



Adapting curricula to the requirements of the modern digital environment

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■ **Abstract.** The aim of the study was to determine the level of adaptation of curricula to the digital environment, analyse changes, challenges, and achievements related to the introduction of digital technologies, and develop recommendations for the further development of digital education. The results of this study provide recommendations for educational institutions that will facilitate more effective implementation of digital technologies in the educational process, requiring fundamental changes in curricula to improve the quality of education and prepare specialists for the requirements of the modern digital environment. To collect qualitative data, a series of interviews were conducted with students, teachers, and administrators of educational institutions in Lviv, Kyiv, Volyn, and Zhytomyr regions. The interviews were aimed at identifying barriers and opportunities arising from the introduction of digital technologies, as well as effective strategies and approaches to adapting curricula. The results of the interviews showed that most educational institutions are actively implementing digital technologies, using online platforms, interactive whiteboards, virtual laboratories and other digital tools. The main challenges include insufficient technical equipment, unequal access to technology, and the need for continuous professional development of teachers. At the same time, digital technologies help to increase students' interest in learning and improve their results. Adapting curricula to the requirements of the modern digital environment is a prerequisite for ensuring quality education. The use of digital technologies helps to personalise learning, increase student motivation and prepare them for modern challenges. Further development of digital education requires a comprehensive approach that includes technical support, training, and support for teachers and students

■ **Keywords:** integration; educational materials; technology; digitalisation; standards

■ Introduction

In the world of rapid development of information technology and digital technologies, educational institutions face the need to adapt their curricula to the new requirements of the digital society. Digital transformation requires not only the introduction of modern technologies, but also a revision of teaching approaches, curriculum content, assessment methods and teacher training. This is because technology is evolving at a rapid pace, creating a gap between the knowledge students gain during their studies and the skills required in the labour market. Many curricula are based on outdated materials that do not meet the current needs of

the digital economy. And teachers may not have sufficient training to work with modern digital tools and teaching methods.

The main problem is that most educational programmes still focus on outdated teaching methods and do not include the necessary digital skills and competencies. This creates a gap between the requirements of the modern labour market and the training of graduates. It is also important to note that there is an inequality in access to modern digital technologies between urban and rural schools, which further exacerbates this problem. To solve this problem, it is necessary to revise and update

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curricula, provide teachers with the necessary knowledge and skills, and create equal conditions for access to modern technologies for all educational institutions.

A significant number of researchers have studied the adaptation of curricula to the requirements of the modern digital environment. In particular, O. Muliarevych *et al.* (2023) consider digital learning centres to be an essential component of knowledge and the digital learning environment. Scientists believe that the creation of such centres will facilitate the integration of information technology into the educational process and provide students with access to the latest digital resources and platforms.

The adaptation of psychological training programmes to digital technologies contributes to increasing the accessibility of psychological support for different population groups, so the inclusion of digital technologies in modern psychological training programmes allows people to receive psychological support anytime and anywhere through online consultations, mobile applications or web platforms. This will provide an opportunity to learn more, and become more accessible and flexible. Therefore, S. Pihet *et al.* (2024) studied the adaptation of psychoeducation programmes to improve psychological support for caregivers of patients with dementia. Focusing on the medical aspect of their work and how, by adapting the programme, they concentrate on the effectiveness of training and support in different situations, the authors emphasised the importance of individualised approaches and the use of the latest digital tools to ensure high-quality support.

The pandemic has significantly changed approaches to learning, making online education the main teaching method for many educational institutions. O. Pishchukhina *et al.* (2024) focused on the delivery of computer science modules for part-time software students. The researchers analysed how the learning process has changed from the pre-war to the post-pandemic period, focusing on the online learning experience. The study shows that the growing popularity of online learning contributes to greater flexibility and accessibility of educational programmes, especially for those who cannot attend classes in a traditional format. Online education allows students to study at their own pace and place, which is especially important in modern environment.

Modern digital challenges and technologies in the educational environment of higher education institutions are key factors for improving the quality of education. M. Pleskach *et al.* (2020), O. Priadko *et al.* (2022) investigated modern digital challenges and technologies in the educational environment of higher education institutions. They note that the use of the latest technologies, such as virtual reality and artificial intelligence, contributes to improving the effectiveness of learning and student development. The researchers emphasise the need to constantly update educational programmes to meet the modern requirements of the digital world,

which ensures the competitiveness of graduates in the labour market. The professional self-realisation of Ukrainian youth is an integral part of their social and economic development.

