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## Role of Modern Information Technologies in Professional Training of Philology Teachers (Kazakhstani Experience)

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**Abstract.** The article considers the role of information technologies in educational activities, their influence on the formation of professional competences of future teachers. The analysis of scientific publications and empirical research determined that the use of digital tools significantly improves the quality of training, promotes the creation of interactive materials and expands opportunities for independent learning. Special attention is paid to the introduction of innovative technologies, such as artificial intelligence and automated systems, which opens new avenues for the educational process.

The state programme “Digital Kazakhstan” (2018–2024) focuses on the development of human potential in educational sphere, which is manifested through the introduction of modern curricula in universities, including areas such as artificial intelligence, data analysis and cloud technologies. This makes it possible to train professionals in demand on the labour market. The increasing number of grants for IT education inspires young people to choose promising specialities, while the development of online platforms makes high quality education accessible even to those living in remote parts of the country. Digital technologies are becoming an integral part of the educational process: the use of digital libraries, interactive whiteboards and virtual laboratories makes learning more exciting and effective. To create equal opportunities, the Internet infrastructure is being actively developed, providing schools with access to the network and introducing distance education platforms, which is especially important in the context of pandemics and other constraints. Digitalisation of the management of educational institutions simplifies interaction between students, parents and teachers: electronic diaries, journals and progress monitoring systems make the process more transparent and manageable (State Programme “Digital Kazakhstan”).

Positive changes of the IT use in the training of future teachers have been identified, but there remain challenges related to insufficient training and infrastructural limitations. Based on the findings, recommendations for further development of digital technologies in teacher training are proposed, which will improve its quality and compliance with modern requirements.

**Keywords:** information technologies, professional competences, competences, future teachers, digital Kazakhstan, IT, artificial intelligence, digital literacy.

Research area: Theory and History of Culture, Art (Cultural Studies). Education.

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## Роль современных информационных технологий в профессиональной подготовке учителей-филологов (казахстанский опыт)

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**Аннотация.** В статье рассматривается роль информационных технологий в образовательной деятельности, их влияние на формирование профессиональных компетенций будущих учителей. Проведённый анализ научных публикаций и эмпирическое исследование позволили определить, что использование цифровых инструментов значительно улучшает качество подготовки, способствует созданию интерактивных материалов и расширяет возможности для самостоятельного обучения. Особое внимание уделяется внедрению инновационных технологий, таких как искусственный интеллект и автоматизированные системы, что открывает новые перспективы для образовательного процесса.

В государственной программе «Цифровой Казахстан» (2018–2024) акцентируется внимание на развитии человеческого потенциала в образовании, который проявляется через введение современных учебных программ в университетах, включая направления, такие как искусственный интеллект, анализ данных и облачные технологии. Это позволяет готовить профессионалов, востребованных на рынке труда. Увеличение числа грантов на обучение в сфере информационных технологий вдохновляет молодежь на выбор перспективных специальностей, а развитие онлайн-платформ делает качественное образование доступным даже для жителей отдаленных уголков страны. Цифровые технологии становятся неотъемлемой частью учебного процесса: использование электронных библиотек, интерактивных досок и виртуальных лабораторий делает обучение более увлекательным и результативным. Для создания равных возможностей активно развивается интернет-инфраструктура, обеспечивая школы доступом к Сети и внедряя дистанционные образовательные платформы, что особенно важно в условиях пандемий и других ограничений. Цифровизация управления образовательными учреждениями упрощает взаимодействие между учениками, родителями и педагогами: электронные дневники, журналы и системы контроля успеваемости делают процесс более прозрачным и управляемым (Государственная программа «Цифровой Казахстан»).

Выявлены положительные изменения в применении ИТ в обучении будущих учителей, однако остаются вызовы, связанные с недостаточной подготовкой

и инфраструктурными ограничениями. На основании полученных данных предложены рекомендации по дальнейшему развитию цифровых технологий в педагогической подготовке, что позволит повысить её качество и соответствие современным требованиям.

