allows you to increase not only your vocabulary, but also your understanding of the structure of language and various ways of expressing thoughts. The emphasis is also on regular writing using a variety of multimodal tools and digital elements. The use of such a simple methodology, according to Martin (2021), allows you to improve the practice of creating texts, make them visual and informative. It is possible to use independent work related to correspondence or other opportunities to form an individual style of communication using digital technologies. These general exercises are widely recognised by specialists and are widely used in European countries (Darrington & Dousay, 2015). At the same time, the possibilities of multimodal writing still need to be further evaluated given the rapid development of digital technologies. Adaptive learning technologies are gaining traction in European higher education. These technologies offer personalized learning pathways tailored to individual students' strengths, weaknesses, and learning preferences. Adaptive systems adjust the pace and content of instruction, ensuring a more customized educational experience. Also, cooperation with innovative technologies have led to increased collaboration between pedagogical and psychological disciplines. Educational psychologists and pedagogical experts collaborate to design evidence-based educational technology and methodologies.

4. Discussion

The analysis of general development trends and specific training programs in European universities has shown that innovative teaching technologies function at the stages of formation, assimilation and implementation. The training of higher education students in pedagogy and psychology will require students to acquire professional and integral competencies (Matei, 2022) - based on all of the above formulas. First of all, it is about content, organisational, functional, and communicative competencies (Bondar et al., 2021). Modern requirements for competitive specialists in the labour market involve changes in the priorities of professional training and a focus on training truly high-category specialists who have a good understanding of educational technologies. The personal components of professional training in the context of the use of innovative technologies in education are an integral part of modern cognitive orientation. The professional formation of future teachers and psychologists will require special attention from teachers, theoretical and practical training.

The problem of further development of innovative educational technologies in the training of specialists in pedagogy and psychology is the uneven implementation of these formulas (Digital education action plan (2021-2027), 2021). While the countries of the European Common Education Area have been implementing educational transformations for a long time (including through transformations in the single Bologna system), other countries on the continent are lagging behind in implementing the necessary transformations. First of all, we are talking about countries that have long been in the “socialist camp” (Wedari, Fatihah, & Rusmanto, 2022). Such trends can be explained by the prolonged use of outdated pedagogical methods and guidelines that were not very acceptable in European society (Namestiuk, 2022). At the same time, outdated mechanisms have the ability to reproduce themselves, which is a rather dangerous trend for the field of training specialists in pedagogy and psychology. The introduction of innovative technologies is possible with the use of effective models of accreditation of educational programs. This will allow higher education institutions to gradually revise the established standards of education towards modernisation and harmonisation with the current requirements of society and European experience. The accreditation tool will enable the further evolution of this area. Another area is to create incentives for the introduction of new European experience in the use of innovative teaching technologies, including taking into account the desire for development and self-development of teachers, and establishing cooperation with employers who are focused on achieving optimal results. Although these recommendations will require additional research, they can demonstrate their effectiveness.

5. Conclusions

Thus, the use of innovative educational technologies has a decisive impact on the formation of specialists in pedagogy and psychology, which can be confirmed by the relevant European experience of teaching in higher education institutions. First of all, the need to acquire integral qualities that combine the necessary skills and knowledge with the independent development of university graduates after graduation is becoming more relevant. Today's popular non-standard types of classes (business games, project-based learning, creative work, etc.), combined with modern information technologies, allow adapting the process of training relevant personnel to modern requirements. At the same time, such transformations entail that academic staff will need additional psychological and pedagogical training, as working with innovative technologies will require the acquisition of additional competencies.

A content analysis of teacher and psychologist training programs at European universities has demonstrated the widespread use of innovative technologies in teaching in these countries. Thus, the main innovative principle of the organisation of training is the competence-based approach, which involves the formation of students' competencies that can facilitate their entry into professional life and ensure speed and adaptability to any changes. Also relevant is the process of training teachers and psychologists in European universities based on a narrow choice of academic disciplines by students in order to ensure the future of professional activity. At the same time, the formulation of a certain list of fundamental formulas for the introduction of innovative educational processes has demonstrated the leadership of the university training system in the EU member states. The countries of the post-socialist camp are lagging behind in this process. Methods of further harmonisation of the pace of development of teacher and psychologist training in higher education institutions across Europe will require additional research.

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