Adapting educational programmes to modern labour market conditions and digital challenges is essential for successful integration into professional life. In their research, A. Podolyaka *et al.* (2021), W.S. Mohammad & A.F. Aldakhil (2024) studied the economic, legal and psychological conditions for the professional self-realisation of Ukrainian youth. Focusing on the social aspect, the paper also points out the importance of adapting educational programmes to changing labour market conditions and digital challenges. Ensuring the quality of educational programmes is a key aspect of adapting to the digital environment. The study puts an emphasis on the importance of ensuring the quality of educational programmes through regulatory compliance and support.

Adequate support for teachers and students can significantly increase the effectiveness of educational programmes, which includes providing the necessary resources, professional development for teachers, and creating conditions for effective learning, according to D.M. Quinn & J.S. Kim (2017). Emphasising the importance of artificial intelligence and other modern technologies in modernising the educational process, V.K. Quy *et al.* (2023) also noted that digital transformation contributes to increasing access to education and provides students with the opportunity to acquire knowledge and skills that meet the requirements of the modern labour market.

Adaptation of educational programmes to the needs of displaced children is a critical aspect to ensure their successful learning in a new environment, O. Samoilov *et al.* (2024) explored the psychological and pedagogical aspects of adapting displaced Ukrainian children to a new educational environment. This study shows how important it is to take into account the special needs of students in the process of adapting the educational programme. According to researchers L.M. Sergeieva *et al.* (2022), vocational education also needs to be digitised to improve the efficiency of learning and the training of qualified specialists. Scientists focused on the development of a modern educational environment in the digital space in vocational education and training institutions.

The purpose of the article was to analyse the process of adapting curricula to the needs of modern society in the context of active digitalisation, and to identify challenges and approaches that contribute to improving the quality of education. Objectives of the study are:

- analysis of international experience in implementing digital technologies in the educational process;
- systematising the interview data and identifying the key problems and challenges faced by modern educators in adapting programmes;

- identifying further areas for research and implementing changes to the curriculum.

■ Materials and Methods

The study was conducted using mixed methods to provide an in-depth analysis and a comprehensive understanding of the issues of adapting curricula to the digital environment. The initial stage of the study was a comprehensive review of scientific literature and current research. This included an analysis of academic articles, books, monographs, reports, and research organisations that focus on adapting curricula to the requirements of the modern digital environment. The purpose of the review was to identify the main principles underlying successful adaptation and to identify the main challenges faced by educational institutions. Based on this, the review addressed such aspects as the integration of digital technologies into the educational process, the development of digital competencies among teachers and students, and the impact of digitalisation on the quality of education.

Based on the information gathered, the curricula that have already been adapted to the digital environment are described. This analysis allowed identifying effective practices and tools used in different universities and educational institutions. Particular attention has been paid to both positive examples and cases where difficulties have arisen in the process of adaptation. This helped to get a balanced picture and identify key success factors and risks. To collect qualitative data, a series of interviews were conducted with students, teachers, and administrators of various educational institutions in the Lviv, Kyiv, Volyn, and Zhytomyr regions. The sample included representatives of different levels and types of educational institutions: secondary schools, gymnasiums, lyceums, technical schools, colleges, and universities. The total number of respondents was 100, including:

- 40 students, including students of technical schools and colleges (20 people) and university students (20 people). The students were selected based on their age, speciality, and level of study;
- 30 educators, including teachers and lecturers of various subjects, including humanities, natural sciences and sciences. Their length of service and experience in using digital technologies in education were also taken into account;
- 30 leaders, including school directors, head teachers, deans of faculties, vice-rectors and other administrative staff with experience in managing educational institutions and implementing digital innovations.

The study was conducted in accordance with the Declaration of Helsinki (2013). The participants gave their consent for the experiment. The sample was formed in such a way as to ensure a diversity of opinions and experiences of the respondents, as well as to consider the specifics of different regions and types of

educational institutions. The interviews were conducted in the format of in-depth semi-structured conversations, which allowed for detailed and substantiated answers to questions related to the adaptation of curricula to the requirements of the modern digital environment. The interviews were aimed at identifying barriers and opportunities that arise during the implementation of digital technologies in the educational process, and at identifying effective strategies and approaches that contribute to improving the quality of education and professional training. The main issues discussed were:

1. How do you assess the current level of adaptation of your institution's curricula to the requirements of the modern digital environment?
2. What specific changes have been made to the curriculum in recent years to integrate digital technologies?
3. What are the challenges of implementing digital technologies in the educational process?
4. How do you assess the readiness of teachers to use digital technologies in teaching?
5. What resources and tools are used to improve teachers' digital skills?
6. What digital tools and resources are used in the educational institution?
7. What results or achievements can you point to after the introduction of digital technologies in the curriculum?
8. How do you see the future of digital education, and what steps is your institution taking to be at the forefront of this process?

