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Professional development of teachers in the context of digital transformation

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Abstract. The purpose of this article was to explore the issues related to the development of teachers' digital skills in the context of digital transformation, as well as the application of innovative technologies and their integration into the modern educational environment. In the course of the research, digital education, strategies for enhancing teachers' digital competence, and key factors influencing professional development were analysed. The article examined the role of digital educational technologies in the learning process and addressed the challenges related to improving teachers' digital competencies. The integration of digital technologies was aimed at increasing the effectiveness and accessibility of education. In the course of the study, the process of digitalisation of the education system of the Kyrgyz Republic, its main directions, and the results achieved were analysed. Three levels of teachers' technological competence were examined: basic digital literacy, the ability to organise technological and professional activities, and information literacy. As part of the research, an experiment was conducted with the participation of university instructors and students. The experimental groups used digital education platforms (such as Google Classroom, Moodle, Zoom, etc.) and interactive teaching methods, including video lessons, online testing, and digital simulations. A comparison of the results of the pre- and post-tests made it possible to analyse the changes in students' levels of knowledge. The results of the experiment demonstrated that knowledge acquisition indicators in the group using digital technologies increased by 25-30%. In addition, improvements were observed in students' analytical thinking, critical reasoning, and independent learning skills. Enhancing teachers' digital literacy also had a significant impact on the effectiveness of the educational process. The conducted study confirmed the positive influence of digital educational technologies on the professional development of both students and educators. However, certain issues remained unresolved, such as insufficient infrastructure, digital inequality, and challenges in teacher training. To ensure the effective use of digital technologies, it is essential to provide systematic training for teachers and improve the technical equipment of educational institutions

Keywords: digital education; teachers' competence; innovative technologies; online teaching; digital literacy; interactive methods; professional development

■ INTRODUCTION

The professional development of teachers in the context of digital transformation has become a crucial component of the modern educational process. The widespread use of digital technologies in the field of education requires teachers to acquire new skills, effectively utilise digital

educational resources, and develop innovative teaching methods. To fully harness the potential of digital educational resources, teachers' professional development must be continuous and systematic (Ismailova Navazi, 2025). Digital technologies are fundamentally transforming the

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education system. Under the conditions of digital transformation, the role of teachers differs significantly from that in the traditional education model, creating a need for the application of innovative approaches in the learning process (Tsymbal, 2020). Teachers must not only be able to use digital tools effectively but also possess appropriate skills in information security, online teaching methods, and the organisation of interactive lessons. Therefore, the effective integration of digital educational resources and the enhancement of teachers' professional training are essential factors for improving the quality of the education system (Serditova & Belotserkovsky, 2020).

Digital transformation requires the continuous improvement of teachers' professional development. The effective use of digital educational resources contributes to enhancing the quality of education and improving teachers' professional competence. To successfully implement this transformation, it is essential to combine digital technologies with traditional teaching methods, provide training in new educational approaches, and develop support measures for educators. Teachers must possess appropriate skills in working with new digital tools, applying innovative methods in the educational process, organising online learning, and ensuring information security. Enhancing the knowledge and professional expertise of educators is crucial to fully utilising the potential of digital educational resources. The relevance of digital transformation in the field of education, to a significant extent, requires a renewed role and function of teachers. Since 2020, improving the digital preparedness of teaching staff and integrating digital tools into educational processes has become one of the key global challenges. For example, V. Kolykhatov (2018) examined how digital educational tools are applied in pedagogical activities and how they influence academic success in the classroom. The study highlighted that the integration of digital tools contributed to improving the quality of education. The findings also demonstrated that teachers' interest in and readiness to use digital educational resources had a direct impact on their professional development.

A. Kurbatskiy & Yu. Vorotnitskiy (2017) emphasised the growing need for strong personal data protection and the implementation of new information security standards in digital pedagogy. Their research identified the necessity of enhancing teachers' knowledge in the field of digital security and highlighted the importance of paying special attention to this aspect. Similarly, T. Sobchenko (2021) offered recommendations for further improving the professional development of educators using digital learning platforms. He emphasised the need for comprehensive training and workshops to enhance the competencies of teachers who work with digital tools. Digital transformation is reshaping the educational environment; however, successful implementation of this process requires the adoption of innovations in education and the enhancement of teachers' digital skills. For instance, improving the digital proficiency of teaching staff and advancing online teaching methods can lead to better quality in the educational process. In this

regard, a study conducted by I. Zakharova (2010) demonstrated the necessity of balancing both technical and pedagogical training to increase teachers' digital competence.

The purpose of the study was to identify the main directions of teachers' professional development in the context of digital transformation and to explore effective ways of using digital educational resources. The objectives of the study were: to examine the theoretical foundations of teachers' professional development under digital transformation conditions; to identify the main challenges in the use of digital educational resources and ways to address them; to develop practical recommendations for enhancing teachers' digital competence; to analyse mechanisms for improving the quality of education through the use of digital technologies; to propose measures for the development of digital education environments in higher education institutions and schools.

LITERATURE REVIEW

Digital transformation has become one of the key directions in teachers' professional development. In his work, O. Diachuk (2024) stated that the widespread use of digital technologies in the educational environment requires teachers to acquire new skills and pedagogical methods. In the Kyrgyz Republic, the effective use of digital educational resources is considered one of the essential conditions for improving teachers' qualifications, renewing the learning process, and enhancing the quality of education (Zakharov & Korostelev, 2021). In response to this process, educators must pay special attention to their professional development and strive to successfully integrate digital technologies into teaching practices (Mozhayeva, 2017). Currently, digitalisation in Kyrgyzstan has been implemented at all levels of education, facilitating increased accessibility to technical, vocational, and higher education (Kochin *et al.*, 2020). One of the primary goals of higher education is to train competent and professional specialists capable of working effectively in a digital environment. Under these conditions, it is necessary to develop both theoretical and practical approaches to the use of information and communication technologies (ICT) to support students' professional development. Additionally, involving students in scientific research activities, fostering cognitive interest, and implementing modern models of pedagogical education remain key directions in the learning process (UNESCO, n.d.).

The use of digital educational resources significantly expands the possibilities of the learning process and facilitates increased access to knowledge. Digital technologies have become an integral part of education systems in many countries around the world. They ensure the availability of learning materials and create conditions for effective and convenient teaching. Effective utilisation of digital educational resources requires teachers to possess appropriate qualifications and students to have the necessary knowledge and skills. One of the main advantages of such resources is the ability to create personalised learning paths and curricula for each student. Interactive textbooks,

online courses, and other digital resources enable the adaptation of the learning process to students' individual characteristics. As a result, students achieve deeper knowledge acquisition, while teachers are able to work more effectively with their learners. Additionally, the accessibility and diversity of digital educational resources are among their important advantages. Modern technologies support a variety of formats, from textual materials to graphics, video, and audio content. This allows students to learn information in the manner most suitable for them and makes the learning process more convenient (Kolykhmatov, 2018). The digital economy occupies a central place in the professional development of future teachers, as it imposes new requirements on the education system and transforms the forms and content of pedagogical activities. The formation of the digital society is characterised by three main trends: the digital economy, digital technologies, and the digital generation. These factors introduce new approaches to the educational process and necessitate adapting teaching to modern conditions. Digital technologies fundamentally change the educational environment, stimulating the renewal of traditional teaching methods and concepts (Li, 2021). They enable the creation of new teaching models aimed at fostering skills in independent research, data analysis, and development. Consequently, the effective and systematic integration of digital technologies in the modern education system is considered one of the key directions. Digital transformation in the education sector not only opens up new opportunities but also imposes significant demands on the professional development of teachers (Zaitsev, 2020). The widespread use of digital technologies in the educational process necessitates the renewal of teaching methods and pedagogical skills. Only educators who can adapt to the digital environment and effectively utilise modern technologies are able to organise students' learning efficiently (Kolykhmatov, 2020). Therefore, enhancing teachers' digital literacy and developing their competencies in information and communication technologies constitute key tasks of the modern education system.

The study of digital technologies and the analysis of their impact on human activity have been extensively conducted by scholars. The term "digital technologies" emerged in the second half of the 20th century and began to be actively integrated into the educational process. Digital technologies encompass graphical and animated information, interactive structures, as well as various educational tools. Among European researchers studying digital technologies are scholars such as M. Bond *et al.* (2021), who emphasised the importance of digital technologies in education and proposed ways to integrate them into the learning process. For example, C. Redecker & Y. Punie (2017) highlighted the advantages of using digital technologies as teaching tools and supportive elements in the educational process. They stressed that digital technologies facilitate student motivation and enhance collaboration between teachers and students, as well as among students themselves. Russian scholars have also been studying the role of digital

technologies in education. For example, S. Titova (2022) considers digital technologies as an effective tool for intensifying the educational process and preparing individuals for life in the information society. She identified several didactic functions of using digital technologies. These functions are aimed at increasing students' mastery of knowledge, organising information efficiently, and adapting the teaching process to individual characteristics. According to S. Titova (2022), the use of digital technologies in education performs several important didactic functions: it optimises the handling of educational information – enhancing the capabilities for rapid search, access, transmission, storage, collaborative processing, printing, classification, and structuring of information; it increases the informativeness of teaching by expanding the availability and diversity of information during the learning process; it facilitates students' independent learning and effective organisation of educational activities; it provides opportunities for autonomous search, research, analysis, and interpretation of information, thereby supporting the development of analytical and scientific research skills; it enables the creation of personalised learning strategies tailored to each student's individual characteristics; and it fosters conditions for analysing student achievements, conducting reflection, self-assessment, and peer assessment. Kyrgyz scholars have also been studying the role of digital technologies in education and contributing to their effective implementation. For example, the Educational and Methodological Department of Digital Technologies at the Kyrgyz-Russian Slavic University (KRSU) conducts activities related to the development of electronic education systems, the introduction of innovative technologies, and the training of faculty members. Additionally, the Jusup Balasagyn Kyrgyz National University (KNU) has been implementing various initiatives aimed at integrating digital technologies into the educational process. These studies and activities confirm the significant role of digital technologies in education and demonstrate that their effective use contributes to improving the quality of education.

■ MATERIALS AND METHODS

The study was conducted from February to April 2024. The primary objective of the experiment was to determine the impact of using digital resources in teaching pedagogical subjects on students' academic performance, learning motivation, and critical thinking skills. Additionally, by comparing the effectiveness of traditional teaching methods with digital learning, the role and potential of digital technologies in the educational process were thoroughly examined. The experiment involved 80 university students. Within the study, students were divided into two groups for the "Pedagogy" course: a digital group (40 students) and a traditional group (40 students). The instruction in the experimental digital group was conducted using digital educational resources. Students were provided with video materials, electronic presentations, and interactive platforms (such as Google Classroom and Kahoot) to complete

tests and assignments. Infographics and animated diagrams were also used to visualise information. At the end of the learning process, a test was administered, and the results of both groups were compared.

The experimental second group received instruction based on traditional teaching methods. This group was taught through lectures, textbooks, and printed materials. The teaching process primarily focused on the teacher's explanations and students' completion of written assignments. Throughout the experiment, informed consent was obtained from all participants, and the study was conducted fully in accordance with the Guidance Note of the European Commission on Ethics and Data Protection (2021). Students were informed in advance that their data would be kept confidential and used solely for scientific purposes. Data collection methods included testing, interviews, and observation. The purpose of the testing was to assess students' analytical thinking, information search and analysis, and creative problem-solving skills. Tests were administered in two stages, and the results of the digital and traditional teaching groups were compared.

Within the framework of the study, interviews were conducted with students and teachers. The interviews were organised in a semi-structured format using a set of pre-determined key questions. Each interview was conducted individually, allowing participants to share their experiences with using digital resources, as well as their opinions on the advantages and challenges of digital learning. Open-ended questions were asked during the interviews, providing participants the opportunity to express their thoughts freely and in detail. The responses were recorded and subsequently subjected to content analysis.

■ RESULTS AND DISCUSSION

Enhancing teacher competencies in digital education

Modern education requires teachers who effectively use digital technologies. To enable students to work confidently in a digital environment, teachers must master the following skills. Effective information search and utilisation involve the ability to efficiently locate, analyse, and apply relevant information within the learning process (Tregubova, 2020). Developing skills to work with digital tools – including interactive whiteboards, educational platforms, videoconferencing services, and other digital devices – is also essential (Li, 2021). To organise both open and extra-curricular lessons effectively, it is recommended to use webinars, online courses, and open educational resources (Redecker & Punie, 2017). Developing students' independent learning skills is equally important; this includes teaching students proper use of digital technologies and supporting their scientific research activities. By developing these skills, teachers can increase student engagement in the digital learning environment and create a modern education model (Imanaliev, 2023). These functions not only enhance the effectiveness of education but also assist teachers in planning the learning process and developing teaching strategies that take into account students' individual

characteristics (Sulaimanova *et al.*, 2021). Therefore, improving teachers' qualifications in information and communication technologies (ICT) and implementing continuous professional development strategies are essential for the effective use of digital technologies. The use of digital technologies increases student motivation and ensures active participation in the learning process. Modern digital resources enable the application of interactive and innovative methods in education, encouraging students to engage in independent research and deepen their knowledge (Turalbayeva *et al.*, 2021).

V. Kolykhatov (2018) identified four key principles related to the use of digital technologies in the educational process, which facilitate effective organisation of teaching and achievement of educational goals. The first principle is the hierarchical principle, which implies that the teacher must play a leading role in the learning process. The teacher manages the system, provides individual support to students, and regulates non-standard situations. The importance of the teacher's leadership function is especially emphasised in conditions where digital technologies are used. The second principle is the feedback principle, which allows students to evaluate the results of their activities and make improvements as needed. This principle highlights the importance of active communication between students and teachers through digital technologies, while feedback contributes to improving the quality of the learning process and promotes students' independent work (Kolykhatov, 2018). The third principle is the adaptive principle, which states that the educational process should be tailored to the individual characteristics of students. Digital technologies offer customised learning materials for students of various levels and learning styles, allowing them to learn at their own pace (Tregubova, 2020). The fourth principle is the integrative principle, which emphasises that digital technologies must be deeply and effectively integrated into the teaching process. This principle ensures the content and methodological alignment of digital tools with the lesson, meaning that technologies should support the achievement of educational goals (Sulaimanova *et al.*, 2021).

The use of digital technologies in education and the evolving role of the teacher merit careful examination. In the context of digital education, a teacher's technological competence is viewed at three main levels. At the first level, the teacher must possess basic digital literacy. This includes skills to create, process, copy, and transmit information in an electronic environment, as well as the ability to effectively use presentation technologies during the learning process. Additionally, the teacher should have developed the ability to search for and analyse necessary information using internet resources, including AI-based systems such as ChatGPT. At the next level, the teacher is expected to be ready to use digital technologies as tools to organise educational activities. At this level, the teacher can evaluate the quality and interactivity of subject-related internet resources, effectively deliver learning materials using software applications, and select and appropriately

use the most suitable educational platforms. The level of information literacy emphasises the teacher's abilities to perceive, retain, and process information. Additionally, this level focuses on developing skills for the full and purposeful use of digital technologies' capabilities. In recent

years, the Kyrgyz Republic has been actively implementing reforms aimed at digitalising the education system. This process aims to improve the quality of education, expand accessibility, and integrate modern technologies. The main directions of digitalisation are presented in Table 1.

Table 1. Main directions of digitalisation

No.	Directions	Content
1	Electronic educational platforms	The expansion of online platforms such as "Digital School" and "Bilim Bulagy" has become a widespread practice in the education sector. Moreover, digital textbooks and electronic resources play a crucial role in revitalising and enhancing the educational process.
2	Online learning and distance education	Following the COVID-19 pandemic, online learning formats have been actively implemented and widely adopted in universities and schools. Specifically, platforms such as Moodle, Zoom, and Google Classroom enable the effective organisation of remote teaching and learning processes.
3	Development of STEM education and programming	Educational programs focused on coding, robotics, and other STEM fields are being integrated into the education system. At the same time, IT education centres have been established, offering specialised courses in programming.
4	Provision of schools and higher education institutions with digital infrastructure	To create the necessary conditions for digital education, schools and higher education institutions are being equipped with computer hardware and stable internet connectivity. Additionally, electronic grade books and digital assessment systems have been implemented, leading to the automation of the educational process.
5	Artificial intelligence and innovations in education	The role of artificial intelligence in education is increasingly growing. Personalised learning, adaptive, and interactive learning platforms have been developed, enabling the optimisation of the educational process tailored to the student's level.

Source: compiled by the authors

The process of digitalisation of education in the Kyrgyz Republic is aimed at making learning more accessible, efficient, and modern. Reforms in this direction not only enhance the quality of education but also create conditions for mastering new technologies. However, challenges such as insufficient infrastructure, the need to improve teachers' IT competencies, and digital inequality remain critical issues that require resolution. Digital educational resources and their impact on the learning process warrant thorough analysis. Among digital educational resources, electronic and interactive textbooks, digital platforms, online courses, webinars, and other innovative formats occupy a special place. These resources assist students in mastering various pedagogical disciplines and expand their opportunities for independent learning. The renewed education system is designed to meet the demands of the modern digital economy, focusing on developing deep information analysis, creative thinking, and functional literacy. The primary goal of modernising secondary education is to improve students' functional literacy, develop cognitive abilities, foster critical thinking, and create conditions for mastering soft skills (Turalbayeva *et al.*, 2019).

Since 2017, the majority of general education institutions have transitioned to an updated educational content, a process integrated with modern technologies that has contributed to improving the quality of education. The new content includes updating educational programs, implementing a criterion-based assessment system, enhancing teachers' pedagogical skills, and delivering instruction in a digital environment. Active learning methods play a crucial role in developing students' intellectual potential. These methods aim to promote active knowledge acquisition, strengthen functional literacy, facilitate effective peer communication, foster creative problem-solving, and

develop critical thinking skills. The use of modern technologies in the learning process stimulates students' independent thinking and creates conditions for deep and conscious knowledge assimilation. The updated educational content is designed not only to teach practical skills but also to expand students' analytical abilities and opportunities for creative inquiry. As a result, the education system is being renewed in accordance with the demands of the digital age, contributing to the enhancement of society's intellectual and innovative potential.