**Ключевые слова:** информационные технологии, профессиональные компетенции, компетенции, будущие учителя, цифровой Казахстан, ИТ, искусственный интеллект, цифровая грамотность.

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## Introduction

Modernisation of education and global digitalisation requires the future teacher to be able to use digital or information technologies. Pervasiveness of distance learning and application of artificial intelligence makes it necessary for a modern teacher to develop or acquire information competences.

The message of the head of state Kasym-Jomart Tokayev “Fair Kazakhstan: law and order, economic growth, social optimism” emphasises that teachers are the intellectual vanguard of the country, laying the foundation for the long-term progress of the nation. The importance of providing the economy with qualified personnel, especially through the training of talented and motivated young people in pedagogical universities, is highlighted as one of the priority tasks (Tokayev, 2024).

In this context, the use of information technologies in educational practice becomes a key element of training future teachers of philology. Modern technologies allow educators not only to improve the learning process, but also to form competences necessary in the rapidly changing digital society. The integration of information technologies contributes to the creation of conditions for training future teachers who will be able to become leaders in the educational environment, meeting the demands of the time and the requirements of the state.

The purpose of this article is to analyse the impact of information technologies on the

formation of professional competences of future teachers of philology, as well as to identify the opportunities and problems of their use in educational activities.

## Theoretical Framework

Information technologies (IT) have become one of the most important tools of education modernisation, providing qualitative transformation of the educational process. In modern conditions they fulfil several key functions, influencing pedagogical creativity, formation of communicative competence and development of professional skills of future teachers.

The use of IT promotes the creativity of teachers, offering a wide range of tools for producing interactive and adaptive educational resources. Multimedia presentations help to visualise complex concepts, interactive tasks on platforms enhance student engagement, whereas educational content creation software provides opportunities to integrate text, images and video into a single coherent learning material. IT also enables teachers to develop innovative approaches to teaching, fostering their professional self-realisation and creative solutions.

Communicative competence is one of the key components of a teacher’s professional training. The use of IT in the educational process supports effective interaction between teachers and students through online platforms and messengers, the formation of skills to work

in digital environments, which is important for the development of interpersonal and professional relations, as well as the organisation of distance learning, which requires the IT application for the creation and transfer of materials, knowledge control and feedback. The work of O. V. Iakovleva and E. P. Shmakova has shown that ICT (information and communication technologies) contribute to the development of skills of dialogue building between students and teachers, effective use of terminology and communicative strategies in educational activities (Iakovleva, 2007; Shmakova, 2013).

The use of IT enhances all aspects of educational activities. Digital libraries and databases allow students and teachers to quickly find the necessary materials; video lessons, virtual laboratories and simulations help to better understand complex concepts and theories; tests and assignments on digital platforms automate knowledge testing, providing instant feedback. The use of information and education environment (IEE), as noted in the studies of B. U. Dzholdasbekova, K. N. Zhapparkulova, and O. Aleksandrova, improves students' learning and promotes independent work (Dzholdasbekova et al., 2019).

E. K. Nauryzbaeva conducted the research related to foresight technologies, which involve the use of IT tools for the development of digital culture and professional training of humanitarian specialists, including philologists. These studies emphasise the importance of training future teachers to apply information technologies in educational activities.

The pedagogical universities of Kazakhstan play an important role in training future teachers of philology using modern information technologies: Abay Kazakh National Pedagogical University advocates for active use of LMS Moodle for teaching philological disciplines, L. N. Gumilev Eurasian National University is supportive of IT research for student training, Kazakh National Pedagogical University named after Al-Farabi holds courses and educational programmes on information technologies, which are comprehensively used in the training of specialists at various levels: online course "Information and Communication Technologies", the purpose of which is to

train specialists (future teachers of philology) who would be able to apply modern technologies in the professional activities using digital technologies, and which integrates modern IT solutions in the process of teaching languages. Thus, IT plays an important role in safeguarding accessibility of education for all categories of students, including students with special educational needs. Digital technologies ensure the development of individual educational trajectories, adjusting the content and pace of learning to the needs of learners. As regards inclusive educational technology, the use of voice-activated programmes or adaptive interfaces help students with disabilities to become active participants in the educational process.