The collected opinions allowed determining the key challenges they face when adapting curricula. This will help to understand their experience of using new approaches and tools in the learning process, to identify the advantages and disadvantages of these methods from the point of view of end users. It also provided an opportunity to identify practical problems that may not be reflected in the scientific literature and to obtain real-life examples from practice.

■ Results

Adapting curricula to the requirements of the modern digital environment is a relevant and essential issue in the modern world. It not only improves the quality of education, but also ensures that future professionals have the necessary skills to work successfully in the digital world. Firstly, the digital environment is constantly evolving. New technologies, software products, data processing methods and communication tools are emerging. Traditional curricula that do not take these changes into account are quickly becoming outdated. For example, artificial intelligence, machine learning, and big data technologies are already affecting all industries. If students do not acquire knowledge and skills in these areas during their studies, they lose their competitiveness in the labour market.

Secondly, adapting curricula to the digital environment promotes critical thinking and creative problem-solving. Digital tools allow students to work with large amounts of information, analyse data and create new knowledge. This stimulates their ability to think systematically, critically evaluate information and find innovative solutions. For example, using simulation software allows students to model different scenarios and experiment with different approaches to solving problems. Third, adapting to the digital environment increases the interactivity of the learning process. The use of multimedia resources, online courses, virtual laboratories and other digital tools makes learning more engaging and accessible. This is especially important for students, who are growing up in the context of widespread digitalisation. They are used to receiving information quickly and in a format that is convenient for them. Therefore, the integration of digital technologies into the learning process allows better meeting their expectations and needs.

Adaptation of curricula also contributes to the training of specialists who are able to work in the digital economy. The ability to use modern information technology, work in a team, lead projects and communicate in a digital environment are essential skills for a future professional. Such knowledge can only be acquired by adapting curricula to the latest requirements and standards (Jian & Abu Bakar, 2024). With the globalisation of education, students have the opportunity

to choose the best study programmes around the world. Therefore, educational institutions that do not implement digital innovations risk losing their prestige and attractiveness to applicants. Institutions that actively integrate digital technologies into the educational process have a better chance of attracting talented students and providing them with a high-quality education. Digital technologies play a key role in ensuring sustainable development, increasing production efficiency and improving the quality of life. Educational programmes that train specialists capable of implementing and using these technologies make a significant contribution to the development of society. Thus, adapting curricula to the requirements of the modern digital environment is a prerequisite for training competitive specialists, developing critical thinking, increasing the interactivity of the learning process and addressing global challenges. It is an investment in the future that ensures sustainable development of both individuals and society as a whole.

The development of technology and digital tools has a significant impact on the educational process, requiring new approaches to learning and teaching. This includes the integration of the latest technologies into curricula, the development of new teaching and assessment methods, and the improvement of digital literacy of students and teachers. The main aspects of adapting curricula to the requirements of the modern digital environment are highlighted in Table 1.

Table 1. Characteristics of aspects of curriculum adaptation

The adaptation aspect	Description	Example of implementation
Implementation of online resources	Using digital platforms for learning	Use of platforms such as Moodle, Google Classroom
Interactive learning materials	Use of multimedia elements and interactive courses	Video lectures, interactive simulations, online laboratories
Flexible forms of education	Developing programmes with distance and blended learning options	Asynchronous courses, webinars, video conferences
Digital skills of teachers	Professional development of teachers in the field of IT and digital technologies	Digital literacy courses for teachers
Personalisation of training	Individual approach to learning with the use of technology	Adaptive learning platforms, analytics of student performance
Assessment in digital format	Implementation of online testing and assessment tools	Online tests, e-portfolios, assessment systems
Data protection and cybersecurity	Ensuring data security and protection against cyber threats	Use of secure platforms, cybersecurity training
Support and accessibility	Providing access to learning materials for all students	Support for various devices, adaptation for students with special needs

Source: compiled by the author based on J. Cabero-Almenara et al. (2020), O. Sushchenko et al. (2021)

One of the key aspects of adapting curricula to the requirements of the modern digital environment is the introduction of digital technologies into the learning process. This includes the use of computers, tablets, interactive whiteboards, online platforms and software

that enhance learning. For example, distance learning platforms such as Google Classroom, Moodle, or Zoom have become indispensable tools during the pandemic, as educational institutions around the world have switched to distance learning (Table 2).