One of the primary responsibilities of teachers is to instill human values and moral qualities in students, teach them to respect other cultures and viewpoints, as well as to nurture conscious and healthy children. Teachers play a key role in implementing the updated educational content; therefore, enhancing the professional development of educators remains a top priority. Professional development encompasses the specialised knowledge, skills, work experience, and behavioural norms that enable teachers to achieve success in their work. With the advancement of digital technologies and educational resources, developing and improving teachers' digital competencies has become an essential part of the modern educational process. One of the main advantages of digital educational resources is their accessibility, allowing learning to take place anytime and anywhere. This, in turn, fosters students' independent learning skills and prepares them for their future professional activities. Digital educational resources enable the customisation of the learning process according to the individual needs of each student, allowing for personalised education. They also contribute to broadening the worldview of future teachers and enhancing their level of information literacy. Interactive textbooks and online courses help students deepen their understanding of subjects, providing

opportunities to gain additional knowledge and practical skills. This, in turn, increases their competence and confidence not only in their professional activities but also in interactions with colleagues and employers. However, digital educational resources cannot fully replace traditional teaching methods such as lectures, seminars, and practical classes. Taking into account both their potential and limitations, it is important to combine digital and traditional teaching methods to achieve maximum results in the educational process. Proper integration of digital educational technologies into the learning process enhances teachers' professional competence and contributes to improving students' academic performance. The use of digital educational resources plays a significant role in developing future teachers' cognitive autonomy. This supports their effective engagement in the learning process and helps cultivate valuable skills for their professional careers. However, ensuring the quality of education requires a balanced integration of both digital and traditional teaching approaches.

Professional training is an educational system aimed at the accelerated development of necessary skills for mastering a specific profession. Digital technologies are transforming the educational process, significantly updating the role and content of the teacher's work. A modern teacher must systematically update courses, lectures, and practical classes according to new theoretical concepts, technologies, and empirical data (Kolykhmatov, 2018). It is also important to continuously analyse scientific and educational literature, electronic resources, and databases to provide the learning process with high-quality information. In the modern education system, the teacher acts not only as a knowledge provider but also as a guide directing students towards acquiring knowledge. The teacher trains students to effectively use information databases, assists in completing practical tasks, discussing case studies, and evaluating their achievements. Moreover, modern teachers must be able to select and effectively use technologies tailored to the content and objectives of their subjects, taking into account the individual characteristics of students to promote their harmonious development. Preparing qualified personnel is one of the key factors in improving the quality of education. Currently, developing teachers' skills in

the effective use of digital educational resources is among the main challenges. In response to this need, starting from the 2021-2022 academic year, the Isamidinov Pedagogical Personnel Targeted Training Institute introduced an elective course titled "Digital Technologies in Education" for students specialising in Pedagogy. This course has been incorporated into the curricula of all pedagogical specialties at the institute and is aimed at training future teachers to effectively utilise digital technologies.

In conclusion, digital educational resources facilitate the development of new teaching methods and contribute to improving the quality of education. In the modern education system, enhancing teachers' digital competencies and developing their skills for effective use of technologies significantly contribute to raising students' knowledge levels and intellectual potential. The impact and efficiency of digital education technologies are central to the discipline "Digital Technologies in Education", whose main goal is to advance students' professional and specialised competencies in the field of digital technologies. This course is focused on the use of modern digital resources such as ChatGPT, Padlet, Prezi, Canva, Wordwall, LearningApps, Quizzes, Kahoot, Mindmeister, and others. These tools play a significant role in developing students' skills in independently searching for and designing educational materials. Through practical exercises, students consolidate their theoretical knowledge and enhance their digital competencies by solving real-world problems (Kolykhmatov, 2020). Therefore, to effectively utilise digital technologies, it is essential to enhance educators' ICT qualifications and implement continuous professional development strategies.

Research outcomes and survey results

The use of digital educational technologies makes students' learning more effective and engaging. According to the survey results, 85.3% of students indicated that the use of digital resources and technologies facilitates learning and promotes deeper understanding. These technologies increase motivation for learning and expand cognitive autonomy. Figure 1 illustrates the survey results, reflecting the impact of digital resources on knowledge acquisition and motivation, as well as the level of technical difficulties encountered.

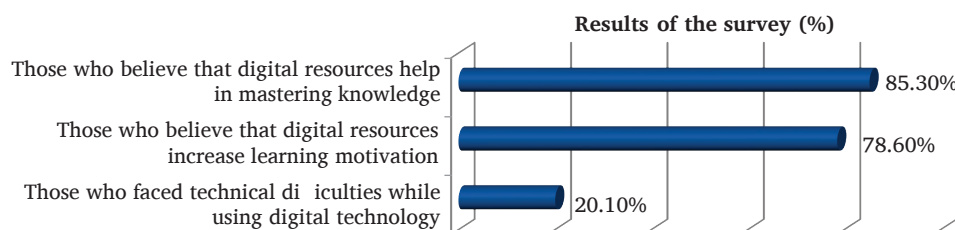


Figure 1. Survey results (assessment of learning effectiveness)

Source: compiled by the authors

Experimental Group 1 (40 students). In this group, the teacher conducted lessons using digital technologies and resources. The instructor actively utilised digital tools

during lectures and practical classes. The learning process was supported by video materials and interactive assignments, which increased students' engagement and made

the lessons more interesting. Digital resources also played an important role in assigning homework. For example, students created interactive tasks on the LearningApps platform, including quizzes, sorting, grouping, classification, crosswords, and video preparation assignments. The purpose of the test was to evaluate students' skills in information search and analysis, decision-making, and creative problem-solving. The test was conducted in two stages: in the first stage, students using traditional educational resources were assessed, and in the second stage, the results of students using digital educational resources were evaluated. Equal conditions and identical tasks were provided to students at each stage. The test results showed that students who used digital technologies demonstrated higher analytical and independent thinking skills. The study concluded that digital resources positively influence the learning process and contribute to the development of critical thinking skills. As a result, 82.1% of the students successfully passed the test. This result was 10.8% higher compared to the outcome of Group 2. The use of digital tools and resources increased students' interest in learning, making the educational process more engaging and effective.

Experimental Group 2 (40 students). The teacher conducted lessons using traditional teaching methods combined with interactive techniques and tasks. Each

lesson included practical assignments with interactive elements such as filling conceptual and semantic tables, question-and-answer methods, arranging answers in a specified order, multiple-choice selection, collaborative work, problem-solving situations, brainstorming, creating mind maps, project development, and others. These assignments activated the students' learning process and increased their engagement with the lessons. Additionally, the interactive elements encouraged students' independent work and creative thinking, which positively influenced their successful performance in high-stakes assessments. 72.3% of students successfully passed the test, while 27.7% demonstrated unsatisfactory results. Students in this group primarily used reproductive methods and glossary-based assignments for learning. Additionally, the abundance of material and insufficient preparation time created challenges for the students. A comparative analysis of the test results is presented in Table 2. These results indicate that the use of digital resources in learning methods was effective and contributed to increased motivation to study. The application of digital tools enhanced students' engagement and helped deepen their knowledge. The experiment's outcome underscores the necessity of extensive integration of digital technologies in the teaching process.

Table 2. Analysis of academic achievement

Group	Students passed successfully
Experimental Group 1 (using digital resources)	83.1%
Experimental Group 2 (traditional teaching method)	72.3%

Source: compiled by the authors

Based on the analysis, it was determined that digital resources made the learning process more effective and engaging, increasing students' interest and activity in the lessons. During the interviews, educators emphasised the necessity of technological and methodological readiness

for the successful implementation of digital teaching. These results confirmed that professional development of teachers holds special significance in the context of digital education. The results of the interviews are presented in Table 3.

Table 3. Opinions of students and teachers (interview results)

Opinion	Percentage of students
Digital resources help to visualise and clarify information	80%
Digital learning increases interest in the lesson	75%
Experienced difficulties using digital technologies	25%
Teachers' opinions (interview results)	Percentage of teachers
Digital resources increase the effectiveness of lessons	90%
Student active participation increases	85%
Preparing methodological materials for digital learning requires time	60%

Source: compiled by the authors

Conclusion based on the interview results: the use of digital resources was found to make the learning process significantly more effective and engaging. There was a noticeable increase in students' interest and activity during lessons. At the same time, it became evident that the successful implementation of digital learning requires teachers to have adequate technological and methodological

preparedness. In other words, professional development of teachers is a key factor in the context of digital education.

Overall results of the experiment. The use of digital resources in teaching pedagogical subjects has a positive impact on students' knowledge acquisition and motivation. The data obtained during the study revealed several important findings. Firstly, a clear improvement in the quality

of education was observed. Students using digital resources demonstrated significantly higher academic achievements compared to those taught by traditional methods. Specifically, in the experimental group (digital learning applied), 83.1% of students successfully passed the test, whereas only 72.3% of students in the traditional teaching group achieved successful results. This confirms that digital learning methods contribute substantially to a deeper mastery of knowledge. Secondly, an increase in students' interest in the learning process was noted. The majority of students (80%) noted that digital resources help visualise learning materials, making comprehension easier and the learning process more engaging. Additionally, 75% of students reported that digital teaching significantly increased their interest in the lessons. These factors demonstrate the direct positive impact of digital technologies on student motivation. Thirdly, the opinions of both students and teachers were studied. Among teachers, 90% emphasised that digital resources enhance the effectiveness of lessons, while 85% observed increased student active participation through digital learning. At the same time, 60% of teachers pointed out that preparing methodological materials for digital teaching requires considerable time and effort.

During the experiment, certain difficulties and obstacles were also identified. Twenty-five percent of teachers reported encountering challenges in using digital technologies. This situation underscores the necessity of continuous development of teachers' technological and methodological preparedness to successfully implement digital teaching. In conclusion, the results of the study confirmed that the use of digital educational resources positively impacts students' academic achievements and motivation to learn. However, to ensure the effectiveness of digital teaching, it is crucial to continuously improve teachers' professional training, particularly their technological and methodological skills. Such measures will enable the full utilisation of the opportunities provided by digital education and will contribute to raising the quality of the educational process to a new level.

In summary, under conditions of digital transformation, the professional development of educators is advancing along several key directions. First, teachers are focused on effectively utilising digital educational resources, gaining a deep understanding of their capabilities, and integrating these resources into their pedagogical activities (HSE, 2018). Second, there is an increasing need to master and continuously improve digital skills related to information search, analysis, and storage (Rostelecom, 2018). Third, educators are paying special attention to developing interactive teaching methods and implementing them through modern digital platforms. Furthermore, teachers' competencies are expanding in creating, structuring, and adapting learning materials to the educational process using digital technologies. Finally, according to E. du Plooy *et al.* (2024), finding a balance between digital and traditional teaching methods and creating a personalised learning environment that considers each student's individual needs have become important areas of professional development

for teachers. Digital technologies enable educators to make the learning process dynamic, interactive, and effective. They expand the accessibility of educational resources and facilitate the individualisation of instruction. Additionally, digital educational platforms assist teachers in monitoring student achievements, improving teaching methods, and enhancing the efficiency of lessons (Korol, 2014).

However, when using digital technologies, educators should not forget the importance of traditional teaching methods. Some complex topics require discussion, debates, and the development of practical skills, for which traditional pedagogical approaches remain relevant. Therefore, maintaining a balance between digital and traditional teaching methods is essential (Alenezi *et al.*, 2023). Although digital technologies and artificial intelligence have significantly impacted the educational process, the teacher's role remains irreplaceable. In traditional education, the teacher primarily serves as the main source of information, whereas in the current digital era, their role has shifted to that of a coordinator, guide, and motivator of the learning process. Teachers must not only transmit information but also teach students critical thinking, independent research, and the effective use of digital resources. They should integrate digital technologies appropriately into the teaching process and support the development of students' autonomous learning skills (Haleem *et al.*, 2022). As noted by S. Saleem *et al.* (2025), although artificial intelligence (AI) can personalise learning materials and automate the teaching process, it cannot perform essential functions such as establishing direct communication with students, providing emotional support, and fostering creative thinking. Teachers build personal relationships with students, understand their learning difficulties, and motivate them. AI serves as a tool to optimise the educational process but cannot fully replace the teacher's experience, pedagogical intuition, and creative approach. Therefore, by leveraging digital opportunities, teachers can ensure that the educational process is of high quality, dynamic, and effective. Proper and purposeful use of digital technologies helps improve educators' professional skills and elevate the quality of education to a new level. In summary, digital development is a contemporary necessity for educators. The digital transformation in education requires teachers to master new technologies and successfully integrate them into the teaching process. Digital competence enables teachers to conduct engaging and effective lessons, apply various teaching methods, and enhance students' academic achievements.

■ CONCLUSIONS

The research underscored the pivotal role of digital education technologies in the learning process and the enhancement of teachers' digital competence. The primary objective was to demonstrate how the integration of digital technologies could bolster the effectiveness and accessibility of education. A key finding of the experiment, which involved both university teachers and students, revealed

a notable improvement in knowledge retention among experimental groups utilising digital platforms (such as Google Classroom, Moodle, and Zoom) and interactive teaching methods (including video lessons, online testing, and digital simulations). Specifically, these groups showed a 25-30% increase in knowledge acquisition. Furthermore, the study observed a significant development in students' analytical thinking, critical approach, and self-directed learning abilities. Enhancing teachers' digital literacy also profoundly impacted the overall effectiveness of the educational process. The research confirmed the positive influence of digital educational technologies on the professional development of both students and educators alike. The study also highlighted three levels of technological competence essential for teachers: basic digital literacy, the ability to organise technological and professional activities, and information literacy. Moreover, the integration of digital technologies in education should adhere to four key principles: hierarchical, feedback, adaptive, and integrative, ensuring the teacher's guiding role, student self-assessment, individualised learning, and seamless technological fit within educational goals.

Despite these positive outcomes, the study identified several persistent challenges, including infrastructure deficiencies, digital inequality, and difficulties in providing comprehensive teacher training. These issues pose

significant barriers to the full realisation of digital education's potential. Therefore, for the effective and widespread adoption of digital technologies in education, systematic and continuous training for teachers is indispensable. Concurrently, substantial improvements in the technical support and infrastructure of educational institutions are paramount. Future research should focus on developing targeted strategies and models to overcome the identified infrastructure and digital inequality challenges, particularly in underserved regions. Further studies could also explore the long-term impacts of digital transformation on educational outcomes and delve into the efficacy of specific digital tools and pedagogical approaches in diverse educational settings. Additionally, research on sustainable professional development programs for educators, tailored to evolving digital landscapes, would be highly beneficial.

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Санариптик трансформация шарттарында педагогдордун кесиптик өнүгүүсү

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Аннотация. Бул макаланын максаты – санариптик трансформация шартында педагогикалык кадрлардын санариптик көндүмдөрүн өнүктүрүү маселелерин изилдөө жана инновациялык технологияларды колдонуу жана аларды заманбап билим берүү чөйрөсүнө интеграциялоо. Изилдөөнүн жүрүшүндө санариптик билим берүү, педагогдордун санариптик компетенттүүлүгүн жогорулатуу боюнча стратегиялар жана кесиптик өсүүнүн негизги факторлору талданган. Макалада санариптик билим берүү технологияларынын окуу процессиндеги ролу жана мугалимдердин санариптик компетенттүүлүгүн өнүктүрүү маселелери каралган. Санариптик технологияларды интеграциялоо билим берүүнүн эффективдүүлүгүн жана жеткиликтүүлүгүн жогорулатууга багытталган. Изилдөөнүн жүрүшүндө Кыргыз Республикасынын билим берүү системасын санариптештирүү процесси, анын негизги багыттары жана алынган натыйжалар талданган. Педагогдордун технологиялык компетенттүүлүгүнүн үч деңгээли каралган: негизги санариптик сабаттуулук, технологиялык жана профессионалдык ишмердүүлүктү уюштуруу, маалыматтык сабаттуулук. Изилдөөнүн алкагында жогорку окуу жайларынын окутуучулары жана студенттери катышкан эксперимент жүргүзүлдү. Эксперименттик топтор санариптик билим берүү платформаларын (Google Classroom, Moodle, Zoom ж.б.) жана интерактивдүү окутуу ыкмаларын (видеоуроктор, онлайн тестирлөө, санариптик симуляциялар) колдонушту. Кириш жана жыйынтык тесттеринин натыйжаларын салыштыруу студенттердин билим деңгээлинде болгон өзгөрүүлөрдү талдоого мүмкүндүк берди. Эксперименттин натыйжалары санариптик технологияларды колдонгон топто билимдерди өздөштүрүү көрсөткүчтөрү 25-30% га жогорулаганын көрсөттү. Мындан тышкары, студенттердин аналитикалык ой жүгүртүүсү, критикалык мамиле жана өз алдынча билим алуу өнүккөнү байкалган. Мугалимдердин санариптик сабаттуулугун жогорулатуу ошондой эле билим берүү процессинин эффективдүүлүгүнө чоң таасирин тийгизди. Жүргүзүлгөн изилдөө санариптик билим берүү технологияларынын студенттердин жана педагогдордун кесиптик өнүгүүсүнө оң таасирин тийгизгенин тастыктады. Бирок, инфраструктуранын жетишсиздиги, санариптик теңсиздик жана мугалимдерди окутууда кыйынчылыктар сыяктуу көйгөйлөр чечилбей калды. Санариптик технологияларды эффективдүү колдонуу үчүн мугалимдерди системалуу окутуу жана билим берүү мекемелеринин техникалык камсыздандыруусун жакшыртуу зарыл.