Modern society requires educators not only to have special knowledge, but also to be able to use IT to adapt to changing conditions. This implies mastering new technologies such as artificial intelligence, virtual and augmented reality, using online platforms for professional development of teachers, flexibility and adaptability in teaching and learning approaches.

### **Problem Statement**

The education system in the modern world is facing the challenges posed by rapid digitalisation and the need to train teachers to work in a dynamically developing information society. The integration of digital technologies into the educational process becomes not only a prerequisite of improving the quality of training of future teachers, but also an important element in the formation of their key professional skills. However, in practice, the level of use of these technologies is significantly inferior to their potential.

The main difficulty is the insufficient readiness of teachers and students to effectively apply information technologies in their activities. This is due to their low level of digital literacy, lack of targeted training in the use of modern IT tools, and limited access to resources for professional development. In addition, the technical infrastructure of educational institutions often does not meet the standards required to implement advanced solutions such as artificial intelligence systems, virtual reality and automation of learning processes.

Another problem is the disconnected implementation of digital technologies. As a result, the formation of a full-fledged educational environment based on information resources remains at a low level. Teachers and students rarely use adaptive and interactive approaches, besides they insufficiently use such resources as digital libraries, learning management platforms and automated knowledge testing systems.

Thus, the educational system faces the task of training teachers who will be able to use digital technologies as a means of improving the effectiveness of learning. For this purpose, it is necessary to implement a set of following measures: improve educational programmes, upgrade technical infrastructure, and organise specialised courses and seminars. Only such an approach will allow teachers to meet the challenges of the time and effectively use technologies to solve professional tasks.

### Methods

The research was aimed at the analysis of scientific publications, synthesis of teaching and methodological ideas, also empirical research was used, i.e. questionnaire survey of future teachers and teachers of philology, generalisation of teaching experience, interpretation of the obtained data.

The results of the experiment conducted in 2019 at the Kazakh National University named after Al-Farabi Dzhholdasbekova confirmed the effectiveness of the new methodology developed on the basis of information and educational environment. 350 students were surveyed (Dzhholdasbekova et al., 2019).

In 2022 in the Kazakh National Women's Pedagogical University, scientists

Zh.B. Akhmetova, V.I. Zhumagulova, G.A. Orynkhanova (2022) conducted the next study based on the survey of 95 participants. Their work is directed to the use of digital technologies (hereinafter – DT) in the professional training of future teachers of Russian language and literature. The authors highlight the significance of digital educational resources (hereinafter – DER) in the educational process and their influence on the formation of key professional competences. 20 % of students constantly use DER, 72 % use them rarely, and 8 % do not use them at all. The main types of work with DER include searching for information (92 %), creating texts (90 %), presentations (77 %) and reading electronic materials (68 %). However, 76 % of respondents reported inadequate readiness to use DT in their professional activities, indicating the need for more in-depth training in this area (Akhmetova et al., 2022).

In 2024, the authors conducted a study of the assistance of information technologies in the formation of professional competences at the Kazakh National University, as well as in schools of Almaty. A questionnaire survey of students of philology, future teachers (more than 120 students), and school teachers of philology (more than 100) was conducted.