Table 2. Characteristics of platforms according to the requirements of the digital environment

Platform	Applications in line with the requirements of the digital environment	Ways to improve the usage
Moodle	Organising courses, tests, and forums; integration with other services (Zoom, Google Meet).	Regular updates and tweaks to the platform; improving the skills of teachers in working with the platform.
Google Classroom	Working together on documents; using Google Drive to store materials; use of integrations with other applications (Jamboard, Google Meet).	Extending the platform's capabilities with third-party applications; training teachers and students in the use of all platform functions.
Microsoft Teams	Video conferencing, chat groups, collaboration; integration with Office 365 for easy document management.	Regular trainings for teachers and students; use of analytical tools to assess the effectiveness of training.
Zoom	Conducting webinars and online classes; use the video recording and saving functions.	Improving cybersecurity and educating users on the basics of security; integration with other platforms to improve interaction.
Coursera	Access to courses from the world's leading universities; the possibility of obtaining certificates upon completion of the courses.	Creating local courses for students; use of analytics to increase student engagement.
EdX	Use to access educational resources; interactive courses with practical tasks.	Integration with other educational platforms; feedback from teachers and students to improve the content.
Khan Academy	Use of video tutorials and interactive tasks; personalised training with progress tracking.	Development of additional resources for teachers; Adaptation of content to the requirements of local curricula.
Udemy	A variety of courses on any topic; the ability to create one's own courses with teachers.	Improving the quality of content through feedback; use of the platform for professional development of teachers.

Source: compiled by the author based on O. Shkatula et al. (2023), O. Banit et al. (2023)

Different platforms can be used to meet the requirements of the modern digital environment, and it is important to consider the above steps to improve their use in the educational process. In order to effectively adapt curricula to the digital environment, it is necessary to increase the level of digital literacy among both students and teachers. This includes the ability to use computers, work with various applications and online resources, and cybersecurity knowledge. Educational institutions can organise professional development courses for teachers, as well as include the basics of digital literacy in school curricula.

Digital technologies open up new opportunities for personalising the learning process. Through the use of adaptive curricula and platforms, students can learn at their own pace, receive assignments tailored to their abilities and needs, and have access to additional resources to deepen their knowledge. For example, platforms like Khan Academy offer customised learning plans that allow learners to progress at their own pace. Interactive teaching methods are another crucial aspect of adapting curricula to the modern digital environment. The use of multimedia materials, virtual laboratories, interactive simulations and games helps to engage students in the learning process and increase their motivation. For instance, virtual laboratories allow students to conduct experiments that cannot be performed in real life due to equipment or safety limitations (Gabara et al., 2020). Despite the obvious benefits of digitalising education, there are also challenges. One of them is unequal access to digital technologies. In some regions or among certain social groups, access to computers and the internet may be limited, creating barriers to quality education. Another challenge is the need to constantly update the knowledge and skills of

both teachers and students, which requires additional resources and time.

An important aspect is to prepare teachers to work in a digital environment. This includes not only technical skills, but also methodological training on how to use digital tools in the learning process. Teachers need to be able to integrate digital resources into their lessons, develop interactive tasks, and use distance learning platforms effectively. Adapting curricula to the digital environment requires revising and updating them. This encompasses the inclusion of new subjects and topics related to digital technologies, as well as the adaptation of existing programmes to new requirements. For example, courses on programming, robotics, digital literacy and cybersecurity can be included in the curriculum. STEM education is a critical component of modern curricula. The integration of STEM disciplines allows students to acquire the knowledge and skills necessary to work successfully in the modern technological environment. The use of digital technologies in teaching STEM subjects, such as programming, 3D printing, robotics and virtual reality, contributes to the development of critical thinking and creativity of students.

One of the main advantages of digital learning is its flexibility. Learners can study at a time and place convenient for them, which is especially relevant in cases where traditional learning is not possible due to objective circumstances. In addition, digital technologies make it possible to create more visual and interesting learning materials, which contributes to better knowledge acquisition. Adapting curricula to the requirements of the modern digital environment is a prerequisite for ensuring high-quality and up-to-date education. The introduction of digital technologies, development

of digital literacy, personalisation of learning and interactive teaching methods contribute to improving the educational process and increasing the level of knowledge of students. However, successful adaptation also requires addressing the challenges associated with unequal access to technology and the need to constantly update knowledge and skills. A major part of this process is teacher training and updating curricula to reflect current requirements and trends.

The following answers were received to question 1:

1. One of the teachers interviewed in Kyiv noted that their educational institution had made a significant step forward in digitalisation, and the use of online platforms and interactive materials had become an integral part of the educational process.