Негизги сөздөр: санариптик билим берүү; мугалимдердин компетенттүүлүгү; инновациялык технологиялар; онлайн окутуу; санариптик сабаттуулук; интерактивдүү методдор; профессионалдык өнүгүү

Профессиональное развитие педагогов в условиях цифровой трансформации

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Аннотация. Целью данной работы было исследовать вопросы развития цифровых навыков педагогических кадров в условиях цифровой трансформации образования, а также проанализировать использование инновационных технологий и их интеграцию в современную образовательную среду. В исследовании были рассмотрены ключевые аспекты цифрового образования, стратегии повышения цифровой компетентности педагогов и основные факторы профессионального роста. В статье рассмотрена роль цифровых образовательных технологий в учебном процессе и вопросы развития цифровой компетентности учителей. Интеграция цифровых технологий была направлена на повышение эффективности и доступности образования. В исследовании был проанализирован процесс цифровизации системы образования Кыргызской Республики, его основные направления и полученные результаты. Рассмотрены три уровня технологической компетентности учителей: базовая цифровая грамотность, организация технологической и профессиональной деятельности, информационная грамотность. В рамках исследования был проведен эксперимент с участием преподавателей и студентов высших учебных заведений. Экспериментальные группы использовали цифровые образовательные платформы (Google Classroom, Moodle, Zoom и др.) и интерактивные методы обучения (видеоуроки, онлайн-тестирование, цифровые симуляции). Сравнение результатов входного и итогового тестирования позволило проанализировать изменения в уровне знаний студентов. Результаты эксперимента показали, что в группе, использующей цифровые технологии, показатели усвоения знаний повысились на 25-30 %. Кроме того, было отмечено развитие аналитического мышления, критического подхода и самостоятельного обучения студентов. Повышение цифровой грамотности учителей также оказало значительное влияние на эффективность образовательного процесса. Проведенное исследование подтвердило положительное влияние цифровых образовательных технологий на профессиональное развитие студентов и педагогов. Однако остались нерешенными проблемы, связанные с нехваткой инфраструктуры, цифровым неравенством и трудностями в обучении педагогов. Для эффективного использования цифровых технологий необходимо проводить систематическое обучение учителей и улучшать техническое обеспечение образовательных учреждений.

Ключевые слова: цифровое образование; компетентность учителей; инновационные технологии; онлайн-обучение; цифровая грамотность; интерактивные методы; профессиональное развитие



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Assessment and monitoring of primary school students' learning

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Abstract. The main goal of the study was to identify the current state, challenges, and promising directions of the assessment and monitoring process of educational achievements of primary school students. The relevance of the study was determined by the need to improve the quality of education in the Kyrgyz Republic, to objectively assess students' achievements, and to enhance the effectiveness of the educational process in schools. In this context, it was emphasised that assessment should be closely linked with the educational process. It allows for the regular evaluation of students' progress, the introduction of adjustments based on their individual development, and the systematic improvement of teachers' instructional methods. The article thoroughly explored the concepts of formative and summative assessment, their content features, implementation methods, and impact on the educational process. Formative assessment was viewed as a method that leads students to success through continuous feedback during daily learning. It includes self-assessment, peer assessment, and both written and oral feedback. These methods help foster active participation, critical thinking, and a sense of responsibility among students. The article also discussed the development of assessment criteria, strengthening teacher-student communication, considering individual student progress, and creating equal opportunities for learners with diverse academic levels. The authors presented examples of international assessment models and showed how they can be integrated into the Kyrgyz educational system. The study concluded with specific recommendations aimed at improving the quality of primary education. Assessment was seen not only as a tool for measuring students' knowledge but also as a comprehensive mechanism for enhancing the overall educational process

Keywords: formative assessment; summative assessment; academic achievements; assessment criteria; active learning; student motivation; educational technologies

■ INTRODUCTION

The assessment and monitoring of student performance at the primary education level in the Kyrgyz Republic is considered one of the key factors for sustainable development and qualitative transformation of the country's education system. This process enhances the quality of education by updating the content of education, improving pedagogical methods, and conducting comprehensive analyses of the activities of educational institutions. Objective and continuous assessment of the educational level of primary school

students, monitoring of their learning achievements and dynamic changes in their knowledge assimilation – this contributes to the intellectual and cognitive development of children, as well as to the active functioning of the education system.

Assessment and monitoring mechanisms are only effective when they are systematically implemented as part of education policy. These mechanisms should be aimed at comprehensive analyses that include not only student

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performance, but also the quality of teaching, teachers' performance, conditions of the educational environment and models of educational process management (Kovalchuk & Kozoriz, 2020). Monitoring is not just a collection of statistical data; it is an intellectual and managerial tool to measure learning effectiveness, reduce educational inequalities and make fact-based decisions. According to G. Zhakupova (2017), the primary education sector in Kyrgyzstan is facing a number of systemic and infrastructural problems. These include the use of curricula that do not meet modern requirements, insufficient methodological training of teaching staff, weak material and technical base of schools in rural areas, and unequal access to educational opportunities. In addition, the centralised nature of the management system in educational institutions, lack of comprehensive information and limited educational resources also reduce the effectiveness of the entire education system.

In such conditions, assessment and monitoring systems play an important role as one of the main science-based tools for early identification of these problems, system-level prevention and strategic decision-making. Measuring the level of students' knowledge is not just information obtained through an exam or test, but a unified system that allows for a comprehensive analysis of students' learning dynamics, motivation for learning, logical thinking and competencies (Karpushina & Kutuzova, 2022). Such activities enhance the quality of education, support the principles of social justice and increase access to education. In addition, according to P. Gouédard (2021), assessment and monitoring systems also act as the main driving force behind reforms in the education system. They allow prioritising educational policy, working out educational standards, planning the professional development of teachers, and transforming the content and forms of education. The introduction of such systems at the primary education level is one of the necessary conditions for ensuring quality education in educational institutions and creating effective management models.

Accordingly, the creation of a scientifically based system of monitoring and evaluation of the educational process is of strategic importance for improving the effectiveness of the primary education system. It creates an opportunity to improve the professional training of teaching staff, adapt the educational process to the development of the student's personality, and effectively coordinate the activities of educational institutions. Successful implementation of innovation policy in the sphere of education in Kyrgyzstan is closely related to the qualitative formation of this system of assessment and monitoring. Therefore, this direction requires special attention in the educational strategy of the country. At a later stage, the development of qualitative indicators for assessment and monitoring of activities and the creation of integrated information systems at the national level will allow for scientific analysis of the effectiveness of education and management decisions. The introduction of such systems in the education sector of Kyrgyzstan will contribute to increasing transparency and

public confidence in education policy. The participation of parents, civil society, education experts and government agencies in this process is of particular importance, as education is one of the main areas of public interest.

For the successful functioning of assessment and monitoring systems, it is necessary to ensure their reliability, validity and sustainability. For this purpose, it is necessary to improve the qualifications of specialists, teachers and methodologists working in the field of education and to provide them with appropriate methodological and technical support (Tsymbal, 2020). It is also necessary to rely on indicators worked out on the basis of national and international research and to use objective rather than subjective indicators in measuring the quality of education. Such actions will allow the country to introduce systemic improvements at the initial stage of education and bring it closer to international standards (Janicka-Panek, 2018). Also, the use of modern educational quality assessment methods, such as STEAM methodologies, competency-based approach and digitally integrated platforms, plays a major role in developing students' creativity, critical thinking and practical skills (Ye *et al.*, 2024).

In conclusion, assessment and monitoring of learning in the primary education system of Kyrgyzstan is not only a technical, but also an ideological and strategic activity. It is one of the main factors determining the quality of the country's future intellectual capital. Such systems help to ensure equality in education, eliminate socio-cultural barriers, and reduce the gap in educational opportunities between regions. For a developing society, these processes play an important role as key tools for shaping national policy and responding to global challenges in education. The purpose of the study was to identify the current state, problems and future directions of the process of assessment and monitoring of primary school student learning.

■ MATERIALS AND METHODS

An integrated approach to the research, combining qualitative and quantitative methods, was adopted as a methodological basis. At the initial stage of the study, an analytical research method was used. At this stage, official documents adopted by the Ministry of Education and Science of the Kyrgyz Republic were studied – state educational standards, methodological recommendations for assessment, strategic development programmes, concepts and other normative acts. Reports and recommendations of international organisations – UNESCO (2024) and others – were also analysed, and the process of primary education assessment in Kyrgyzstan was compared with international experience.

The study of the real learning process was carried out on the basis of empirical methods. Teachers of general education schools were involved and a survey was conducted to find out the characteristics of their assessment in the learning process. The survey was conducted by the authors of the article from 3 to 18 June 2024 using a confidential form of remote communication through the online platform Google Forms. The study involved 20 primary school

teachers from 10 comprehensive schools in Bishkek (Author's Physics and Mathematics Complex of School-Lyceum No. 61 named after E.B. Yakirov; Author's Educational and Upbringing Complex of School-Gymnasium No. 6 named after I.V. Panfilov; School-Gymnasium No. 24 named after A. Tokombaev; Secondary Comprehensive School "School-Gymnasium" No. 69; Educational and Upbringing Complex-Gymnasium No. 69 named after T. Satylganov; Educational and Upbringing Complex of School-Gymnasium No. 68; Educational and Upbringing Complex of School-Gymnasium No. 70; Secondary Comprehensive School No. 13; Secondary Comprehensive School No. 26; Secondary Comprehensive School No. 65).

The survey included 10 questions aimed at exploring teachers' perceptions of formative and summative assessment methods and monitoring mechanisms. The survey questions are as follows:

- How do you use formative assessment in your lessons?
- Do you have any pre-worked out criteria for evaluating students? If yes, please specify.
- What kinds of feedback do you use?
- Do you use written, oral or digital tools for assessment?
- What are the main difficulties you are facing in evaluation?
- Do you monitor students' independent development?
- How do you use assessment results to adjust your teaching?
- Do students participate in self-assessment and peer-assessment during assessment?
- Do you receive methodological support for assessment?
- What changes do you think are needed to improve the assessment and monitoring system?

The conducted research and observation provided an opportunity to clarify the use of formative and summative assessment, the methodology of criteria development, active participation of students in assessment, as well as various testing methods. Based on the study, an analytical analysis of the current situation was conducted and recommendations for improving assessment and monitoring in the primary education system of the Kyrgyz Republic were worked out. The survey was conducted in accordance with the ethical standards for scientific research contained in The Guidance Note of the European Commission on Ethics and Data Protection (2021).

State and international resources were used as a database. In particular, the official website of the Ministry of Education and Science of the Kyrgyz Republic (n.d.), the platform Mektep (n.d.), archives, methodological manuals of the Department of Educational Technologies of Preschool Pedagogy and School Pedagogy of the Kyrgyz National University named after J. Balasagyn. The main sources were also scientific articles written in the field of education and the works of domestic and foreign scientists. In the theoretical part of the study, foreign scientific literature and works of famous researchers were widely

used. In particular, the works of such authors as P. Black *et al.* (2004) on formative assessment and the strategies they proposed, adapted to the Kyrgyz school environment, were considered. For example, it was analysed how the methods of "feedback", "learning objectives and success criteria" or "partner assessment" are used in the Kyrgyz context. The study also used a qualitative comparative analysis comparing methods of primary education assessment in Kyrgyzstan and other countries, identifying the advantages and disadvantages of each. Based on this comparison, a number of recommendations for improving the evaluation process were worked out. In conclusion, the research methodology combines real educational practice and theoretical orientations to provide a comprehensive analysis of the assessment and monitoring process in the Kyrgyz primary education system.

■ RESULTS AND DISCUSSION

Peculiarities of evaluation methods in the education system and their development

The Program for the Development of Education in the Kyrgyz Republic for 2021-2040 (2021) points to the need to introduce a new system for assessing students' achievements, as well as to determine not only the level of knowledge acquired in lessons, but also the individual level of each student, indicating the formation of basic and subject competencies. Methodological Guidelines for Assessment of Reading Skills in Primary Grades worked out. The guide was prepared within the framework of the USAID project "Time to Read!" (2018) and contains tools and procedures for formative assessment of reading skills in primary grades, worked out on the basis of subject standards for mother tongue and reading and tested in practice. The manual was approved and published by the Academic Council of the Kyrgyz Academy of Education on 29 August 2016 by Minutes No. 7 (Khamzina *et al.*, 2016). As the authors of the manual emphasised: "Assessment and monitoring should be used not only to measure students' achievements, but also to help teachers make decisions to improve teaching", this idea emphasises the main purpose of educational assessment in primary school students. Monitoring student achievement fulfils not only a diagnostic function, but is also one of the main tools for continuous improvement of the learning process. The educational assessment system, which combines formative and summative assessment methods, allows teachers to differentiate and individualise lessons.

According to S. Khamzina *et al.* (2016), the same manual contains the following thesis: "At the school level, assessment tools should be developed systematically, standardised and adapted to the age-specific characteristics of students", which indicates the need for a structured and scientifically based approach to the development of assessment tools. Standardised assessment tools promote fair and objective measurement of students' knowledge. In addition, taking into account the age-specific characteristics of students is an important factor in improving the quality

of education. This is due to the fact that assessment methods adapted to the level of cognitive and psychological development of students contribute to the deep learning of students. This idea is put forward by the well-known educational researcher D. William (Black *et al.*, 2004). In his view, efforts to develop, support, analyse and widely disseminate assessment for learning will only be effective if the responsibility for leading this process is given to members of the school administration. As D. William's experience shows, it would be unfair to assign this task to only a few individuals. At the same time, it is absurd to require all teachers to immediately change their roles and teaching methods. Instead, D. William proposed a three-year development plan. This plan supports small groups for two years to conduct research and development. In this way, these groups can form the core of the school's expertise and help other teachers to carry out similar experiments themselves. This approach is seen as an effective and long-term way of changing the educational culture in the school. According to V. Epaneshnikov & V. Vinogradov (2024): "Monitoring the effectiveness of forming students' technological competence based on recorded indicators of educational outcomes and indirect performance indicators is likely to change the meaning of educational activities in the future, replacing them with a set of key indicators". "The development of future educators' ability to monitor the assessment of teaching quality in the process of professional education will inevitably have a positive impact on the results and quality of students' education in the future", also noted Yu. Bogatyreva & I. Morkovina (2023).

As UNESCO (2024) noted, education systems should be seen not only as a tool to prepare people for the labour market, but also as a collective responsibility for shaping the future. Education systems should consider the process of learning for the future as a basic human right and approach the realisation of this right with mutual responsibility (UNESCO, 2023). In Russia, educational policy is also aimed at increasing the value status of supplementary education, strengthening its role in the personal and professional development of children. In this regard, supplementary education is seen as a unique social practice that promotes self-motivation and increases the innovative potential of society (Kuvshinkova & Reshetnikova, 2024). At present, the school education system is being renewed on a new conceptual basis and improved to meet the requirements of socio-economic changes. As part of the standardisation process, the methods of subject teaching, the organisation of the educational process and the assessment of students' learning achievements require updating. The assessment mechanism fulfils the function of feedback in improving the effectiveness of learning. If the teacher observes the student's development and analyses his achievements, the student will also evaluate his efforts and strive for independent development (Kaldybaev & Esenalieva, 2020). As D. Kolomiets (2013) noted: "Forecasting the development of an educational institution in the conditions of variant education will be successful if

it is based on the following monitoring indicators: study of the opinion of the subjects of the educational process, determining the level of their awareness of variant learning systems; prevention of difficulties in the use of variant learning systems on the basis of diagnostics of the child's readiness for school, study of the teacher's motivation to choose a system of developmental education; the administration's interest in the introduction of variant learning systems; and the use of variant learning systems".

For the effective use of variable learning systems, it is extremely important to ensure stability at different levels of education. This problem is also relevant in practical terms and has not yet been fully solved, as other Russian researchers have also written about in their works (Konovalchuk, 2005; Kovalenko, 2012; Sadovaya, 2013). G. Musabekova (2008) believes that the most important period for the development of children's creative abilities is the junior school age, as it is the most sensitive for the development of personal creative abilities. This once again emphasises the importance of monitoring the learning process of primary school students (Kopytova, 2003). Also, other Kazakh scientists, such as S. Abildina *et al.* (2021) believe that "...formative assessment in primary school is aimed at individual work with each student, identifying the achievements of primary school students and assessing the level of development of skills and abilities, as well as systematic measurement of students' progress in learning". This allows for accurate and objective assessment of each child's achievements, contributing to his development, taking into account the interests and abilities of the pupil.

Competency-based assessment:

Diagnostic and formative assessment methods

Azerbaijani scientist, researcher of Ganja State University L. Rustamova (2015) believes that "...today, the latest types, types and forms of learning, as well as learning modules and paradigms are identified and used in advanced science and world practice. Among these modules, communicative learning modules, constructive learning modules and cognitive learning modules are considered the latest achievements of pedagogy". Diagnostic assessment is an important tool for evaluating student performance. During the school year, the teacher determines the students' level of competence by comparing baseline and achieved results. This process is used as a basis for correcting and improving the learning process, clarifying learning objectives and optimising the teacher's instructional strategies. The results of the diagnostic assessment are summarised in a descriptive form and contribute to decision-making about the learning process. Formative assessment is carried out taking into account the student's pace and ways of learning. This method makes it possible to determine a student's progress and to make timely adjustments to the learning process and changes to the curriculum. Through formative assessment, students can improve the quality of their work and increase their learning achievements. Formative assessment is also used to develop methodological recommendations

aimed at student success and the formation of individual educational trajectory (State Educational Standard of General School Education of the Kyrgyz Republic, 2022).

A student's progress is determined by the specific work the student does and is an indicator of the achievement of specific educational goals. To continuously monitor this progress, the teacher records the student's achievements and tracks the dynamics of individual learning. Final assessment is aimed at determining the level of achievement of the student's planned results at each stage of learning. This attestation is carried out on the basis of current, interim and final attestation and allows an objective assessment of a student's knowledge and competence. Competences are formed not only in the educational environment, but also on the basis of a variety of social and practical activities outside the school. Therefore, one of the main tasks of the school is to develop an educational environment for students and to teach them to use their acquired knowledge effectively in everyday life situations. In order to achieve this goal, the following conditions must be ensured:

- The organisation of the learning process should be oriented towards students' independence, efficiency and responsibility;

- Students should be actively involved in a variety of research, project, community and extracurricular activities;

- Situations should be created that allow students to put knowledge into practice;

- In the assessment process, students' learning achievements should be constantly analysed and necessary adjustments made;

- School teachers should be able to effectively use competency-based teaching methods in the educational process.