Philology teachers had to answer the following questions:

1. Do you often use information technologies in teaching? (yes; no; difficult to answer)
2. Do you think that the use of IT facilitates preparation for lessons and allows you to diversify them? (yes; no; difficult to answer)
3. What IT tools do you use? (text editors, specialised software (e-textbooks, learn-

Table 1. Data from the 2019 questionnaire survey

Indicator	Results
Positive perception of the methodology	69 %
Improved learning through IEE	84 %
Facilitated learning	80 %
Ability to learn the material independently	71 %
Clarity and accessibility of the methodology	81,3 %
Discomfort with the voice-over text	12 %

ing systems, knowledge control systems), internet (search engines, etc.), audio-video)

4. Would you like to receive additional knowledge to improve your IT competence? (yes; no; I have sufficient level of knowledge; no, I don't see the need; difficult to answer)

5. What IT innovations do you think would be useful in training? (artificial intelligence for teacher training – virtual simulations to train teachers in new methods and technologies, programmes to manage the learning process (e.g. tracking students' progress and lesson planning), programmes for automated assignment checking, speech and text recognition systems to facilitate interaction (for students with special needs)).

The questionnaire of future teachers contained the following questions:

1. What IT tools do you use when studying professional disciplines? (search engines (Google, Yandex), software for creation of presentations (PowerPoint), audio-video materials, electronic libraries, reference books).

2. What role, in your opinion, does IT play in teacher preparation for lessons? (it can simplify the preparation process, improve the quality of teaching, help to create interactive materials).

3. What IT tools or technologies would you like to master for your work in the future? (artificial intelligence and chatbots for teaching, software for automating knowledge testing, programmes for creating educational content (animations, videos)).

## Results

Having studied the scientific works of I. A. Zimnyaya and A. V. Khutorskoy, we understand competences as an integration of an individual's inner potential (according to Zimnyaya) and external social requirements (according to Khutorskoy). These approaches stress the dual nature of competences: on the one hand, they reflect personal development and internal capabilities and, on the other hand, compliance with the requirements of society and the educational process (Zimnyaya, Mazaeva, Lapteva; Khutorskoy).

Kazakhstan scientist N. D. Khmel connects professional competence of a teacher

with his/her main activity – holistic pedagogical process. She points out that the training of a specialist includes three main aspects: content, personal and procedural-technological (Begaliyeva).

Information technologies can be used in several forms by modern teachers. These can be fulfilling the requirements of educational institutions or ministries, working with ready-made tools based on given algorithms, as well as methods of creative approach: creating their own software products, developing new methods of their application or adapting existing solutions for specific tasks.

The use of information technologies contributes to the optimisation of the educational process, making the interaction between teacher and students more effective. E. V. Shirshov's research identifies the following didactic functions of information technologies:

- visibility, which ensures awareness and comprehension of perceived educational information, formation of ideas and concepts;

- informativeness, as learning tools are direct sources of knowledge, i.e. carriers of certain information;

- compensatory function, facilitating the learning process, contributing to the achievement of the goal with the least expenditure of effort and time;

- adaptability, oriented towards maintaining favourable conditions for the learning process, organising demonstrations, independent work, etc.;

- integrativeness, giving way to consider an object or phenomenon as a part and as a whole (Shirshov, Undozyorova).

Information technologies have a great didactic potential, which gives various opportunities to the teacher in the educational process. IT in I. V. Robert's research has the following functions:

- possibility to implement interactive dialogue, which is characterized by immediate feedback between the user and IT tools (each user request causes a response action of the system and, vice versa, a system reply requires a user response);

- computer visualisation of educational information about the studied object, process



or phenomenon (visual representation on the screen of the object, its components or their models; the display of the process or its model, including those hidden in the real world; graphic or other visualised interpretation of the studied object or the regularity of the studied process);

- computer modelling of studied or researched objects, their relations, phenomena, processes, running both in real and “virtual” modes (representation on the screen of a mathematical, informationally descriptive, visual model adequate to the original);

- archiving, storage of large volumes of information with the possibility of easy access to it, its transfer, replication;

- automation of computational, information retrieval processes, operations on collection, processing, transfer, display, replication of information, archival storage of sufficiently large amounts of information, as well as processing the results of a teaching experiment (both real and virtual), its screen visualisation with the possibility of multiple repetition of a fragment or the experiment itself;

- automation of the processes of information and methodological support, organisational management of learning activities and control of learning results (Robert).