2. A student from Lviv believed that they are still on the way to full adaptation, as many teachers actively use digital tools, but there are still those who prefer traditional teaching methods.

To question 2, respondents expressed the following opinions:

1. One of the leaders from Zhytomyr is convinced that many participants in the educational process have already added courses on the basics of digital literacy and programming, as well as introduced the use of virtual laboratories for natural sciences.

2. One of the Volyn teachers interviewed noted that the use of online platforms for homework and testing has become a standard, and he has already started using multimedia presentations and video lessons.

The respondents answered question 3 as follows:

1. One of the Kyiv teachers is convinced that the main challenge is insufficient technical resources, as not all students have access to the necessary devices and stable internet.

2. At the same time, a student from Volyn found that a big problem is that not all teachers have sufficient digital skills, which slows down the process of introducing new technologies.

The following answers were received to question 4:

1. One administrator from Kyiv emphasised that most of their teachers are eager to improve their skills, but the level of training varies, and this is because some have a high level of digital literacy, while others need additional training.

2. One of the teachers in Lviv identified that teachers are ready to use digital technologies, but need regular training and support from the administration.

The respondents provided the following answers to question 5:

1. One of the teachers from Zhytomyr revealed that their institution organises regular seminars and webinars and cooperates with educational platforms such as Prometheus and EdEra.

2. One of the administrators of Volyn noted that they provide access to online courses and trainings, as well as engage experts to conduct masterclasses.

In response to question 6, respondents expressed the following opinions:

1. The Kyiv student emphasised that various distance learning platforms are used, such as Google Classroom, Zoom, as well as specialised software products for studying specific disciplines.

2. One of the Lviv teachers interviewed noted that she actively uses interactive whiteboards, virtual laboratories and software to create multimedia materials.

The respondents provided the following answers to question 7:

1. One of the administrators of Zhytomyr city noted that there is an active growth of students' interest in learning, improvement of their results and growth of digital literacy.

2. One of the Kyiv teachers noted that he sees a significant increase in the efficiency of the learning process, as students have access to more information and can study at their own convenience.

The following opinions were received on the last question:

1. One of the administrators from Volyn noted that he sees the future of education in the full integration of digital technologies, as he plans to expand the use of virtual reality and artificial intelligence in his own educational process.

2. A teacher from Lviv noted that all teachers are actively working on creating digital learning materials and expanding distance learning opportunities, as they strive to ensure equal access to quality education for all students, regardless of their place of residence.

Interviews with educational stakeholders show that the introduction of digital technologies into the curriculum has already had a significant positive impact. However, for further successful development, it is necessary to overcome existing challenges, ensure equal access to digital resources and continuously improve the qualifications of teachers. Only under these conditions is it possible to achieve high-quality education and prepare students for the modern requirements of the labour market.

The introduction of digital technologies into the learning process is an important step in the development of modern education. International experience shows a variety of approaches and strategies that can be useful for improving the Ukrainian education system. In particular, in the United States, digital technologies are actively integrated into the educational process at all levels. One of the leading initiatives is the E-Rate programme, which provides schools with access to broadband internet. Online learning platforms such as Khan Academy and Coursera, which offer free educational resources, play a pivotal role. A critical emphasis is placed on personalised learning, where technology helps to adapt educational content to the individual needs of each student. For example, Finland, which is known for its high quality of education, is actively

introducing digital technologies into the learning process. All schools have access to the Internet and modern equipment. Platforms such as Moodle and Edmodo are used to manage the learning process and communicate between students and teachers. In addition, teachers receive special training to effectively use digital technologies in teaching. Singapore is actively implementing digital technologies in education through the Smart Nation programme. All schools are equipped with interactive whiteboards, tablets, and computers. The Singaporean education system uses online platforms to support distance learning and assess students' knowledge. Special attention is paid to STEM education, where digital tools help students learn complex concepts through interactive simulations and projects. South Korea is one of the leaders in the introduction of digital technologies into the educational process. All schools are provided with high-speed internet and modern equipment. Teachers use e-textbooks, online courses and learning management platforms such as K-MOOCs. The government also supports teacher training programmes for the use of digital technologies in teaching, which helps to improve the efficiency of the educational process. Estonia, known for its digital transformation, is also actively implementing digital technologies in education. All schools have access to the Internet and digital learning materials. An important element is the ProgeTiiger programme, which includes programming and digital literacy training from an early age. Distance learning platforms such as eKool and Moodle are used, providing interactive and personalised learning, as Y. Slutsky *et al.* (2023) noted.