Creating such conditions increases students' motivation for the educational process and has a positive impact on their personal and academic development (Orolov *et al.*, 2023). Assessment and monitoring of primary school students' education is an important part of the educational process. Formative assessment (formative assessment) aims at daily monitoring of students' knowledge after each assignment based on assessment criteria. Self-assessment, peer-assessment and teacher feedback play a key role in this process. The teacher should monitor students' understanding of the learning objectives and assessment criteria and work out them with them. This approach improves students' attitudes towards assessment and enhances the quality of learning.

The survey data revealed a number of important trends in assessment and monitoring practices among primary school teachers. Based on the answers of 20 teachers who participated in the survey, the data were systematised and presented in the form of aggregated percentage indicators (Table 1).

Table 1. Teachers' answers to questions (in %)

No.	Question	Yes (%)	No (%)	Comments/additional answers
1	How do you use formative assessment in your lessons?	85	15	Most reported using it daily
2	Do you have any pre-worked out criteria for evaluating students? If yes, please list them.	75	25	Some teachers complain about the lack of criteria
3	What type of feedback do you use?	100	0	Oral – 100%, written – 45%, digital – 35%
4	Do you use written, oral or digital tools for assessment?	35	65	The level of digital literacy is low
5	What are the main difficulties you are facing in evaluation?	90	10	Lack of time and methodological support
6	Do you monitor students' independent development?	60	40	Most limit themselves to keeping a diary
7	How do you use assessment results to adjust your teaching?	65	35	Answers varied (most use it when planning work)
8	Do students participate in self-assessment and peer-assessment during assessment?	45	55	Many feel that their methodological knowledge is insufficient
9	Do you receive methodological support for evaluation?	40	60	There is a shortage of new teachers in the regions
10	What changes do you think are needed to improve the assessment and monitoring system?	–	–	1) Professional development, 2) Digital tools, 3) Time resources

Source: developed by the authors

In general, it was noted that most teachers understand the basic methods of formative assessment and use them in their lessons. However, this use is only at an intuitive level and is not systematic and strategic. For example, although 85% of teachers stated that they use formative assessment on a daily basis, only 75% indicated that they use pre-designed criteria. This indicates a lack of methodological preparation of teachers to use formative assessment.

The level of use of digital tools remains low – only 35% of teachers indicated that they use digital tools. This indicator confirms the need for further work in the direction of digitalisation of education. In addition, the insufficient use of self- assessment and peer-assessment elements (45%) limits students' opportunities to develop reflective and

analytical skills. Lack of methodological support and lack of time were identified as the main obstacles in the evaluation process. 60% of teachers indicated that they do not receive methodological support and 90% indicated that they do not have enough time. This indicates the need for teacher training, availability of guidance materials and increased administrative support. The following main conclusions were drawn from the survey:

1. Formative assessment is widely used but lacks consistency: teachers report working out criteria independently or applying them inaccurately.

2. Education and technical support are needed when moving to digital tools, as access to the Internet and tools can be varied.

3. The lack of methodological support has been a major obstacle in the evaluation process.

4. There are no standardised monitoring tools.

5. Teachers' competence in using assessment results to improve lessons needs to be improved.

J. Balasagyn's pedagogical ideas are also important to consider when improving the assessment and teaching process. His views on education, morality and upbringing have not lost their relevance in modern pedagogy. In his works J. Balasagyn expressed valuable ideas about the acquisition of knowledge, its continuous improvement and development of personal qualities. Nowadays, active teaching of students on the basis of formative assessment, development of their thinking abilities and inculcation of moral values correspond to J. Balasagyn's educational philosophy. Therefore, the use of his approach to education in modern pedagogy makes a significant contribution to improving

the level of students' education and the quality of education. When conducting formative assessment, the teacher should clearly define the content and objectives of the lesson and work out the assessment criteria together with the students. The more precise the criteria, the more successful the task will be. When using assessment technologies, the teacher should be aware of the reproductive, productive and creative levels of learning of the topic, determine the expected results of a particular lesson and choose appropriate teaching methods. It is also necessary to work out assessment criteria and prepare appropriate tasks together with the students. The methods of formative assessment include interactive methods such as "Hand Signals", "Thumb Signals", "Traffic Light", "Dice", "Plus-Minus-Interesting", "KWL". The methods "Inner and Outer Circle", "Moving Pairs", "Two Stars – One Wish" are used for mutual evaluation (Table 2).

Table 2. Explanation/description of interactive methods

Method/approach	Explanation/Description
Hand Signals	The student raises a hand or uses a specific gesture to show whether they understand or not
Thumb Signals	Students show a thumbs up (understood), sideways (partially understood), or down (did not understand)
Traffic Light	Students evaluate using coloured cards: red (did not understand), yellow (partially understood), green (fully understood)
Dice	A die with different questions or tasks on each side is rolled, and students respond to the side that lands face up
Plus-Minus-Interesting	"+" – positive aspects, "-" – negative aspects, "I" – interesting facts or thoughts are written down
KWL (Know – Want to Know – Learned)	Students write what they knew before the topic, what they want to know, and what they learned after the lesson

Source: developed by the authors

During the self-assessment, students have the opportunity to find their own mistakes and to reflect by commenting on them. Once the assessment criteria have been developed, appropriate point descriptors are established, which the teacher specifies in advance. During the lesson, these criteria are written on the board and agreed with the students. These criteria are used in different types of assessment – summative, formative and diagnostic. Summative assessment is carried out at the end of a topic or unit in order to assess students' achievements. For this purpose, the teacher needs to review the topics in the curriculum and determine the assessment criteria based on Bloom's Taxonomy. It is recommended to work out descriptors for each assignment and use them in the assessment process. The final assessment should take 15-20 minutes to complete.

Using feedback to assess student learning

Feedback is one of the most important and fundamental tools of the educational process. It significantly helps teachers and students to interact, learn and improve the quality of learning. Feedback serves as a primary mechanism for developing, correcting errors and guiding students to achieve educational success. For students, feedback is an effective tool in the learning process because it allows them to see their mistakes and strengths. Feedback is used at various levels throughout the learning process. For learners,

this feedback should include important information directly related to their learning, critically evaluated outcomes and progress. In schools, feedback is usually provided in two main ways: orally and in writing. Oral feedback should be immediate and specific, while written feedback is often provided in the form of descriptions of methods, suggestions, and errors. Such feedback can help students change their view of learning and develop new perspectives.

The assessment process itself also includes important aspects of feedback. Through assessment, teachers can identify students' learning and guide them towards improved, confident and effective learning. Assessment includes various forms that work closely together. For example, summative assessment (results of achievement over the academic year), formative assessment (periodic assessment of particular aspects) and diagnostic assessment (determining progress in learning) are used together to enhance the effectiveness of assessment. Feedback is crucial because it guides the learner in the right direction. In formative assessment, feedback is often used to track progress between lessons, allowing teachers to analyse students' work throughout the day and help them self-regulate. Providing this feedback is one of the most important aspects of teaching, beyond the "butterfly" between teacher and student. To be effective, feedback needs to be meaningful, clear and concise so that the student can see exactly what

they need to work on, correct their shortcomings and strive to improve their performance in the future.

The process of assessment has social, pedagogical and organisational significance. Feedback is a highly valued aspect of primary and secondary education. Its value is often aimed at improving the accuracy of the various forms of assessment used by teachers in lessons. By conducting formative assessment during a lesson, teachers are able to provide the necessary feedback to improve students' knowledge. By identifying errors, the feedback promotes sustainability and future action. This process is also seen as an analysis that allows teachers to work out their own lessons. Diagnostic assessment plays an important role in feedback. It aims to quickly identify various errors and the level of knowledge of the teacher. It gives an idea of the essence of knowledge gained by each student in the lesson. In this case, the feedback facilitates the student's confident participation in the educational process. Feedback obtained through pre-testing, intermediate control works, practical assignments and written tests ensures the improvement of the student's skills in independent and group work.

It is also important to provide feedback to teachers, both individual and group, on a reasonable basis. The essence of feedback is its concreteness and clarity in concrete actions. The advice and suggestions that feedback gives in assessing the level of knowledge of students have a positive impact on their development. Feedback in teaching allows students to correct mistakes and use them in practice to improve their strengths. This system provides high quality feedback and makes learning more productive. It is clear from the above that feedback has become the first and most important tool of the educational process. Unfortunately, if feedback is organised ineffectively, it will not contribute to the improvement of students' education. To prevent this from happening, teachers should pay great attention to the organisation of a complete feedback system, its implementation, as well as checking individual student achievements. Brief recommendations from the study: work out national guidelines on assessment and monitoring; organise regular professional development courses for teachers; provide training on the use of digital tools; promote specific techniques to develop students' self- and peer-assessment skills; school administrators should consider mechanisms for allocating time and resources for teachers to conduct assessments.

■ CONCLUSIONS

The results of the study clearly show that assessment and monitoring of primary school students is one of the main factors in improving the quality of the learning process. The study revealed that various forms of assessment used in primary school students, especially formative assessment, have a direct impact on students' attitudes and engagement in learning. It was observed that the teacher's choice of assessment methods in accordance with the individual characteristics of students contributes to increasing their confidence and responsibility. This, in turn,

enables students to think independently, set personal goals and make more effort to achieve them. The data obtained in the course of the study show that the use of clear and unambiguous assessment criteria contributes to the correct and successful completion of tasks by students. They begin to realise what they need to learn, how to achieve it and from what point of view they can assess their current level. This is useful not only for students, but also for teachers: they can identify each student's strengths and needs and work out individualised learning strategies. In addition, skills such as self-assessment and peer-assessment, which are part of formative assessment, teach students to be reflective, to express an informed opinion and to develop themselves.

One of the practical results of the study is the effectiveness of the visual and interactive methods used in the assessment process (e.g. "Traffic Light", "Hand Signals"). These methods allow learners to provide feedback in a simple and understandable way. Students are able to immediately assess their progress and seek help or regroup if necessary. In turn, these methods help teachers to immediately identify weaknesses or strengths in the learning process and adjust the direction of learning. When organising summative assessment, dividing tasks by level of difficulty using the principles of Bloom's taxonomy plays an important role in the development of students' analytical and logical thinking. This approach allows for a deeper assessment of students' knowledge through the content of assignments. Also, working with descriptors gives students a clear direction and encourages them to compare and evaluate their achievements.

In practical terms, the results of this study will help teachers to organise quality feedback in the learning process. Teachers will be able to determine which methods and types of assessment will be effective, taking into account individual characteristics of students. In addition, a mechanism will be created to help parents understand their children's academic success and guide them in the right direction. Based on the findings, it is clear that further research in this area is needed. In particular, one relevant area for the future is to deeply explore the effectiveness of using digital platforms and artificial intelligence in the assessment and monitoring process. It is also important to study the adaptation of assessment mechanisms in different schools depending on regional and social conditions. After all, every student has different learning opportunities and difficulties, and the success of assessment is ensured by a system designed with these characteristics in mind.

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Башталгыч класстагы мектеп окуучуларынын билим алуусун баалоо жана мониторинг жүргүзүү

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Аннотация. Изилдөөнүн негизги максаты – башталгыч класстагы мектеп окуучуларынын билим алуусун баалоо жана мониторинг жүргүзүү процессинин учурдагы абалын, көйгөйлөрүн жана келечектүү багыттарын аныктоо. Изилдөөнүн актуалдуулугу Кыргыз Республикасында билим берүүнүн сапатын жогорулатуу, мектеп окуучуларынын жетишкендиктерин так жана объективдүү баалоо, билим берүү мекемелеринде окутуунун эффективдүүлүгүн арттыруу зарылчылыгы менен негизделет. Мунун алкагында баалоо билим берүү процесси менен тыгыз байланышта жүрүшү керектиги белгиленет. Ал окуучулардын билим алуудагы жетишкендиктерин мезгил-мезгили менен баалап, жеке өнүгүүсүнө ылайык түзөтүүлөрдү киргизүүгө, ошондой эле мугалимдин сабак өтүү усулдарын ырааттуу жакшыртууга өбөлгө түзөт. Макалада формативдик (калыптандыруучу) жана суммативдик (жыйынтыктоочу) баалоо түшүнүктөрү кеңири баяндалып, алардын мазмундук өзгөчөлүктөрү, ишке ашыруу жолдору жана билим берүүдө тийгизген таасирлери салыштырмалуу талданат. Формативдик баалоо – бул окуучунун күнүмдүк үйрөнүү процессинде ага үзгүлтүксүз байланыш берүү аркылуу, ийгиликтерге жеткирүүчү метод катары каралат. Анда өз алдынча баалоо, бири-бирин баалоо, жазуу жана оозеки пикир берүү сыяктуу ыкмалар камтылат. Бул ыкмалар окуучунун жигердүү катышуусун, сынчыл ой жүгүртүүсүн жана жоопкерчилигин өнүктүрүүгө жардам берет. Ошондой эле, макалада баалоо критерийлерин иштеп чыгуу, мугалим менен окуучунун ортосундагы баарлашууну бекемдөө, окуучунун ийгилигин жекече эске алуу жана ар кандай билим деңгээлиндеги окуучулар үчүн тең мүмкүнчүлүктөрдү түзүү маселелери көтөрүлөт. Автор тарабынан эл аралык практикага негизделген баалоо моделдеринин артыкчылыктары жана аларды кыргыз билим берүү системасына интеграциялоо ыкмалары мисалдар менен көрсөтүлөт. Изилдөөнүн жыйынтыгында башталгыч класстарда билим сапатын жогорулатуу үчүн конкреттүү сунуштар берилет. Анда баалоо окуучунун жетишкендигин гана эмес, жалпы билим берүү процессинин натыйжалуулугун жогорулаткан комплекстүү механизм катары каралат.

Негизги сөздөр: формативдик баалоо; суммативдик баалоо; окуу жетишкендиктери; баалоо критерийлери; активдүү окутуу; окуучулардын мотивациясы; билим берүү технологиялары

Оценивание и мониторинг обучения учащихся начальных классов

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Аннотация. Основная цель настоящего исследования – определить текущее состояние, проблемы и перспективные направления процесса оценки и мониторинга образовательных достижений учеников начальных классов. Актуальность исследования обусловлена необходимостью повышения качества образования в Кыргызской Республике, объективной оценки достижений школьников и повышения эффективности учебного процесса в образовательных учреждениях. В этом контексте подчеркнута необходимость тесной связи между оцениванием и образовательным процессом. Оценка позволяет регулярно анализировать успехи учащихся, вносить коррективы с учетом их индивидуального развития, а также совершенствовать методику преподавания учителей. В статье подробно рассмотрены понятия формативного (формирующего) и суммативного (итогового) оценивания, их содержательные особенности, способы реализации и влияние на образовательный процесс. Формативное оценивание рассмотрено как метод, способствующий достижению успеха учащимися за счет постоянной обратной связи в процессе повседневного обучения. Оно включает такие методы, как самооценка, взаимная оценка, письменная и устная обратная связь. Эти подходы способствуют развитию активного участия, критического мышления и ответственности у учащихся. Также в статье подняты вопросы разработки критериев оценивания, укрепления коммуникации между учителем и учеником, индивидуального подхода к успехам учащихся и создания равных возможностей для школьников с разным уровнем подготовки. Авторы на примерах продемонстрировали преимущества оценочных моделей, основанных на международной практике, и варианты их интеграции в кыргызскую систему образования. В завершение исследования представлены конкретные рекомендации по повышению качества начального образования. Оценивание рассматривалось не только как способ измерения знаний ученика, но и как комплексный механизм улучшения всего образовательного процесса.

Ключевые слова: формативное оценивание; суммативное оценивание; учебные достижения; критерии оценивания; активное обучение; мотивация учащихся; образовательные технологии



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Analysis of the opinions of English teachers on the subject program in public schools

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Abstract. Modern reforms in the educational system of Kyrgyzstan dictate the need for regular evaluation and adaptation of subject programmes, especially in the context of the rapidly changing realities of English language teaching. This study was aimed at identifying and analysing the opinions of public school English teachers regarding the effectiveness and practical applicability of the current subject programme. A quantitative screening model with questionnaire survey (SPSS Statistics) was used for data collection. The focus group consisted of 50 English teachers from public schools in Bishkek, selected by random sampling method. The analysis covered teachers' opinions on the content of the programme, clarity of objectives, adequacy of teaching materials and applicability of assessment methods. Despite the generally positive perception of the programme, teachers identified a number of significant shortcomings: insufficient clarity in the formulation of objectives, inconsistency of teaching materials with the age and level of students' training, lack of relevant audio and video materials, as well as difficulties in implementing the recommended approaches in real school practice. In addition, there was a discrepancy between the content of the learning tests and the subject matter of the course. The practical value of the study lies in providing empirical data that can be used in refining and updating the English language subject programme, as well as in developing methodological recommendations for teachers and educational policy makers. The findings emphasised the importance of taking into account teachers' opinions in order to improve the effectiveness of teaching and the quality of education

Keywords: subject programme; English language programme; programme evaluation; foreign language teaching; teachers' opinions

■ INTRODUCTION

The development of information and communication technology has undoubtedly made English an accepted language in the 21st-century world. As a foreign language, English has benefited individuals and countries in terms of their cultural, political and economic relations, which is the main reason why it is widely taught in schools and other educational institutions. The desire to learn foreign languages is growing all the time. English lessons in public

and private institutions have become one of the subjects to which both students and parents attach great importance. As technology and science have developed, the importance of learning a foreign language has been emphasised in various educational discussions and curriculum development studies.

Reforms in Kyrgyzstan have focused on developing modern English language teaching methods, but there

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are problems with programme implementation (Liddicoat, 2025). According to the systemic structure of education, educational programmes are one of the factors influencing productivity and an indispensable input for planned education. In this context, G. Posner (1992) pointed out that in order to evaluate the effectiveness of the implemented programme, it is necessary to identify deficiencies and omissions in the elements of the programme based on appropriate criteria. In the field of the role of information technology, A. Tuxtayeva & N. Teshaboyeva (2024) in their article noted the importance of English in providing global communications and working with modern technologies and presented its study as a basic condition for science, education, tourism and career development. In the field of artificial intelligence, J. Han *et al.* (2023) studied the role of RECIPE, a platform designed for English language learning, and ChatGPT in the development of writing skills, noting their contribution to students' independent work and feedback process. AI platforms such as ChatGPT can be used as interactive language learning assistants, providing students with live feedback on grammar checks, style sentences and creative tasks (Degtiarova *et al.*, 2022; Prokhorchuk, 2023). The RECIPE platform is unique in that it uses ChatGPT's NLP (natural language processing) technology to automatically analyse students' writing errors and create personalised learning methods. In particular, augmented reality technology has been shown to increase students' motivation and performance when teaching English in rural primary schools in China, as shown in a study by I. Haq (2023).