These functions enable teachers of philology to manage the learning process and thoroughly prepare for the teaching process.

It is possible to define readiness to use information technologies in the pedagogical pro-

cess as a complex systemic personal education of a teacher, combining the focus on solving pedagogical tasks with the use of information technologies, as well as abilities and skills necessary for their pragmatic use in educational activities.

The results of the questionnaire survey of teachers-philologists and students are shown below: teachers-philologists (Fig. 1, 2, 3 and 4), students (Fig. 5, 6, 7).

### Discussion

Information technologies (IT) play a significant role in the educational environment, and the results of the survey among teachers of philology and students confirm their importance in the development of professional competences. The majority of respondents actively use IT, considering it useful for simplifying lesson preparation, improving the quality of teaching and creating interactive materials. In particular, 66 per cent of teachers said that the use of technology makes lesson preparation easier, 61 per cent admitted it improves the quality of teaching, and another 66 per cent emphasised the ability to create more engaging and up-to-date teaching materials.

The survey revealed that the most popular tools among teachers are word processing tools and online resources, used by 82 per cent of those surveyed. Learning management software proved popular with 44.3 per cent of participants, while automated assignment checking systems were supported by 54.4 per cent.

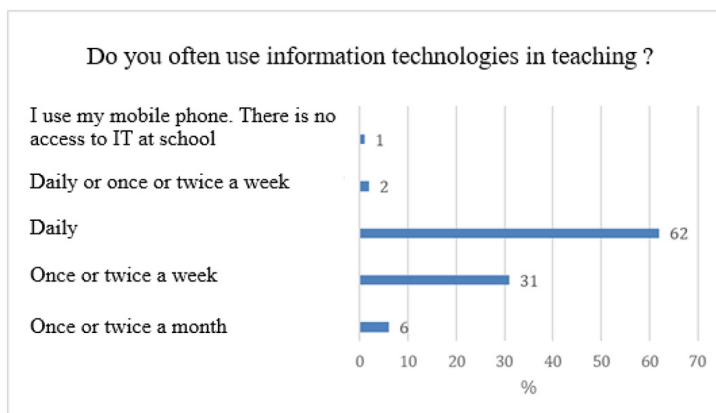


Fig. 1. Frequency of IT use

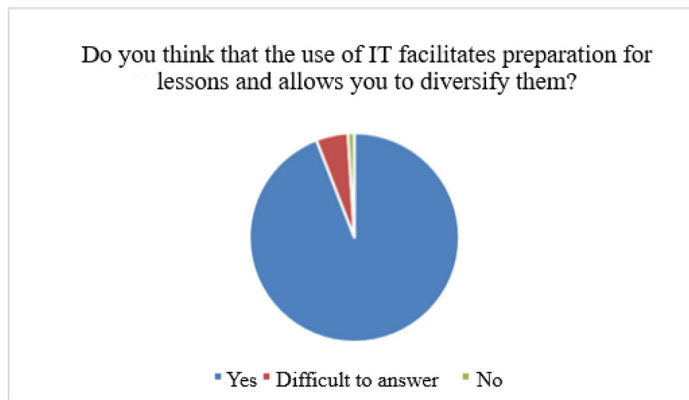


Fig. 2. Use of IT in preparation for classes

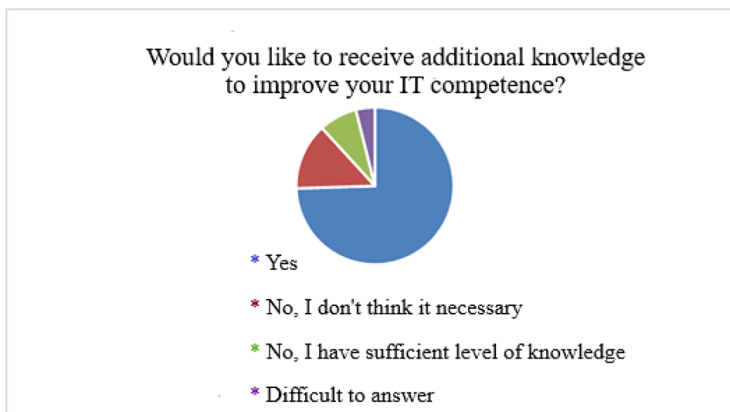


Fig. 3. Knowledge to improve IT competence

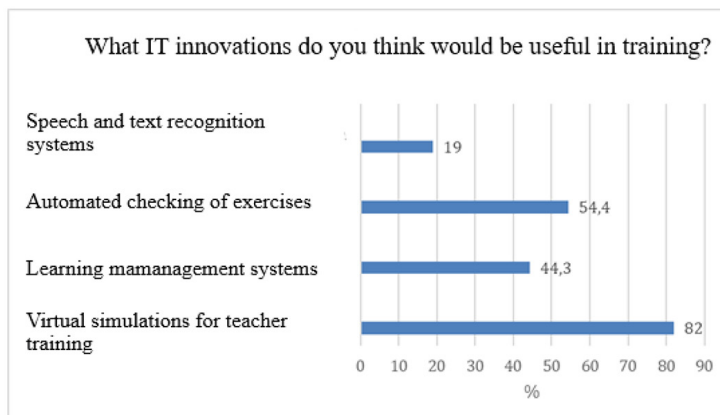


Fig. 4. Useful IT innovations in education  
Results of future teachers' questionnaire survey (Fig. 5, 6, 7)