International experience in introducing digital technologies into the educational process demonstrates the importance of a comprehensive approach. Key elements include access to modern equipment and the Internet, teacher training, the use of online platforms for learning management and assessment, and the integration of digital literacy and programming into the curriculum. Ukraine can use these examples to develop its own strategies and initiatives to help improve the quality of education and ensure that students are prepared for modern challenges. Education plays a key role in preparing the younger generation for the challenges they face. For Ukraine, identifying further areas for research and implementing changes to curricula is an indispensable step in ensuring the country's competitiveness and development. Given the rapid development of technology, it is important to continue researching and implementing digital tools in the curriculum. This includes the creation of interactive textbooks, virtual laboratories, online learning platforms and digital libraries. These tools not only make learning more interesting, but also help students develop independent learning and critical thinking skills.

One of the key areas is the development of personalised learning approaches. Research in this area could

focus on creating adaptive curricula that take into account the individual needs and abilities of each student. This will allow for more effective development of each child's potential, reduce the number of students experiencing learning difficulties, and increase overall academic performance. Modern education should focus on developing skills that are essential in the 21st century. This includes critical thinking, creativity, communication skills, teamwork, problem-solving and digital literacy. It is relevant to conduct research to determine the most effective methods of developing these skills and integrate them into the curriculum. STEM education is an integral part of the modern educational process. In Ukraine, there is a need to expand opportunities to study STEM disciplines, starting with primary school. Research in this area could include the development of new teaching materials, the creation of laboratories and technology parks, and teacher training programmes. Ensuring equal opportunities for all students, regardless of their physical or psychological characteristics, is a crucial aspect of modern education. Research in this area could focus on developing methods and materials for inclusive education, adapting curricula, and training teachers to work with children with special needs. Given the global environmental challenges, it is important to integrate environmental education into the curriculum. This includes learning about sustainable development, environmental protection, energy conservation and environmentally friendly technologies. Research in this area can contribute to the development of educational materials and programmes that help students understand the importance of environmental responsibility. Another crucial aspect is preparing students for future careers. This encompasses career guidance programmes, internships, and cooperation with businesses. Research could focus on identifying effective models of interaction between schools and employers to help students better understand their professional interests and opportunities.

Identifying further areas for research and curriculum change in Ukraine includes integrating digital technologies, developing personalised learning, promoting STEM education, ensuring inclusive education, environmental education and career guidance – these are key areas that will help improve the quality of education and prepare students for modern challenges. It is relevant to continue research in these areas and implement best practices to ensure a successful future for Ukraine. Adapting educational programmes to the requirements of the modern digital environment is extremely important for ensuring high-quality education. Modern technologies are developing rapidly, and their integration into the educational process makes learning more accessible, interactive and effective. The introduction of digital tools helps students develop critical thinking, independent learning and problem-solving skills, which are key to a successful career in the modern world. In

addition, the digitalisation of education allows for the creation of personalised curricula that take into account the individual needs and abilities of each student. It also contributes to the development of digital literacy, which is essential for modern life. Therefore, the adaptation of educational projects to digital reality is an integral part of the modernisation of Ukrainian education.

■ Discussion

The results show that the modern world is rapidly changing under the influence of digital technologies, and the adaptation of curricula to the requirements of the digital environment is becoming a key aspect of ensuring the competitiveness of graduates. Changes in education are needed to provide students with the knowledge and skills necessary for a successful career in the new economy. The study showed that traditional disciplines often do not take into account the latest technological advances, making graduates less competitive in the labour market. The Internet and digital platforms allow students and teachers to interact with colleagues around the world. Curricula need to take this global context into account and prepare students for international cooperation and competition. This is supported by the work of many other researchers. For example, according to research by S. Syahrizal *et al.* (2024), M.S. Alsaeed & M.K. Aladil (2024), updating the content of education, including courses in programming, data analysis and information security, is a necessary condition for ensuring the relevance of education. The data confirms that the inclusion of such disciplines in the curricula of technical specialities increases the level of students' training and increases their chances for a successful career.

The analysis of modern curricula has shown that the integration of digital technologies, such as virtual laboratories, simulations and online learning platforms, significantly increases the effectiveness of learning. This is consistent with the views of Y. Slutskiy *et al.* (2023), who noted that the use of modern technologies creates an interactive and inclusive learning environment. And virtual laboratories allow students to conduct experiments in a safe digital environment, which confirms the effectiveness of this approach. As it turned out, hybrid teaching methods that combine traditional lectures with online courses remain successful. This is another important aspect of curriculum adaptation. The results showed that this approach allows students to gain knowledge at a time and pace convenient for them, increases learning efficiency and reduces stress, which coincides with the work of O. Kondur & N. Fuchynska (2021), V.M. Rebenok & A.P. Yushchenko (2022), S. Drossard & A. Hartl (2024). They noted that such training contributes to the development of independence and self-learning skills, which is essential for a successful career in the digital society. It is found that the adaptation of curricula is not only desirable,

but also a necessary condition for preparing students for future professions. The introduction of the latest technologies, updating the content of education and the use of hybrid teaching methods can improve the quality of education and make it more relevant to the requirements of the labour market. However, in order to achieve these goals, significant challenges need to be overcome, including financial support and professional development of teachers.