The development of mobile and online platforms, especially highlighted by E. Carter (2025), makes learning English accessible, efficient and promotes a personalised approach. This process is also complemented by artificial intelligence and machine learning. According to N. James (n.d.), artificial intelligence technologies optimise learning processes through online platforms and enable adaptive learning. In addition, gamification elements (e.g. game assignments, point system) analysed by Smooth English Company (n.d.) increase students' motivation and promote deep learning.

A combination of three factors: (1) mobile/online platforms make learning independent of time and place; (2) artificial intelligence and machine learning offer adaptive, personalised techniques; (3) gamification increases fun and engagement – together, these aspects define the dynamics of modern language learning. At the same time, some studies have shown that there are discrepancies between the goals of the English language learning programme and actual classroom practice. For example, problems such as inadequate teacher training, lack of teaching materials and weak technological base have been identified (Kazakbaeva, 2021). Subject programmes provide teachers with instructions on what framework plan to follow in lessons and what assessment methods to use. Considering this function of the programme, it can be stated that creating programmes in Kyrgyzstan that will prepare students who are able to use a foreign language effectively and correctly is an important

requirement. In the process of programme development, it is necessary to identify the shortcomings of the current programme and correct these shortcomings in the new prepared programme. First of all, wrong methods must be discarded. Since language is a means of communication that provides information, it is necessary to provide comprehensive information for learning a foreign language (Işık, 2008). Because in foreign language teaching, due to the studies that focus on teaching language elements, the subject of understanding is overlooked and effectiveness is not achieved.

The aim of the research was to study the impact of modern technologies and methodologies on the educational process in the field of English language learning, including such tools as artificial intelligence, augmented reality and online platforms. The study intended to identify the potential of these technologies to enhance the effectiveness of language learning and work out practical and methodological recommendations. In addition, the study aimed to analyse the strengths and weaknesses of the English language curriculum, including the adequacy of content, objectives, materials and assessment methods, based on teachers' opinions. This information can help to improve the effectiveness of the English language curriculum and promptly identify and address weaknesses. The results of the study will serve as an important basis for curriculum developers, policy makers and practising teachers to guide their future activities.

■ MATERIALS AND METHODS

In this study, a quantitative screening model was used to determine teachers' opinions about the subject programme. A screening model is a research method that allows for the most objective and accurate description of a current or past phenomenon (Karasar, 1994). This model allows for observation in a natural setting without making changes to the current situation and collecting data without intervention (Yıldırım & Şimşek, 2006). The study was conducted from September 2024 to January 2025. Teachers of general education organisations were selected as the object of the study. Teachers of urban and rural schools were taken as the general population. 100 teachers from 10 schools (10 teachers from each school) were selected as a sample (focus group) according to special criteria. The selection was based on such factors as age, length of service and subject taught. The study involved English language teachers working in public schools under the jurisdiction of the Ministry of Education of Kyrgyzstan in Bishkek. Due to the impossibility of contacting all teachers, a random focus group sampling method was used. As part of this approach, questionnaires were sent to teachers through Google Forms and relevant responses were selected and analysed. As a result of the survey, the focus group of the study consisted of 50 English teachers. The study was conducted in full compliance with the ethical guidelines (European Commission Guidance Note, 2021). Participants were informed in advance of the purpose, content and results of the study. Written consent was obtained from each participant.

The data for the study was collected through a questionnaire worked out by the researcher and tested and edited by industry experts to determine the attitudes of English language teachers towards the subject curriculum. The questionnaire consisted of 18 items and 5 response options such as “Strongly agree”, “Agree”, “Difficult to answer”, “Disagree” and “Strongly disagree” and independent sections such as “General characteristics of the curriculum, objectives, tools and assessment opportunities”. To determine the consistency of the results obtained from all items of the questionnaire (18 items), a Cronbach-Alpha reliability test was conducted. This is an internal consistency criterion based on the assumption that a measurement instrument consists of independent items and has the same

weight for a particular goal (Karasar, 1994). The test resulted in a value of $\alpha = 0.89$, which provided a basis for the existence of internal consistency between all items of the scale. The questionnaire contained 10 positive and 8 negative items. The data collected from the questionnaires were coded from 1 to 5, considering the positive and negative aspects of the questions, and entered into a computer. Their frequency and percentage were then calculated using SPSS Statistics 23 programme and an attempt was made to find answers to the research objectives questions.

RESULTS AND DISCUSSION

The results of the study reflect participants' views on the general features of the subject programme (Table 1).

Table 1. Frequency and percentage of opinions about the general characteristics of the subject programme, $n = 50$

No.	Statement	Strongly disagree		Disagree		Difficult to answer		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
1	The content of the subject programme encourages pupils to learn English with love and interest.	2	4	2	4	17	34	22	44	7	14
2	The curriculum aims to positively influence students' attitudes towards learning English.	1	2	6	12	14	28	23	46	6	12
3	The subject curriculum provides the teacher with sufficient guidance.	1	2	5	10	16	32	20	40	8	16

Source: created by the authors

Table 1 presents English teachers' opinions about the general characteristics of the English subject programme. As can be seen from the table, this section consists of 3 items. The analysis of the Table 1 revealed that teachers' opinions about the general characteristics of the subject programme are generally positive. Specifically, 58% of the participants ($n = 29$) stated that the content of the subject programme promotes students' love and interest in learning English and that the subject programme can positively influence students' attitudes towards learning

English. In addition, 28 teachers (56%) stated that the subject programme provides teachers with sufficient guidance. Notably, 28-34% of the participants refused to answer this question.

The study of respondents' opinions about the objectives of subject programmes allows to identify the main priorities in the educational process. In particular, the analysis revealed the objectives that participants consider the most important. The frequency and percentage of these opinions are presented in Table 2.

Table 2. Frequency and percentage of opinions about the objectives of the subject programme, $n = 50$

No.	Statement	Strongly disagree		Disagree		Difficult to answer		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
1	The purpose of the subject programme is reasonably clear and straightforward.	2	4	7	14	14	28	22	44	5	10
2	The objectives of the subject programme do not correspond to the age characteristics of students.	3	6	13	26	14	28	15	30	5	10
3	The recommended equipment (audio-video) is sufficient to achieve the objectives of the subject programme.	12	24	15	30	7	14	14	28	2	4
4	The number of words recommended for teaching in the subject programme is insufficient.	1	2	14	28	13	26	21	42	1	2

Source: created by the authors

Table 2, consisting of 4 items, presents the English teachers' views on the objectives of the English curriculum. As a result of data analysis, 54% of participants ($n = 27$) stated that the objectives of the subject programme were clear and understandable (28% could not say for sure, 18% did not think they were clear and understandable), 40% ($n = 20$) stated that the objectives of the subject programme were not age-appropriate (32% disagreed, 28% could not say for sure), 54% ($n = 27$) stated that the equipment (audio-video) recommended for use is not enough to achieve the objectives of the subject syllabus (32% disagree, 14%

cannot say for sure), 44% ($n = 22$) stated that the number of words recommended for teaching in the subject syllabus is not enough (30% disagree, 26% cannot say for sure). The study of respondents' opinion about the content of the textbook used in the curriculum showed that opinions about its relevance, completeness and compliance with educational requirements differed. The majority of participants noted that the content of the textbook partially meets their expectations, but there were also critical comments on some sections. Detailed information about the distribution of opinions is presented in Table 3.

Table 3. Frequency and percentage of opinions about the content of the textbook used in the subject programme, $n = 50$

No.	Statement	Strongly disagree		Disagree		Difficult to answer		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
1	The textbook meets the aims of the programme.	1	2	12	24	10	20	23	46	4	8
2	The order in which information is presented in the textbook is orientated from simple to complex.	1	2	4	8	9	18	33	66	3	6
3	There are not enough exercises on one topic in the textbook.	6	12	16	32	9	18	19	38	0	0
4	The pictures and diagrams used in the textbook make it easier for students to understand the topic.	2	4	5	10	6	12	32	64	5	10
5	Students find it difficult to understand the texts in the textbook.	1	2	6	12	7	14	29	58	7	14
6	The textbook gives ample examples.	3	6	11	22	6	12	24	48	6	12
7	The textbook does not allocate time to each unit according to the level of difficulty.	2	4	12	24	15	30	20	40	1	2

Source: created by the authors

Table 3 presents English teachers' opinions about the content of the textbook used in the English language subject programme. As can be seen from the table, this section consists of 7 items. As a result of the table analysis, the majority of participants 54% ($n = 27$) stated that the textbook meets the objectives of the programme, 72% ($n = 34$) stated that the order of presentation of information in the textbook is oriented from simple to complex, 38% ($n = 19$) stated that the exercises provided in the textbook for one topic are not enough, 74% ($n = 37$) stated, that the pictures and diagrams used in the textbook make it easier for students to understand the topic, 72%

($n = 34$) stated that the texts in the textbook are complex, 60% ($n = 30$) stated that there are enough examples in the textbook (28% disagreed), and 42% ($n = 21$) stated that each section in the textbook is not divided by time and level of difficulty.

A survey of participants on the evaluation and implementation of the programme showed that opinions differed according to a number of factors, including the practical applicability and relevance of the content. The data obtained indicated that perceptions of the programme were mixed among both faculty and students. Detailed data are presented in Table 4.

Table 4. Frequency and percentage of opinions on the level of evaluation and implementation of the training programme, $n = 50$

No.	Statement	Strongly disagree		Disagree		Difficult to answer		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
1	The teaching methods suggested in the curriculum are difficult to apply in a classroom setting.	0	0	0	0	14	28	17	34	17	34
2	It is not possible to assess all 4 skills (listening, reading, writing, speaking) presented in the subject programme at one time.	0	0	13	26	14	28	20	40	3	6
3	The test pattern presented in the subject programme can serve as a guide for preparing tests for other units.	2	4	9	18	15	30	22	44	2	4
4	The sample test given in the course curriculum will be suitable for assessment.	0	0	13	26	13	26	24	48	0	0

Source: created by the authors

The results of the study show that English teachers' opinions on the evaluation and implementation of the curriculum are divergent. Almost a third of the participants noted the difficulties in fully applying the teaching methods proposed in the curriculum in their classes, which indicates the obstacles for some teachers in the practical application of the methodological recommendations. Also, 46% of the participants noted the impossibility of comprehensive assessment of the four basic language skills (listening, reading, writing, speaking) specified in the curriculum, which casts doubt on the practical effectiveness of the assessment methodology. Thus, teachers' views on the subject programme and the limitations of its use are consistent with the findings of other studies, confirming the need to revise the programme and methodological support to enhance learning. Similar problems have been identified in Turkey by B. Varol (2018), D. Büyükahıska (2019), and in Kyrgyzstan and Kazakhstan by K. Cesur *et al.* (2023), indicating regional challenges in programme adaptation.

The problems identified in this study with inconsistency of teaching materials, lack of clarity of programme objectives and difficulties in applying interactive teaching methods are confirmed in a number of other research papers. For example, A. Littlejohn (2011) emphasised the importance of their relevance to the real needs of learners and methodological objectives. Moreover, the difficulties in implementing effective teaching approaches, especially interactive methods, as noted by D. Qambarova (2022), can reduce students' interest and learning productivity. This is particularly relevant in the context of higher education reforms in the Kyrgyz Republic, where changes in the educational environment require flexibility and adaptation of programmes (Shadymanova & Amsler, 2018). The challenges associated with qualitative data analysis, as pointed out by M. Miles *et al.* (2014), are also relevant for evaluating the effectiveness of training programmes, as inaccurate or incomplete data can lead to incorrect conclusions. The data obtained in this study reflect the general trends and challenges characteristic of the educational system in the region, which only reinforces the need for systemic changes.

■ CONCLUSIONS

The study revealed a number of aspects that could be considered important for the implementation of the English language subject programme in public schools. It is important to note that the quality of the educational process is significantly affected by the insufficient provision of multimedia materials recommended by the programme. It is possible that a lack of or limited access to modern audio and video resources may hinder the full use of interactive

teaching methods, reduce student engagement and negatively affect the effectiveness of learning. In the context of rapidly changing educational standards and the increasing role of digital technologies, it could be said that adequate resource provision becomes an indispensable condition for improving the quality of foreign language teaching.

In addition, the analysis has shown that the content of the current textbooks does not correspond to the actual needs of students. The textbooks do not fully cover the necessary amount of new vocabulary and grammatical structures, contain insufficient number of relevant exercises, as well as illustrative material (diagrams, pictures), which facilitates visualisation and better understanding of complex concepts. It was also noted that there is a need for more flexibility in the presentation of the material in order to make it suitable for different levels of training and age characteristics of students. Based on the data obtained, the following key areas are recommended to improve the quality of English language teaching: ensure universal access to multimedia resources (audio and video databases should be centrally introduced and regularly updated, making them easily accessible to teachers and students); modernise the content of textbooks (textbooks should be revised to reflect modern teaching methods, include relevant vocabulary, an adequate number of exercises and a variety of illustrative materials); and improve the quality of English language teaching (textbooks should be updated to include relevant vocabulary, an adequate number of exercises and a variety of illustrative materials). Implementing these recommendations will significantly improve the quality of teaching, increase students' motivation and, as a result, their level of English language proficiency. In order to gain a deeper understanding of the situation and further improve the programme, it is suggested that follow-up studies covering aspects such as students' motivation to learn the language, the impact of digital technologies on the educational process, and the effectiveness of different assessment methods be conducted. These studies, conducted using wider surveys and focus groups, will provide comprehensive information on the current status and future needs of English language teaching in public schools.

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Мамлекеттик мектептердеги англис тили мугалимдеринин предметтик программага карата көз караштарынын изилдениши

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Аннотация. Кыргызстандын билим берүү системасындагы учурдагы реформалар предметтик программаларды үзгүлтүксүз баалоону жана адаптациялоону талап кылууда, өзгөчө англис тилин окутуунун тез өзгөрүп жаткан реалдуулук шарттарында. Бул изилдөө мамлекеттик мектептердин англис тили мугалимдеринин учурдагы предметтик программанын эффективдүүлүгү жана практикалык колдонулушу боюнча пикирлерин аныктоо жана талдоо максатын көздөгөн. Маалыматтарды чогултуу үчүн анкета сурамжылоосу менен сандык скрининг (SPSS Statistics) модели колдонулган. Фокус-топко Бишкектин мамлекеттик мектептеринен кокус тандоо жолу менен тандалып алынган 50 англис тили мугалими кирди. Талдоодо программанын мазмуну, максаттардын тактыгы, окуу материалдарынын шайкештиги жана баалоо ыкмаларынын колдонулушу боюнча мугалимдердин пикири камтылган. Программанын жалпысынан оң кабыл алынганына карабастан, мугалимдер бир катар олуттуу кемчиликтерди аныкташты: максаттарды түзүүнүн жетишсиз айкындыгы, окуу материалдарынын окуучулардын жаш өзгөчөлүгүнө жана даярдоо деңгээлине ылайык келбегендиги, тиешелүү аудио жана видеоматериалдардын жетишсиздиги, ошондой эле реалдуу мектеп практикасында сунушталган ыкмаларды ишке ашыруудагы кыйынчылыктар. Мындан тышкары, билим берүү тесттеринин мазмуну менен курстун темасынын ортосунда карама-каршылык байкалды. Изилдөөнүн практикалык мааниси англис тилинин предметтик программасын тактоодо жана жаңылоодо, ошондой эле билим берүү саясатын түзүүчү мугалимдер жана адистер үчүн методикалык сунуштарды иштеп чыгууда колдонула турган эмпирикалык маалыматтарды берүү болуп саналат. Алынган жыйынтыктар окутуунун натыйжалуулугун жогорулатуу жана билим берүүнүн сапатын жогорулатуу үчүн мугалимдердин пикирлерин эске алуунун маанилүүлүгүн белгиледи.