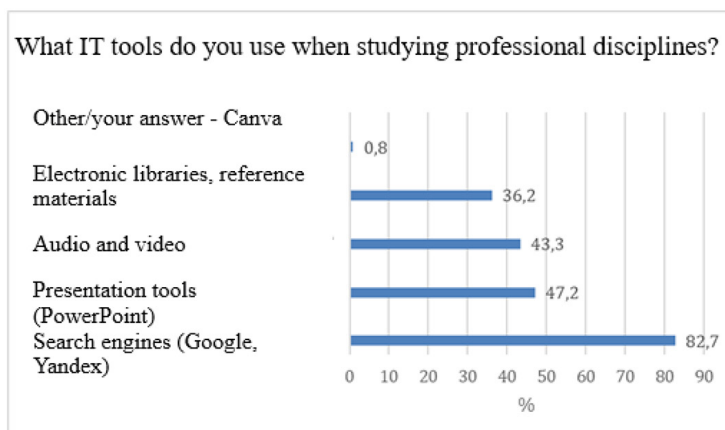


Fig. 5. IT means used for studying professional disciplines

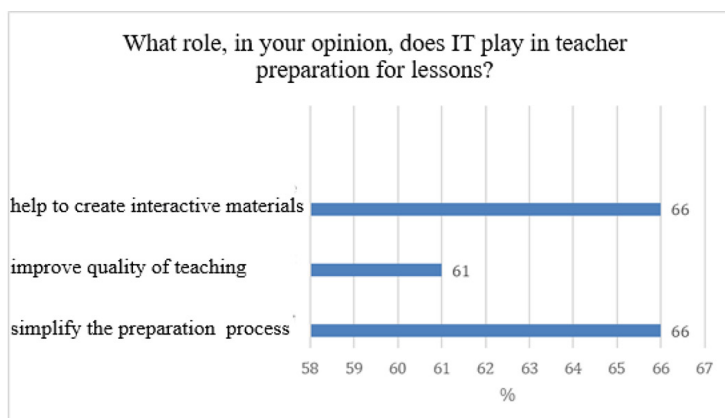


Fig. 6. The role of IT in lesson preparation

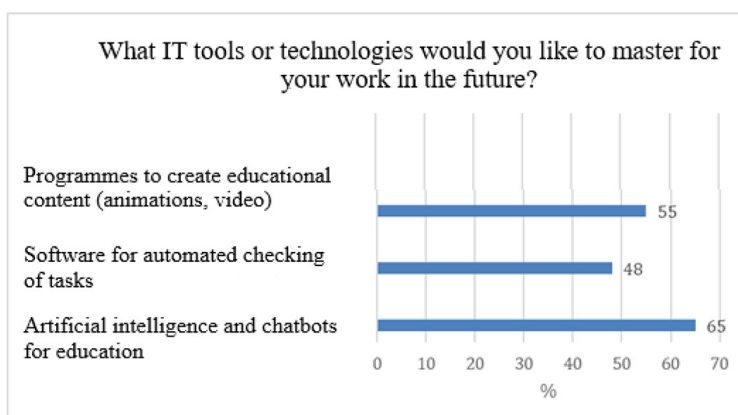


Fig. 7. IT tools

These data show that IT not only optimises routine tasks, but also contributes to the professional development of teachers.

Search engines are the most popular among students of philology, they are frequently used by 82.7 % of respondents. In the second place there are programmes for creating presentations (47.2 %), while audio and video materials are used by 43.3 %. At the same time, only 36.2 % of students use electronic libraries and reference books, which indicates the need to promote these resources for the formation of more comprehensive professional skills. Respondents' interest in innovative technologies deserves special attention. For instance, 65 % expressed a desire to learn about tools based on artificial intelligence, including chatbots for training. In addition, 48 % of respondents are interested in programmes for automating knowledge testing, and 55 % consider tools for creating multimedia educational content, such as animations and videos, to be utmost important.

Based on these data, it can be concluded that information technologies are becoming an integral part of teacher training. They simplify routine processes, diversify teaching methods and significantly increase students' involvement in the educational process. The high interest of both teachers and students in the use of modern technologies underlines their promising potential. It is important to further develop the use of IT in teaching by holding specialised training sessions and master classes, as well as integrating digital solutions into educational programmes. This will enable future educators to successfully cope with professional challenges in the context of digitalisation of education.

In 2022, the study by Zh.B. Akhmetova, V.I. Zhumagulova, G.A. Orynkhanova revealed the problem of low readiness of teachers and students to use digital technologies.

The study 2024 revealed a wider use of IT by teachers (for example, 82 % keenly use text editors and Internet resources), which indicates some progress.

Comparing the data demonstrates an important change. While earlier studies testified to a low level of IT readiness among educators