Despite its many advantages, adapting curricula to the requirements of the digital environment faces several challenges. One of the main ones is the lack of qualified personnel capable of implementing and using the latest technologies in the educational process. The study showed that teacher training is essential for successful adaptation. This is confirmed by the research of N. Morze *et al.* (2019), K. McNelis *et al.* (2022), which points to the need to create professional development programmes for each teacher to master the latest technologies and teaching methods. Another challenge is financial constraints. The introduction of modern technologies requires significant investment, which can be problematic for many educational institutions, especially in countries with limited budgets. Therefore, it is crucial to constantly seek new sources of funding, including through partnerships with private companies and international organisations. Such hypotheses were confirmed by the results of the study, which coincide with the findings of N. Morze *et al.* (2023), J. Cao *et al.* (2024).

Successful curriculum adaptation requires a strategic approach that includes several key elements. The study showed that regular monitoring of the latest technological and market trends allows educational institutions to respond quickly to changes and update curricula in accordance with current requirements. This is supported by the findings of S. Karpluk (2019), B. Muckenhofer *et al.* (2023), who pointed out the importance of analysing market trends for adapting curricula. Also, the organisation of professional development courses for teachers to master the latest technologies and teaching methods is a key element of successful adaptation, as K. Dyrfjor *et al.* (2023) noted. The creation and implementation of modern learning materials that take into account the specifics of the digital environment is an important aspect of curriculum adaptation. The study results show that e-textbooks, interactive tasks and video lectures provide a variety of learning modes. Partnerships with companies working in the field of IT and digital technologies are successful, as noted by researchers N. Kravtsova *et al.* (2022), S. Alkhayyal & S. Bajaba (2024), who argued that this allows educational institutions to obtain up-to-date information on labour market needs and adapt curricula to meet them. The data confirms that such cooperation creates opportunities for student internships and the involvement of practitioners in the educational process. This is consistent with the findings of this study.

Regular evaluation of the effectiveness of study programmes to improve them is a key element of successful adaptation. The results indicate the importance of student feedback and analysis of graduates' performance in the labour market. This is supported by the study by L.A. Kolesnichenko *et al.* (2021), who emphasised the importance of regular programme evaluation and improvement. The results of this study show that the introduction of digital technologies in the educational process significantly increases student engagement and their readiness to work in the modern digital environment. After all, digital technologies make it possible to adapt curricula to the individual needs of students, providing a more efficient and relevant educational process. The findings of the researcher E. Balashov (2023) confirm the data on the importance of using innovative technologies. Other studies, including the work of K. Kolesnik *et al.* (2023), O. Borzenko *et al.* (2024), indicate that in a rapidly changing digital environment, professional and personal learning is becoming a continuous process. Adapted curricula help students develop independent learning skills and readiness for change.

Adapting curricula to the requirements of the modern digital environment is an integral part of the development of the education system. This study, as well as the research of other scholars, confirms that the introduction of the latest technologies, updating the content of education and the use of hybrid teaching methods helps to improve the quality of education and prepare students for a successful career in the digital economy. However, to achieve this goal, several challenges need to be overcome, including the provision of qualified staff and sufficient funding. A strategic approach, including monitoring trends, professional development of teachers, cooperation with industry and regular performance evaluation, is key to successfully adapting curricula to the modern digital environment. Education must be a dynamic and flexible system that can respond quickly to changes in technology and the labour market, equipping students with the knowledge and skills they need for a successful future. It is important for educational institutions to actively innovate, develop partnerships with industry and invest in the professional development of their teachers.

An analysis of the research findings in the context of other scholars' work shows that there is a consensus on the need to integrate digital technologies and adapt curricula. This confirms the importance of a strategic approach to changes in the educational process, including monitoring trends, collaboration with industry, and regular performance evaluation. Education must be ready to respond quickly to changes in technology and labour market demands. This is the only way to provide students with the knowledge and skills that will allow them to successfully integrate into the modern digital environment and achieve professional success.