Негизги сөздөр: предметтик программа; англис тили программасы; программаны баалоо; чет тилин окутуу; мугалимдердин пикири

Анализ мнений учителей английского языка о предметной программе в государственных школах

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Аннотация. Современные реформы в образовательной системе Кыргызстана диктуют необходимость регулярной оценки и адаптации предметных программ, особенно в контексте быстро меняющихся реалий преподавания английского языка. Данное исследование было направлено на выявление и анализ мнений учителей английского языка государственных школ относительно эффективности и практической применимости действующей предметной программы. Для сбора данных была использована количественная скрининговая модель с анкетным опросом (SPSS Statistics). Фокус-группу составили 50 учителей английского языка из государственных школ Бишкека, отобранные методом случайной выборки. Анализ охватил мнения педагогов о содержании программы, ясности целей, адекватности учебных материалов и применимости методов оценивания. Несмотря на в целом положительное восприятие программы, учителя выявили ряд существенных недостатков: недостаточную четкость формулировок целей, несоответствие учебных материалов возрастным особенностям и уровню подготовки учащихся, нехватку актуальных аудио- и видеоматериалов, а также сложности в реализации рекомендованных подходов в реальной школьной практике. Кроме того, отмечено расхождение между содержанием учебных тестов и тематикой курса. Практическая ценность исследования заключается в предоставлении эмпирических данных, которые могут быть использованы при доработке и обновлении предметной программы по английскому языку, а также при разработке методических рекомендаций для учителей и специалистов, формирующих образовательную политику. Полученные результаты подчеркнули важность учета мнения педагогов для повышения эффективности преподавания и улучшения качества образования

Ключевые слова: предметная программа; программа по английскому языку; оценка программы; преподавание иностранного языка; мнение учителей



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Modern trends in learning German: The use of technologies and interactive methods

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Abstract. In the context of the digital transformation of education, there is a growing need for the effective integration of information and communication technologies (ICT) into foreign language teaching. The aim of this study was to identify the pedagogical potential of digital resources and interactive methods in teaching German at the university level. The research was based on an analysis of data obtained during an experimental German language course using digital technologies at J. Balasagyn Kyrgyz National University in the 2024-2025 academic year (sample: 70 students, 4 study groups). The methods employed included a review of scientific literature, synthesis of advanced pedagogical practices, observation, and comparative analysis. The study examined theoretical aspects of contextual learning, computer-mediated communication, and intercultural communication. Digital platforms, multimedia and authentic resources (social networks, YouTube channels, blogs), as well as AI tools – such as chatbots, adaptive applications, and automated assessment services – were analysed. It was found that the use of blended learning technologies enhances student motivation, fosters sustainable foreign language competence, and develops creative skills. Criteria for selecting digital materials based on their linguistic and didactic value were identified, along with examples of their successful implementation. The study demonstrated that combining traditional and innovative approaches improves the quality and effectiveness of German language instruction. The results of this research may be useful for foreign language teachers, methodologists, and educational program developers implementing digital technologies in language teaching at universities and professional development institutions

Keywords: digitalisation of education; interactive technologies; communicative approach; foreign language competence; learning environment; organisation of independent work; multimedia resources

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■ INTRODUCTION

The 21st century has witnessed the rapid development of information technologies, fundamentally transforming approaches to education. These changes are particularly significant in the field of foreign language learning, where digital tools open up new possibilities for enhancing learning efficiency. The growing demand for the German language in academic and professional spheres, especially within the context of international cooperation, necessitates innovative teaching methods capable of accelerating the acquisition of language skills. The specific characteristics of the German language (complex grammar, abundance of compound words, and pronunciation peculiarities) make the use of multimedia resources, interactive platforms, and digital simulations particularly valuable, as they facilitate material comprehension. This shift aligns with the changing educational needs of modern students, who, research indicates, assimilate information more effectively through interactive formats, including video, audio, and gamified elements (Diachuk, 2024).

Contemporary digital technologies are actively transforming the process of foreign language teaching, offering innovative tools and methodologies that enhance material assimilation, student motivation, and teaching quality. In recent years, researchers have paid particular attention to Augmented Reality (AR) and Virtual Reality (VR) technologies, Artificial Intelligence (AI), and Information and Communication Technology (ICT)-based platforms. Yu. Dashko (2023) emphasised the significance of interactive technologies in activating students' learning and cognitive activities. The author noted that such methods promote deeper student engagement in the learning process and the development of their communicative skills. Similar conclusions are presented in the research of Yu. Kazak (2021), focusing on the application of smart technologies in the training of future German language teachers. The author demonstrated that the use of interactive platforms and digital resources allows for the optimisation of the learning process and its adaptation to individual student needs.

A promising direction in contemporary research is the use of augmented and virtual reality technologies. R. Tarasenko *et al.* (2022) found that AR technologies, including QR codes and virtual tours, significantly improve vocabulary retention and stimulate students' oral participation. Comparable results were obtained in the study by V. Kovalenko *et al.* (2021), which proposed a model for integrating AR and VR into blended learning, thereby enhancing the effectiveness of material assimilation at various stages of a lesson. ICT plays a crucial role in modern language education. A. Telnova (2025) noted that virtual classrooms and AI-based platforms ensure a personalised approach to learning and increase student engagement levels. However, despite the evident advantages, teachers' attitudes towards digital tools remain ambivalent. As shown by Y. Fitri & N. Putro (2021), many educators express doubts about the effectiveness of ICT, indicating the need for additional training and methodological support. Similar

conclusions are presented in the work of B. Li (2021), which analysed teachers' readiness to utilise technologies in distance learning contexts.

Particularly interesting is the research by L. Wei & X. Li (2024), dedicated to developing critical thinking through ICT. The authors argued that communicative and constructive tools, including AR and AI, contribute to the formation of students' analytical and evaluative skills. Another promising direction is the integration of chatbots, such as ChatGPT, into the learning process. The study by H. Han *et al.* (2023) confirmed that AI-based platforms effectively improve students' written expression through interactive feedback. Most researchers emphasise that technologies should complement, rather than replace, the teacher, fostering the development of students' investigative and creative activity. The teacher, in this context, remains an inspiring and guiding participant in the educational process. N. Kompanets (2019) highlighted the advantages of modern technologies: the continuity of learning, accessibility of information, and the mobility and autonomy of participants. The author also points to the necessity of developing learners' knowledge, skills, attitudes, and values. A. Martín *et al.* (2019) introduced the term "SMART education" as a reflection of technological progress in learning, while noting, however, insufficient methodological elaboration at the time. Nevertheless, the researchers underscored the potential of technologies for more adaptive and effective learning.

Thus, contemporary research attests to the significant potential of digital technologies in foreign language teaching. However, their successful implementation requires not only technical resources but also appropriate methodological preparation of teachers, as well as the development of strategies considering the specifics of diverse educational contexts. The aim of this article was to analyse the effectiveness of ICT application in teaching German based on an experimental study conducted by the authors in 2024-2025. The work also examined the influence of digital tools on learner motivation, the quality of material assimilation, and the development of key language competencies. The novelty of the research lies in systematising practices for using technologies specifically for the German language, including the adaptation of widely available resources (such as online exercises or podcasts) to its linguistic features.

■ MATERIALS AND METHODS

The study was conducted at Jusup Balasagyn Kyrgyz National University between September 2024 and May 2025. The experiment involved 70 students (4 academic groups) learning German at levels A2-B1 according to the Common European Framework of Reference for Languages (CEFR). To achieve the stated objectives, a complementary set of research methods was employed, including a pedagogical experiment, pedagogical observation, and student questionnaires. The integrated use of these methods ensured the objectivity and reliability of the results obtained.

Participant groups ($n = 70$ students, 4 groups of 17-18 students each) were formed based on stratified sampling, considering the results of an initial placement test to determine German language proficiency level (Goethe-Zertifikat A2/B1 Modellsatz), students' specialisations/departments, and year of study (second year). Prior to the experiment, the groups were statistically equivalent in terms of language proficiency ($p > 0.05$, Student's t -test) and demographic characteristics such as gender and age. The overall sample consisted of 67 female and 3 male participants aged 18-23, with a mean age of 19.8 years in the experimental group (EG) and 20.1 years in the control group (CG). All participants provided informed consent. Anonymity in data processing and the right to withdraw from the study at any time without negative consequences were guaranteed. The study was conducted in accordance with the principles outlined in the Guidance Note of the European Commission on Ethics and Data Protection (2021).

The pedagogical experiment aimed to assess the impact of a specific set of digital technologies on key learning parameters and lasted 8 months (32 academic weeks). In the experimental group (EG, $n = 35$), instruction followed a Blended Learning model, comprising 3 face-to-face sessions per week using traditional methods such as grammar exercises, discussions, and text reading. Additionally, there were 2 asynchronous online sessions per week with mandatory use of assigned digital tools. The integration of digital tasks was directly linked to the topics of the face-to-face sessions. Various digital resources were utilised: for listening – Deutsche Welle (n.d.) (Langsam gesprochene Nachrichten, Video-Thema) and YouTube channels (Easy German, Deutsch lernen mit der DW); for vocabulary and grammar development – Duolingo (n.d.), Quizlet (n.d.) (flashcards, Learn and Match games), Lingvist (n.d.) (adaptive exercises), and Mein Deutschbuch (n.d.) (online exercises); for writing – ChatGPT (n.d.) (GPT-4.0, draft text checking, idea generation) and Grammarly (n.d.) (spelling/punctuation checking); for self-organisation – Notion (n.d.) (vocabulary notebook, note-taking, assignment tracking); for interactive practice – a dedicated Instagram account (posting German-language posts/stories, commenting). It is noted that artificial intelligence tools were used strictly as auxiliary means to optimise processes and are not co-authors of this scientific work; all responsibility for the research design, data collection, analysis and interpretation, and the presented conclusions rests solely with the authors. In the control group (CG, $n = 35$), instruction followed a traditional model with 4 face-to-face sessions per week using standard textbooks (e.g., "Schritte international Neu"), accompanying audio CDs, and printed materials, with minimal use of digital technologies such as the teacher's PowerPoint presentations and access to PDF versions of the textbook.

The following parameters were evaluated during the experiment: language acquisition quality (vocabulary, grammar, listening, speaking), student motivation and engagement, and teaching effectiveness. Language acquisition quality was assessed based on the number of new words

in written work and oral responses, results of vocabulary tests, accuracy in using grammatical structures, as well as test results on comprehension of authentic audio recordings and assessment of monologic and dialogic utterances according to CEFR criteria. Motivation and engagement were measured through class attendance, participation in class activities, time spent on voluntary extracurricular work, and satisfaction with the learning process. Teaching effectiveness was evaluated based on the time spent marking written work, the quantity and quality of personalised feedback, and the teacher's perceived workload.

Pedagogical observation was conducted to assess the process of student interaction with digital resources, identify difficulties, behavioural patterns, and engagement levels. Two EG teachers and one independent methodologist participated in the observation. Prior to observation, a briefing was held, and criteria were agreed upon to minimise subjectivity. Observation took place over 2 months (8 weeks) during the 2nd and 6th months of the experiment, twice a week (16 observation sessions in total). Both laboratory (controlled) settings were used, where students completed tasks with digital resources in a computer lab under observation, and naturalistic settings, involving monitoring student activity within online platforms. A standardised observation protocol was used to record data, including task completion time, number and types of errors, engagement level, emotional reactions, and technical difficulties. Additionally, screenshots, screen recordings (with student consent), and brief field notes from observers were utilised. Processing of observation data involved qualitative content analysis of field notes and protocols, as well as quantitative analysis of error frequency, completion time, and engagement levels.

Student questionnaires aimed to identify subjective perceptions of digital tools, motivation levels, satisfaction with the learning process, as well as technical and methodological difficulties. The questionnaire, developed by the authors and piloted, consisted of four sections: digital literacy and experience using digital tools; evaluation of resource effectiveness (using Likert scales and open-ended questions); motivation and engagement; and difficulties and suggestions. Anonymous online questionnaires (Google Forms) were administered twice: in October 2024 (Wave 1, $n = 70$), focusing on initial motivation and expectations, and in May 2025 (Wave 2, $n = 70$), to assess final experience and satisfaction. Questionnaire data processing included quantitative analysis (frequency analysis, calculation of means, correlations) using SPSS, as well as qualitative analysis of open-ended responses.

For statistical data processing, analysis of variance (ANOVA) for independent samples with Tukey's post-hoc test was used when comparing EG and CG results. Paired t -tests were applied to analyse within-group dynamics, with a significance level of $p < 0.05$. Basic descriptive statistics were calculated. Qualitative analysis included content analysis of observation data, open-ended questionnaire responses, and field notes. To enhance the reliability

of the findings, data triangulation was employed, comparing results obtained from the experiment, observation, and questionnaires. The research information base relied on scientific literature, digital educational resources, multimedia online courses, digital tools, and social networks. The analysis also utilised adapted methodologies for the critical analysis of digital platforms and classification of digital educational resources (Würffel, 2010; Kyrylchuk *et al.*, 2024). Ensuring validity and reliability was achieved through variable control (equating groups by language level, specialisation, use of the same teacher for both groups), objectivity in observation (standardised protocols, involvement of an external observer), guaranteeing anonymity in questionnaires and data processing, and the aforementioned triangulation.

■ RESULTS

Experimental results and conclusions on the effectiveness of digital technologies

Data analysis from the pedagogical experiment demonstrated a significant improvement in the effectiveness of learning in the experimental group (EG) compared to the control group (CG). In the area of vocabulary acquisition, EG students showed an increase of 120 new active words, which exceeds the CG's result by 45 words (overall increase in EG was 75 words higher, $p = 0.008$). In grammar, the accuracy of language structure usage in the EG improved by 41% (error reduction of 41%), substantially outperforming the CG's 18% improvement ($p = 0.001$). In listening

skills, the EG's speech comprehension speed without subtitles increased by 32%, whereas in the CG this indicator rose by only 14% ($p = 0.003$).

In addition to language competencies, there were notable improvements in students' motivation and engagement. Class attendance in the EG reached 93% (compared to 82% in the CG), and the average amount of time dedicated to voluntary extracurricular work was 4.2 hours per week, compared to 1.8 hours in the CG. The use of social media as a learning tool contributed to a 2.3-fold increase in the frequency of German language practice outside the classroom, with 70% of EG students actively participating in such activities. The implementation of digital technologies also positively affected teaching efficiency. The use of artificial intelligence tools, particularly ChatGPT version 4.0, enabled a 50% reduction in the time required for teachers to mark written assignments (from 12 to 7 minutes per student). At the same time, the number of personalised comments on student work increased by 65%, indicating an improvement in the quality of feedback. Based on pedagogical observation and student surveys, key conclusions were drawn regarding the effectiveness of different technologies. The greatest learning progress was observed among students who systematically used an optimal combination of two to three digital tools. Conversely, the use of more than three tools led to fragmented attention and a 12% decrease in average academic improvement. The comparative effectiveness of online resources in learning German is detailed in Table 1.

Table 1. Comparative table of the effectiveness of online resources for learning German

Resource	Strengths	Weaknesses	Usage recommendations
Deutsche Welle	■ authentic materials (news, podcasts); ■ develops listening; ■ adapted speech pace.	■ effectiveness drops without subtitles; ■ risk of mechanical text reading.	■ combine listening with prediction tasks; ■ gradually reduce subtitle dependence.
Duolingo	■ gamification boosts motivation; ■ rapid vocabulary memorisation.	■ repetitive exercises; ■ engagement decreases after 3-4 weeks.	■ use as a supplement to other resources; ■ introduce thematic challenges.
ChatGPT	■ quick grammar checks; ■ help with finding synonyms.	■ errors in cases, verb governance; ■ unnatural stylistic options.	■ use only for draft checking; ■ teach students to critically evaluate corrections.
Instagram	■ informal writing practice; ■ visual support (memes, infographics).	■ low voluntary engagement; ■ distracting content.	■ create closed educational accounts; ■ assign specific tasks (e.g., photo descriptions).
Quizlet Live	■ high engagement in team mode; ■ better memorisation through excitement.	■ dominance by strong students; ■ technical delays.	■ form mixed teams; ■ assign roles (e.g., "checker").
Notion	■ convenient knowledge organisation; ■ collaborative project work.	■ conflicts during simultaneous editing; ■ complexity of template setup.	■ provide training on using the tools; ■ assign roles (moderator, editor).

Source: compiled by the authors

An analysis of the use of various digital tools revealed their specific strengths and limitations. Deutsche Welle proved highly effective for developing listening skills, contributing to a 32% increase in the comprehension of authentic speech. However, without methodological support and with excessive reliance on subtitles, effectiveness declined (60% correct responses without subtitles versus 85% with subtitles), and around 30% of students tended to read

the text mechanically rather than listen actively. It is recommended to combine DW with prediction-based exercises and to gradually reduce reliance on subtitles.

Duolingo proved useful for initial vocabulary acquisition, showing up to a 15% improvement based on observational results. However, student motivation tended to decline after 3-4 weeks due to the repetitive nature of the exercises: 80% of students were actively engaged during

the first 20 days, but 40% later reported fatigue from the platform. This suggests the need to complement Duolingo with more varied educational resources. The ChatGPT tool proved useful in reducing teacher marking time by 30-35%, and in supporting basic grammar understanding and synonym selection. However, limitations were identified: the tool missed approximately 20% of errors related to articles, and 15% of case-related errors. In 18-20% of instances, it provided inaccurate explanations or offered stylistically awkward suggestions. Therefore, ChatGPT should only be used with critical post-checking by a teacher. The Quizlet platform was highly effective for vocabulary retention, particularly due to its gamification elements. For instance, the Quizlet Live mode significantly boosted student engagement, though it required additional teacher oversight to prevent stronger students from dominating and to resolve potential technical issues. Social media, particularly Instagram, proved useful for informal writing practice and visual support. However, relatively low voluntary engagement was observed, and distracting content required more structured tasks to help students stay focused. Notion showed itself to be a valuable tool for organising educational materials and supporting collaborative work. However, its effective use was associated with certain setup challenges and the potential for editing conflicts, which necessitate prior training and clear role distribution among students.

The research findings confirmed the initial hypotheses. Multimedia resources such as Deutsche Welle and YouTube significantly enhanced the perception of authentic speech, as evidenced by a 32% improvement in the experimental group. The use of AI-based tools, including ChatGPT and Grammarly, effectively halved the time required for teachers to mark assignments. Furthermore, interactive methods and gamification (e.g., via Quizlet Live and thematic challenges) led to increased student activity during lessons and a significant rise in extracurricular learning, as reflected by the 93% attendance rate and 4.2 hours of voluntary out-of-class work per week. Observations and surveys also identified several key success factors for integrating digital technologies. Maximum effectiveness was achieved by combining technologies into “clusters” targeted at specific skills. Gradual introduction of new tools, starting with one (e.g., Quizlet), reduced student anxiety and technical barriers, thereby increasing satisfaction and usage frequency. Methodological support – including clear instructions, task strategies, and follow-up discussion or teacher review – was critically important for enhancing the effectiveness of resources, particularly authentic ones like DW or more complex tools like ChatGPT and Notion. Finally, it is essential to develop students’ critical thinking skills so that they can independently and consciously evaluate AI-generated corrections and content from social media.

Recommendations and prospects for the integration of digital technologies in education

Based on a comprehensive analysis of the experimental results, pedagogical observations, and student survey data,

detailed recommendations have been developed for the effective use of digital technologies in the process of teaching German. Particular attention was given to optimising both the quantity and combinations of tools used. The study clearly showed that the greatest academic gains were observed in subgroups of the experimental cohort who systematically used two to three core technologies. Exceeding this number led to cognitive fragmentation and a 12% decrease in average academic improvement.