and students, the current study documents an increase in basic technology use and a growing interest in innovative tools.

### Conclusion

Modern information technologies have a sustainable impact on the process of training future teachers of philology in Kazakhstan. Thanks to the state programme "Digital Kazakhstan" and relentless efforts of educational institutions: Kazakh National Pedagogical University named after Al-Farabi and Abay Kazakh National Pedagogical University, innovative conditions for training future teachers of philology are being currently created in the country. Systematic introduction of digital tools into the learning process, including the use of online platforms and educational resources, contributes not only to the improvement of quality education, but also to the formation of key digital competences in future teachers of philology.

Kazakhstan scientists such as: S.B. Begaliyeva, E.K. Nauryzbayeva, B. Dzholdasbekova incessantly research effective ways of integrating information technologies into educational practice. This experience of technology integration is relevant in the multilingual and multicultural environment of Kazakhstan.

Modern information technologies are purported to be essential in the formation of professional competences of future teachers of philology by aiding preparing for classes, improving the quality of teaching and creating interactive teaching materials.

The results of the study confirm that the use of IT helps to form professional competences of teachers that meet the requirements of modern education. Special attention is paid to the introduction of innovative tools and technologies, such as artificial intelligence, which opens up new opportunities for boosting the efficiency of the educational process.

Despite the progress achieved, certain challenges remain related to the training of teachers how to work with IT, as well as the development of material and technical infrastructure. Successful technology integration requires a comprehensive approach that includes systematic training and support for educators,

as well as creating the necessary conditions for their work, developing new educational platforms, and supporting scientists and educators in their pursuit of innovation.

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