■ Conclusions

The adaptation of curricula to the requirements of the modern digital environment is a pressing issue that is becoming increasingly significant in the context of modern education. The interviews with students, teachers, and administrators of educational institutions in Lviv, Kyiv, Volyn and Zhytomyr regions allowed gaining valuable insights and identifying the main areas for further action. The majority of students, teachers, and managers surveyed have a positive attitude towards the introduction of digital technologies in the educational process. They noted that digital tools help to increase student engagement, make learning more interactive and accessible. It is important to continue to maintain and develop this positive attitude through training of teaching staff and provision of necessary resources.

One of the main challenges identified by respondents is the lack of technical support for educational institutions. Insufficient number of computers, outdated equipment, and unstable internet access are becoming obstacles to the effective integration of digital technologies. It is recommended to increase investment in the technical support of schools and universities, as well as to ensure stable access to high-speed Internet. Teachers noted the need for additional training to effectively use digital tools in teaching. Many of them do not have sufficient skills and knowledge to work with the latest technologies. Professional development programmes and trainings for teachers should be developed to help them master new methods and tools. The students emphasised the importance of a personalised approach to learning, which is made possible by digital technologies. They noted that individualised curricula help them to learn better and develop their own skills. Educational institutions should work to create adaptive curricula that take into account the individual needs and interests of students. The interviews showed that there is a need to increase the level of digital literacy among students and pupils. It is critical to include digital literacy courses in the curriculum from an early age, which will allow students to acquire the necessary skills to use digital tools effectively in their studies and everyday life.

The heads of educational institutions noted the importance of supporting innovative initiatives and projects in the field of education. They pointed out the need to create conditions for the development of start-ups and innovative programmes that contribute to the digital transformation of education. It is recommended to introduce grant programmes and competitions to support innovative ideas. An important aspect is to create a system of feedback and evaluation of the effectiveness of digital technologies. Teachers, students, and administrators should participate in regular surveys and questionnaires to identify problems and find solutions. Adapting curricula to the requirements of the modern digital environment requires a comprehensive approach and coordinated work of all participants in the

educational process. The interviews indicate the need for technical support, training of teaching staff, development of digital literacy and support for innovation. It is essential to take into account the opinions and needs of students, teachers, and administrators to create an effective and modern educational system in Ukraine.

A limitation of the study was that the interviews covered only four regions of Ukraine: Lviv, Kyiv, Volyn and Zhytomyr. This limits the possibility of generalising the results to the whole country, as the conditions

and level of development of educational technologies may differ significantly in other regions of Ukraine. For a more comprehensive analysis, other regions, such as the eastern and southern regions, should be included.

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■ Conflict of Interest

None.

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Адаптація навчальних програм до вимог сучасного цифрового середовища

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■ **Анотація.** Метою дослідження було визначення рівня адаптації навчальних програм до цифрового середовища, аналіз змін, викликів та досягнень, пов'язаних з впровадженням цифрових технологій, а також розробка рекомендацій щодо подальшого розвитку цифрової освіти. У результатах даного дослідження розроблено рекомендації для освітніх установ, які сприятимуть більш ефективному впровадженню цифрових технологій у навчальний процес, що вимагають кардинальних змін у навчальних програмах для підвищення якості освіти та підготовки фахівців до вимог сучасного цифрового середовища. Для збору якісних даних було проведено серію інтерв'ю зі студентами, викладачами та адміністраторами освітніх закладів Львівської, Київської, Волинської та Житомирської областей. Інтерв'ю були спрямовані на виявлення бар'єрів та можливостей, що виникають під час впровадження цифрових технологій, а також ефективних стратегій та підходів до адаптації навчальних програм. Результати інтерв'ю показали, що більшість закладів освіти активно впроваджують цифрові технології, використовуючи онлайн-платформи, інтерактивні дошки, віртуальні лабораторії та інші цифрові інструменти. Основні виклики включають недостатню технічну оснащеність, нерівний доступ до технологій та необхідність постійного підвищення кваліфікації викладачів. Водночас цифрові технології сприяють підвищенню зацікавленості студентів у навчанні та покращенню результатів. Адаптація навчальних програм до вимог сучасного цифрового середовища є необхідною умовою для забезпечення якісної освіти. Використання цифрових технологій сприяє персоналізації навчання, підвищенню мотивації студентів та підготовці їх до сучасних викликів. Подальший розвиток цифрової освіти вимагає комплексного підходу, що включає технічне забезпечення, навчання та підтримку викладачів та студентів

■ **Ключові слова:** інтеграція; освітні матеріали; технології; цифровізація; стандарти