Examples of effective technology combinations for developing specific language skills include the following. For listening skills, the optimal bundle comprised Deutsche Welle as the core resource, combined with a staged subtitle strategy (content prediction, listening with subtitles, then comprehension testing without them), and brief discussions in Zoom or Teams, leading to a 32% improvement. For vocabulary acquisition, high effectiveness was shown by combining Quizlet or Anki for spaced repetition, contextual vocabulary use via Instagram, and thematic challenges to introduce gamification, resulting in a gain of 120 new words. For writing skills, it is recommended to use AI tools such as ChatGPT or Grammarly for draft proofreading, followed by critical revision by students (cross-checking with grammar rules or teacher review), and then publishing the edited texts on platforms such as Notion, which reduced marking time by 50%. For general language practice, effective tools included YouTube channels, Lingvist for grammar and vocabulary, and Notion for learning material organisation.

A crucial factor is the phased integration of technologies. Observations of 12% of students and survey data indicate that gradual introduction significantly reduces anxiety and technical barriers, enhancing overall satisfaction and frequency of use. Groups in which tools were introduced step-by-step showed better adaptation outcomes. In practice, this means beginning the course with a relatively simple and engaging tool such as Quizlet for vocabulary learning. Once students master its basic use (typically within 1-2 weeks), the next tool (e.g., Deutsche Welle subtitle strategy) can be introduced with clear instructions and skill development tasks at each stage.

Further refinement of target combinations for specific language skills, based on study results and observations, leads to the following set of recommendations:

- **Listening:** use Deutsche Welle with authentic content and a structured subtitle reduction strategy, combined with follow-up interactive discussions in Zoom or Teams to consolidate material and practise speaking;

- **Vocabulary:** systematic memorisation via Quizlet/Anki, contextualisation of vocabulary through social media (e.g., Instagram posts, comments), and gamification via thematic challenges;

- **Writing:** use AI tools for initial drafts, encourage students to critically revise corrections (check with rules), followed by teacher feedback and practical application via text publishing on digital platforms;

- **Grammar:** use specialised platforms (Lingvist, DW exercises), reinforce grammatical structures contextually in

writing/speaking, followed by AI/teacher correction and clear rule explanations:

■ **Speaking:** use authentic videos/podcasts (YouTube, DW) as models, imitation exercises, and interactive formats such as discussions and role-plays.

Successful implementation also requires adequate technical preparation, including regular training sessions for both students and instructors, especially for more complex tools such as Notion or prompt engineering in ChatGPT. It is important to note that approximately 12% of students require additional support. Special attention must be paid to teaching students critical analysis skills when using ChatGPT corrections, including cross-referencing with textbooks and grammar guides, and cautioning against relying solely on AI when preparing for high-stakes assessments. A stable internet infrastructure and access to appropriate devices are essential. Ongoing monitoring and feedback collection, such as via surveys, are recommended to promptly identify technical or methodological issues and to evaluate the effectiveness of any corrective measures.

At the same time, certain limitations must be acknowledged. Successful integration of digital tools requires stable internet access, and some students will require more structured support and guidance. The effectiveness of AI tools – particularly ChatGPT – in correcting complex grammar (e.g., articles and case endings) remains limited. Future development in this area should focus on the creation of adaptive AI trainers for challenging grammatical topics, testing of VR simulations for immersive speaking practice, and the design of integrated platforms that combine the strengths of different digital tools to support comprehensive language learning.

■ DISCUSSION

The findings of this study expand the empirical base regarding the effectiveness of integrating digital technologies into university-level German language teaching. The observed improvements in vocabulary, grammar, and comprehension of authentic speech in the experimental group are consistent with broader trends in contemporary language didactics, where digital resources are increasingly recognised as powerful catalysts for language development (Mizza & Rubio, 2024). Scholars such as G. Hogan-Brun & R. Whittle (1997), A. Zhamaliyeva & G. Shaimerdenova (2021), and M. Teng (2022) emphasised the potential of multimedia tools in accelerating language acquisition, especially in listening and vocabulary building. The positive impact of digital tools on student motivation and engagement – reflected in increased attendance and time spent on extracurricular learning – aligns with findings from other studies on gamification and interactive teaching methods (Arkabayev *et al.*, 2023; Xiao & Hew, 2024). Researchers like M. Alshiha & A. Al-Abdullatif (2024), and M. Jun & T. Lucas (2024) have noted that gamified elements and personalised approaches help foster sustained interest in the subject and encourage greater learner participation. This is particularly

relevant in contexts that require self-directed learning and a high degree of organisation.

Data from this study concerning increased teaching efficiency through AI-based tools in assignment marking are also reflected in recent academic literature. Several authors explore how AI tools can automate routine tasks, allowing educators to focus on more complex feedback and personalised instruction (Onet, 2025; Tan *et al.*, 2025). However, identified limitations regarding grammatical accuracy and stylistic naturalness in ChatGPT outputs highlight the need for a critical approach and continued oversight by instructors. These concerns are echoed in scholarly discourse discussing the reliability and pedagogical soundness of fully delegating assessment tasks to AI (Ramírez *et al.*, 2024; Ocen *et al.*, 2025).

The study also established optimal quantities and combinations of digital tools for maximum learning outcomes. The finding that excessive use of digital tools can lead to attention fragmentation and lower performance is significant. This supports cognitive load theory, which warns against information and tool overload, both of which can negatively affect the learning process (Gerlich, 2025). Thus, a balanced approach to tool selection and integration becomes a critical success factor. Particularly noteworthy are the observations on phased integration of tools and its positive impact on student anxiety reduction and satisfaction – an approach supported by findings in pedagogical psychology that highlight how gradual adaptation promotes confidence and reduces barriers (Alkhawaja *et al.*, 2021; Puente-Torre *et al.*, 2025). This is especially pertinent given varying levels of digital literacy among students.

Overall, the findings confirm that digital technologies hold considerable potential to transform foreign language education. However, successful integration requires not only access to modern tools, but also a deep understanding of their pedagogical affordances and limitations, as well as a carefully considered implementation strategy and ongoing methodological support. The development of students' critical thinking – particularly in relation to AI-generated content and open-source information – is also frequently cited in research on media literacy and digital competence. As studies show, the ability to evaluate and analyse information is becoming one of the most essential skills in the era of digital education.

■ CONCLUSIONS

The pedagogical experiment statistically confirmed ($p < 0.05$) the significant benefits of systematically integrating digital technologies – including multimedia, AI tools, social media, and interactive platforms – into the process of learning German. The study demonstrated marked improvements in students' language skills: in the experimental group, active vocabulary increased by 120 words, grammatical accuracy improved by 41%, and listening speed without subtitles rose by 32%. Moreover, there was a notable increase in learner motivation and engagement, with attendance reaching 93% and voluntary extracurricular

learning time rising to 4.2 hours per week. Teaching efficiency also improved, as evidenced by a 50% reduction in assignment marking time due to AI tools.

The key success factor was not merely the introduction of digital tools, but their methodologically sound combination. The optimal use of 2-3 complementary tools, phased integration with appropriate methodological support, and targeted application to specific language skills proved most effective. Particular emphasis should be placed on fostering a critical mindset among students – especially when working with AI tools – since their capabilities remain limited. The recommendations offered, grounded in empirical data, provide a practical roadmap for the effective digitalisation of the teaching process. The study therefore confirmed that a well-balanced blend of innovative technologies and proven traditional teaching methods ensures sustainable

development of language competencies. Further work should focus on fine-tuning digital solutions and developing adaptive AI trainers that consider both pedagogical and psychological aspects of foreign language learning.

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Аннотация. Билим берүүнүн санариптик трансформациясы шартында, чет тилдерди үйрөтүү процессинде маалыматтык-коммуникациялык технологияларды (МКТ) натыйжалуу интеграциялоого муктаждык күчөөдө. Бул изилдөөнүн максаты: Жогорку окуу жайында немис тилин үйрөтүүдө санариптик ресурстардын жана интерактивдүү ыкмалардын педагогикалык мүмкүнчүлүктөрүн аныктоо. Изилдөө 2024-2025-окуу жылында Ж. Баласагын атындагы Кыргыз улуттук университетинде немис тилин санариптик технологияларды колдонуп эксперименталдык түрдө үйрөтүү убагында алынган маалыматтарды талдоого негизделген (70 студент, 4 окуу тобу тандалып алынды). Методдор катары илимий адабияттарды талдоо, алдыңкы педагогикалык тажрыйбаны жалпылоо, байкоо жана салыштырмалуу талдоо колдонулган. Иш жүзүндө контексттик окутуунун, компьютер аркылуу жана маданияттар аралык коммуникациянын теориялык аспектери изилденген. Санариптик платформалар, мультимедиялык жана аутентикалык ресурстар (социалдык тармактар, YouTube-каналдар, блогдор), ошондой эле ЖИ-куралдары – чат-боттор, адаптивдүү колдонмолор жана автоматтык текшерүү сервистерин анализденген. Аралаш окутуу технологияларын колдонуу студенттердин мотивациясын жогорулатууга, туруктуу чет тилдик компетенттүүлүктү калыптандырууга жана чыгармачыл жөндөмдөрдү өнүктүрүүгө көмөк берет деген жыйынтыкка келинди. Санариптик материалдарды тандоонун лингводидактикалык маанисин эске алган критерийлери аныкталып, аларды ийгиликтүү киргизүүнүн мисалдары келтирилген. Салттуу жана инновациялык ыкмаларды айкалыштыруу немис тилин үйрөтүүнүн сапатын жана натыйжалуулугун жогорулатат деп көрсөтүлгөн. Изилдөөнүн жыйынтыктары чет тилдердин мугалимдери, методисттер жана ЖОЖдордо жана квалификацияны жогорулатуу системасында санариптик технологияларды тил үйрөтүү практикасына киргизүүчү билим берүү программаларды иштеп чыгуучулар үчүн пайдалуу болушу мүмкүн.

Негизги сөздөр: билим берүүнүн санариптешүүсү; интерактивдүү технологиялар; коммуникативдик ыкма; чет тилдик компетенттүүлүк; окутуу чөйрөсү; өз алдынча ишти уюштуруу; мультимедиялык ресурстар

Современные тренды в изучении немецкого языка: применение технологий и интерактивных методов

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Аннотация. В условиях цифровой трансформации образования возрастает потребность в эффективной интеграции информационно-коммуникационных технологий (ИКТ) в процессе обучения иностранным языкам. Цель настоящего исследования – выявить педагогические возможности цифровых ресурсов и интерактивных методов при обучении немецкому языку в вузе. Исследование основано на анализе данных, полученных в ходе экспериментального преподавания немецкого языка с применением цифровых технологий в Кыргызском национальном университете им. Ж. Баласагына в 2024-2025 учебном году (выборка: 70 студентов, 4 учебные группы). В качестве методов были использованы анализ научной литературы, обобщение передового педагогического опыта, наблюдение и сравнительный анализ. В ходе работы изучены теоретические аспекты контекстного обучения, компьютерно-опосредованной и межкультурной коммуникации. Проанализированы цифровые платформы, мультимедийные и аутентичные ресурсы (социальные сети, YouTube-каналы, блоги), а также применение ИИ-инструментов – чат-ботов, адаптивных приложений и сервисов автоматической проверки. Установлено, что использование технологий смешанного обучения способствует повышению мотивации студентов, формированию устойчивой иноязычной компетентности и развитию творческих способностей. Выявлены критерии отбора цифровых материалов с учетом их лингводидактической ценности и приведены примеры их эффективного внедрения. Показано, что сочетание традиционных и инновационных подходов повышает качество и результативность обучения немецкому языку. Результаты исследования могут быть полезны преподавателям иностранных языков, методистам и разработчикам образовательных программ, внедряющим цифровые технологии в практику языкового обучения в вузах и системе повышения квалификации

Ключевые слова: цифровизация образования; интерактивные технологии; коммуникативный подход; иноязычная компетентность; обучающая среда; организация самостоятельной работы; мультимедийные ресурсы



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Features of interdisciplinary integration in the formation of future teachers' linguodidactic competence

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Abstract. Modern challenges in the system of pedagogical education require the introduction of innovative approaches to the formation of linguodidactic competence of future teachers. The aim of this article was to identify the features and potential of interdisciplinary integration in the process of forming linguodidactic competence on the basis of integrated educational technologies. The paper used the methods of theoretical analysis of scientific literature, comparison, contrast, synthesis, systematisation, as well as empirical methods, including observation, questionnaires, testing, survey, interview and pedagogical experiment. Based on the results of the study, the content aspects of interdisciplinary integration in teacher training were identified. The possibilities of CLIL (Content and Language Integrated Learning) technology as an effective means of integrating language and professional education were analysed. The experimental study, conducted on the basis of the Jusup Balasagyn Kyrgyz National University, showed a significant improvement in the indicators of linguodidactic competence in the experimental group. Thus, if before the experiment a high level of competence was demonstrated by 10% of students, after the introduction of the program based on CLIL this indicator increased to 70%. At the same time, the share of students with a low level of competence decreased from 60% to 0%. No such significant changes were observed in the control group. It was found that the use of CLIL contributes to the development of critical thinking, language and communication skills of students, as well as strengthening their intercultural competence. Interdisciplinary integration contributes to deeper learning of educational material, activation of students' cognitive activity and increasing their interest in learning. The practical significance of the study lies in the fact that the obtained results can be used in the development of integrative training courses and methodological materials in higher education institutions for the purpose of effective formation of linguodidactic competence of future teachers

Keywords: pedagogical education; integrated educational technologies; CLIL; language education; professional training; critical thinking; communication skills

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■ INTRODUCTION

The educational space of the 21st century is characterised by globalisation, digitalisation and innovative changes. The transformation of content, technologies and learning objectives, especially in the higher professional education system, has placed new demands on education. The modern development of the education system requires future teachers to have comprehensive competencies (Kartashova & Plish, 2020). The formation of linguistic and didactic competence, especially in the processes of language teaching and education through language, remains a key issue for students of the teaching profession. In this context, interdisciplinary integration is seen as an important mechanism for updating the content, methods and technologies of education. There are a number of serious contradictions in the formation of the linguistic and didactic competence of future teachers. For example, higher professional education programmes do not place sufficient emphasis on the development of language teaching competencies. As a result, the integration of subject knowledge and language skills among students remains insufficient in the process of language learning. In addition, the modern educational paradigm requires a competency-based approach and aims at the comprehensive development of students' functional, cultural and language skills. However, despite these requirements, in most educational organisations, interdisciplinary integration is not fully implemented in the educational process. Although the potential of integrative technologies, such as CLIL (Content and Language Integrated Learning), especially in teacher training programmes, is widely known, the methodological and methodological support for their practical implementation remains insufficient.

Furthermore, although the structure of linguistic competence has been studied at the theoretical level and its main components have been identified, the mechanisms for forming these components in interdisciplinary relations have not always been clearly worked out. In practice, work in this area requires special training for teachers. However, in real-life conditions, many teachers, despite deep specialisation in the field, do not always possess the didactic and methodological skills necessary for the implementation of integrated teaching. Furthermore, despite the great potential for interdisciplinary integration in education, the methodological support, material and technical base, and teaching resources necessary for its effective implementation are insufficiently developed. This circumstance, in turn, negatively affects the process of forming linguistic and didactic competence and reduces its effectiveness. These and other contradictions necessitate a review of the educational model aimed at developing linguistic and didactic competence, its updating in line with modern requirements, and the systematic introduction of integrative teaching technologies.

In defining the theoretical and methodological foundations of professional competence, Z. Yakimova & V. Nikolaeva (2012) justified the need to improve the quality of higher education and adapt to the labour market by creating effective models for assessing competencies in the

education system. O. Romanova (2012) worked out a model for the formation of professional competence of a teacher, clearly defining its structural components and stages. The use of the model allows for the systematic improvement of the professional training of future teachers. As noted by A. Raimkulova (2016), the period of study at a university is a particularly important stage in the formation of a student's character, level of intelligence, worldview, and professional position. During this period, students change their value system and develop a professionally oriented self-concept. I. Matviienko (2022) paid particular attention to the development of critical thinking skills. E. Ibragimova & Z. Medzhitova (2019) examined the development of listening skills in primary school students through joint teaching of Russian and Crimean Tatar languages in the formation of interlingual integration and bilingual listening skills in primary grades. This demonstrates the effectiveness of integrating language lessons. With regard to the development of research competence through project technology, A. Golovchun (2021) analysed the methodology of using project activities in the development of research skills among foreign language teachers. The criteria for assessment and practical recommendations are also provided here.

Also, regarding the impact of CLIL technology on professional competence, M. Nartayeva *et al.* (2024) studied the development of professional competence among biology teachers using CLIL technology in a trilingual education setting. The formation of linguistic and language competences in a bilingual environment B. Dzusova & M. Slanova (2021) investigated the formation of language and linguistic skills of students in a multilingual environment. The study focused on the development of speaking and thinking skills. On the development of language teaching competence on an interactive basis N. Rubina (2012) proposed a methodology for developing the language teaching skills of foreign language teachers through interactive technologies M. Igolkina & V. Yazynina (2024) analysed the effectiveness of combining foreign language lessons with subjects in universities where foreign languages are not taught.

As shown by an analysis of scientific and pedagogical literature, the formation of future teachers' linguistic competence is a combination of long-term processes requiring a comprehensive approach. In the current case, language disciplines were integrated with subjects such as pedagogy, psychology, didactics, methodology, etc., providing a combination of theoretical knowledge and practical skills for students. By organising the content of education on an interdisciplinary basis, students perceived knowledge not in isolation, but in a coherent and contextual manner. This approach included not only language learning, but also communicative, cultural and didactic components. Taking into account linguistic and intercultural aspects in foreign language teaching is of particular importance in the practical work of future teachers. The authors of this study considered linguistic competence as a unified system of theoretical and practical training for future language teachers. It ensures the ability to communicate interpersonally

and interculturally. Interdisciplinary integration plays a special role in the development of this component. It provides conditions for effective, functional and contextual acquisition of knowledge by combining the content of several disciplines. The aim of the article was to provide a theoretical justification for the features of interdisciplinary integration in the formation of the linguistic competence of future teachers. Objectives: to analyse the concept of linguistic and didactic competence; to determine the place of interdisciplinary integration in the educational process.

■ MATERIALS AND METHODS

This study used experimental methods to evaluate the effectiveness of CLIL technology in developing the linguistic and pedagogical competence of future teachers. The theoretical basis of the study was scientific and methodological literature on pedagogy, linguistics and interdisciplinary integration. Scientific works on educational practice in Kyrgyzstan and foreign countries, internal training programmes of the Institute of Social Sciences and Humanities of the Jusup Balasagyn Kyrgyz National University and the Faculty of Kyrgyz Philology, as well as materials from practical classes were used as a reference base. During the study, the following general scientific methods of cognition were used: observation, questionnaires, testing, surveys, interviews, pedagogical experiments, and expert assessment. These methods were chosen because of the need for an objective comparison of the initial and final states of students' linguistic and didactic competence. For example, observation and questionnaires were used to determine students' attitudes towards learning, their interest in studying the language, and their independent work skills. Tests and control tasks made it possible to assess students' foreign language proficiency and subject knowledge. In-depth information was obtained through interviews and diagnostic seminars, and the results were subjected to qualitative analysis.

The study was organised in two main stages: assessment and development. The first stage involved assessing the students' initial level of knowledge and skills, as well as identifying discrepancies between the content of language training and professional profiles. In the second stage, a special educational programme was worked out, including elements of CLIL technology, which was tested in groups PiP-1-24 and KTA-2-24. This programme consisted of 8 academic hours, in which English-language texts on educational organisations, culture and pedagogical concepts were used. Methodological models developed by other authors were used as a conceptual basis, in particular, integration models based on CLIL technology (Marsh, 2012). An adapted version of these models, adapted to the Kyrgyz reality, was worked out in the methodological base of the study. Regulations for the Training of Students of the Jusup Balasagyn Kyrgyz National University (2023) and testing criteria were also used.

The results of the study were based on empirical data – student responses, analysis of practical work and test scores. Students' knowledge levels were divided into three

categories, and their level of competence in CLIL technology was assessed relatively. High level – students are characterised by a deep interest in the profession, methodological knowledge, sufficient training in the principles of humane teaching and the ability to creatively apply knowledge in practice; good knowledge of foreign languages and the ability to communicate interculturally. Average level – interest and knowledge in the profession are at an average level, the ability to analyse linguistic and pedagogical issues is limited, they cannot fully demonstrate their competence in pedagogical situations; average level of foreign language proficiency. Low level – insufficient interest and knowledge in the professional field, difficulties in mastering linguistic and didactic issues; low level of proficiency in English and additional languages.

The study was conducted in the 2024/25 academic year at the Jusup Balasagyn Kyrgyz National University with the participation of 40 first- and second-year students, divided into control and experimental groups of 20 people each. Participants were selected using stratified randomisation, taking into account age (average age 19.5 years), initial level of English proficiency (CERF: A2-B1) and gender composition (65% women, 35% men). To ensure ethical correctness, all participants signed an informed consent form, and their data were anonymised by assigning identification codes (S1-S40). The study complied with the principles of the World Medical Association Declaration of Helsinki (2013) and the internal ethical code of KNU. The experiment was based on a quasi-experimental design with a pretest-posttest scheme and lasted 4 weeks (8 academic hours). The independent variable was the use of CLIL technology, and the dependent variable was the level of linguistic and didactic competence, assessed on a three-point scale (low, medium, high). Data was collected using author-developed tests adapted to CERF criteria and KNU-2023 intra-university standards, as well as a 5-point Likert scale questionnaire (α -Cronbach = 0.78) and structured observation with results recorded every 15 minutes. Statistical data processing was performed using SPSS 26.0. Descriptive statistics (mean values, percentages), Student's t-test for group comparison, and correlation analysis (Pearson's coefficient) were used to identify correlations. The results confirmed the statistical significance of the differences between the control and experimental groups ($p < 0.05$), which indicated the effectiveness of the CLIL methodology.

■ RESULTS AND DISCUSSION

Theoretical foundations for the development of linguistic competence in modern conditions

Transformations in the education system require every student – a future teacher – to develop a high level of competence, primarily in language teaching. In this regard, it is essential to develop and use innovative teaching technologies based on interdisciplinary integration. At the same time, the learning process in educational institutions must be purposefully organised and have a specific methodological and content-based foundation. Education KR State

Educational Standard of Higher Professional Education. Direction: 550700 Pedagogy. Qualification: Bachelor's Degree (2021) When analysing the following competencies that influence the formation of future teachers' linguistic and pedagogical competence, the following were identified: instrumental (IK): IK-1. Able to communicate effectively in one of the state, official and foreign languages in the field of work and education. Consequently, this competence can be defined as the linguistic and pedagogical competence of future teachers. Linguistic and pedagogical competence is an integrated system of knowledge, skills, methods and experience in the field of language and theory in higher professional education. It is aimed at providing linguistic and methodological training for future teachers, the effective use of language in the educational process, and the development of the ability to achieve pedagogical goals through language.

In developing the linguistic and pedagogical competence of future teachers, interdisciplinary integration is an educational strategy that ensures the interconnection of various disciplines and creates conditions for complex thinking. It develops the analytical and systematic thinking of future teachers. For example, combining foreign language lessons with pedagogy deepens students' linguistic and subject-specific understanding. Interdisciplinary connections enable students to master the language in a subject-specific context. This helps students develop the ability to argue lexically and terminologically, strengthening the connection between language and thinking.

The CLIL method is being introduced into higher education programmes in response to the labour market's need for specialists who are fluent in a foreign language and able to communicate effectively in an international professional and academic environment (Nguyen *et al.*, 2025). Teaching a specific subject in a foreign language using the CLIL method has a number of features (Dack *et al.*, 2020). These include: increased cognitive demands on students; regulation of requirements; effective organisation of students' learning activities; ensuring the connection between language and subject. These features are considered one of the main components of a teacher's professional competence in the context of content and language integrated learning. Educational programmes delivered in foreign languages are one of the competitive advantages of universities, determining their leading positions in global rankings. These programmes are focused on global educational and research areas and are aimed at training specialists capable of working in international scientific and professional communities. Teaching in such programmes is mainly conducted in one of the international languages, most often English, and teachers must be competent not only in the subject but also in the foreign language and apply the method of integrated teaching based on the subject and language (Content Based Instruction) or CLIL. This means that in order to use this methodology effectively in higher education programmes, it is also necessary to master its basic principles. Educational programmes delivered in

foreign languages are one of the competitive advantages of higher education programmes, determining their leading positions in global rankings. These programmes are oriented towards global educational and research directions and aim to prepare specialists capable of working in international scientific and professional communities. Instruction in such programmes is predominantly conducted in one of the international languages, most often English, and the instructor must possess competencies not only in the subject matter but also in the foreign language, applying the method of integrated instruction based on content and language (Content Based Instruction) or CLIL (Content and Language Integrated Learning). This means that for the effective use of this methodology in higher education programmes, it is also necessary to be familiar with its fundamental principles.

In the theory of foreign language learning, the concept of CLIL was proposed by researcher D. Marsh (2012) in the mid-1990s. This methodology is understood as a learning process that encompasses two directions: the first being a foreign language, and the second being a subject area (for example, pedagogy, psychology, history, philosophy, etc.) used as a medium for instruction. In other words, in this methodology, the learner not only acquires a foreign language but also learns the content of a specific scientific or academic discipline in that language. According to L. Khalyapina (2017), content is defined as "a set of theoretical knowledge and skills that determines the subject being studied, its goals, objectives, and related issues; that is, a collection of theoretical knowledge and skills that enables one to express accurate professional views and opinions in the field of the topics being studied."

In the formation of the linguodidactic competence of future teachers, interdisciplinary integration represents an educational strategy that ensures the interconnection of various disciplines and creates conditions for holistic thinking. It develops the analytical and systemic thinking of future teachers. For example, the combination of a foreign language lesson with pedagogy deepens the linguistic and subject understanding of the learner. Through interdisciplinary connections, students acquire the language within a subject context. This contributes to the formation of lexical and terminological speech in the learner and strengthens the link between language and thought (Kazazoglu, 2025). In summary, the aim of Content and Language Integrated Learning is to acquire knowledge and improve skills in a specific subject, while also enhancing language-related knowledge and skills during the study of that subject. The objectives of the CLIL methodology have been clarified by D. Coyle (2007) and explained in terms of four key components – 4C (Table 1).

Among researchers studying the theoretical and practical aspects of Content and Language Integrated Learning (CLIL), the work of E. Melekhina (2021) hold a significant place. In the author's view, there are several features that contribute to the effective implementation of this methodology. The first feature is the universality of learning. The CLIL approach considers language acquisition not as

an independent subject but in connection with other subject knowledge. The learning process, alongside the enhancement of language skills and abilities, facilitates the understanding of subject content in a foreign language. Furthermore, through the integration of multiple subjects, students develop functional literacy, as well as analytical and critical thinking skills. The educational process is also organised through intercultural projects, and students are engaged in reflecting on their learning activities. The second feature is the creation of a stimulating educational environment. The use of repetitive types of activities and discourses during lessons, as well as the full utilisation of the foreign language throughout the lessons, enhances students' confidence in the language and boosts their motivation. In such conditions, the language and subject matter are acquired mutually, with the language being used as a real means of communication. Thirdly, a light and comfortable environment for the learning process is created. The classroom facilities allow students to work freely in pairs or small groups. Access to resources is provided, and the individual needs and interests of students are taken into account during the language learning process, which contributes to the improvement of their language skills. The fourth feature is the provision of support and consideration of students' needs. In the event of language barriers arising during the learning process, students have the opportunity to seek assistance. Their interests, needs, and life experiences are always considered. Additionally, students are provided with opportunities to communicate with representatives of

other cultures and study subjects together in a foreign language. Lessons utilise materials from mass media, online sources, and other relevant information. The fifth characteristic is active learning. In CLIL lessons, students speak more than the teacher. They actively participate in setting learning objectives and assessing their achievements. Throughout the lesson, language resources and concepts are discussed collaboratively. The predominant format is pair work or small group activities. Teachers act not as traditional educators but as facilitators – supporting and guiding students. The sixth characteristic is developmental learning. The learning process is structured taking into account students' prior knowledge, skills, experiences, and interests. New information is presented in a clear and accessible manner. Various learning strategies are employed, fostering creativity and critical thinking among students. Students are encouraged to step out of their “comfort zone” and achieve new successes. The seventh characteristic is collaborative activity. In the effective implementation of the CLIL methodology, the cooperation between language and subject teachers holds particular significance. Teachers collaboratively plan lessons and courses, closely interacting with stakeholders (parents, administration, community organisations, etc.) to achieve common goals. The aforementioned characteristics affirm the multifaceted and systematic nature of the CLIL methodology and provide grounds for considering it an innovative technology aimed at integrating language and subject matter in higher pedagogical education.

Table 1. 4C model components

No.	4C components	Criterion
1	Communication	The level of proficiency in the foreign language being studied increases, communication skills are developed in all disciplines in the context of subject-language integrated learning, and individual types of speech acts are improved (listening, speaking, reading, writing).
2	Content	Developing skills through subject matter study, application of new knowledge and practical assignments.
3	Culture	To broaden understanding and deepen knowledge about cultures in interaction.
4	Cognition	Development of thinking; subject content, language skills and abilities are consistent with the existing knowledge, experience and needs of students. Students analyse their learning activities, synthesise new knowledge based on knowledge obtained in the course of studying various subjects, and apply it in practice.

Source: compiled by the authors based on D. Coyle (2007)

The pedagogical opportunities of CLIL technology hold particular significance for the development of students' foreign language communication skills and for increasing their interest in the subject being studied. In this approach, the foreign language is primarily used as a tool for discussing the subject content. This, in turn, promotes a deeper understanding of the subject and activates a type of speech activity known as “speaking” (Jiang *et al.*, 2022; Sudarso *et al.*, 2024). Under these conditions, students learn to express their thoughts clearly and fluently in a foreign language, resulting in increased language activity and the ability to adhere to language norms. D. Short (1994) asserts that “the CLIL approach contributes to an improved psychological climate in the classroom where the learning process occurs. It fosters a positive attitude among students towards native speakers of the foreign language and their

cultures, leading to increased motivation through interest in what is happening in the lesson.”

It can be confidently stated that CLIL is one of the most effective methods for developing linguistic-didactic competence. The essence of this method lies in the simultaneous development of language and subject competence through the teaching of subject content in a foreign language. In this approach, the foreign language, unlike traditional language study, is used not only as a means of communication but also as a tool for acquiring knowledge. The value of this approach for future teachers lies in its ability to develop their professional and linguistic training on a unified basis. The CLIL methodology serves as an important platform for implementing interdisciplinary integration, as it necessitates the interaction of various professional disciplines such as pedagogy, psychology, linguistics, and

others. Linguodidactic competence, in turn, is characterised by the future teacher's ability to select linguistic resources in accordance with the content of foreign language instruction, present material using linguistic means, and organise students' linguistic activities.

Results of the empirical study of linguodidactic competence

The results of the level of linguodidactic competence of students in the experimental and control groups before the start of the experiment are presented in Table 2.

Table 2. Distribution of students into experimental and control groups

J. Balasagyn Kyrgyz National University	Total quantity	Low		Average		Higher	
		quantity	%	quantity	%	quantity	%
Experimental	20	12	60	6	30	2	10
Control	20	15	75	4	20	1	5

Source: compiled by the authors

As can be seen from Table 2, the initial knowledge of students in both the control and experimental groups is at the same level. Among them, 60-75% demonstrate a medium to low level of language didactic competence. The level

of development of students' language didactic competence following the pedagogical experiment is presented in Table 3, while the indicators of the development of students' language didactic competence are shown in Figure 1.

Table 3. The level of development of students' linguodidactic competence after the pedagogical experiment

J. Balasagyn Kyrgyz National University	Total quantity	Low		Average		Higher	
		quantity	%	quantity	%	quantity	%
Experimental	20	0	0	6	30	14	70
Control	20	4	20	14	70	2	10

Source: compiled by the authors

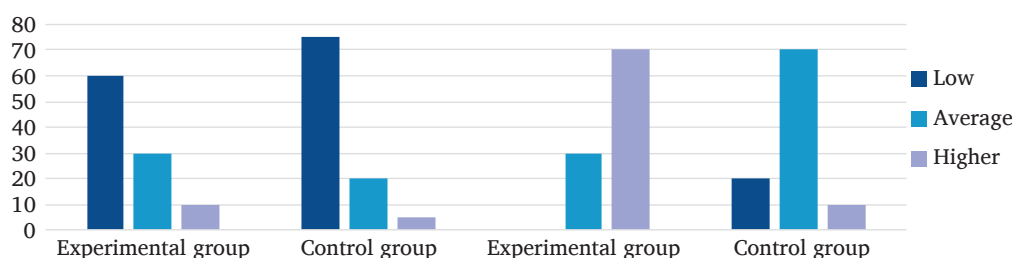


Figure 1. Indicator of the development of students' linguodidactic competence

Source: compiled by the authors

Analysing the results obtained during the experiment, it can be noted that the level of linguodidactic competence among the majority of students, who are future teachers, has significantly increased. For instance, in the current pilot experiment, the proportion of future teachers who received good grades in the experimental groups was 10%, whereas after the experiment, this figure rose to 70%. A similar increase was observed among the students in the control group. However, the level of linguodidactic competence among students in the experimental group was significantly higher than that of students in the control group. A similar increase was also observed among the students in the control group. Thanks to new educational technologies, modular assessments, examinations, and coursework in groups have proven to be effective. During the experimental learning, there was a noticeable development of students' cognitive engagement, along with a positive motivation towards the subject and their future profession. As a result, it was found that students demonstrate a creative approach to their work. Future teachers more frequently

consulted the instructor during their tasks, leading to a dialogue of Teacher + Student = Professional Relationship.

The question of achieving the maximum possible efficiency of experimental learning during pedagogical experimentation remains open; however, it can be noted that the results of the learning process approach the level that students can realistically achieve. As stated by D. Scott & S. Beadle (2014), for the effective development of linguistic-didactic competence in future teachers when using CLIL methodology, subject teachers should select methods that take into account language difficulties and cognitive load. If the teacher is a specialist without linguistic training, they must anticipate the obstacles that students may encounter through pedagogical reflection and strive to ensure a balance between the content of learning and the language tools used (Assanova *et al.*, 2024).

Thus, for the successful implementation of CLIL in higher education programmes, instructors are required not only to have a thorough understanding of the subject matter and a necessary level of proficiency in a foreign

language as a means of communication, but also to set realistic objectives. These objectives should be determined with consideration of the students' levels of subject and language proficiency (ÓLaoire, 2006). Furthermore, when selecting the content for instruction, educators must adhere to the fundamental principles of the CLIL methodology. In particular, it is essential to take into account the cognitive demands placed on students when learning the subject through foreign language resources, as well as whether their level of language proficiency is sufficient to accomplish the set tasks (Blázquez et al., 2013).

In the process of developing the linguodidactic competence of future teachers, it is essential to identify the difficulties that students encounter and to respond to them promptly and flexibly. To achieve this, it is necessary to effectively utilise “auxiliary” forms that facilitate understanding of the language and the content of the educational material, as well as to make efficient use of a variety of teaching resources – from graphic organisers to multimodal educational texts. Therefore, the implementation of the CLIL approach within the framework of interdisciplinary integration not only enhances the subject-language preparation of future teachers but also fosters a comprehensive linguodidactic competence that enables flexible pedagogical decision-making during the learning process. The use of the CLIL approach in the training of future teachers is particularly significant as a modern and comprehensive method for developing linguodidactic competence based on interdisciplinary integration.

■ CONCLUSIONS

In the formation of linguistic and didactic competence for future teachers, interdisciplinary integration, particularly the use of CLIL technology, is an effective approach that meets the demands of modern education. It creates conditions for mastering educational content and language through interaction, while simultaneously developing students' subject knowledge and their ability to communicate in a foreign language. Such integration requires educators to possess a high level of pedagogical reflection, foresight regarding potential difficulties in mastering content and language, and the ability to develop flexible teaching strategies. As demonstrated by the results of the conducted research, interdisciplinary integration, particularly the use of CLIL technology, is an effective didactic method in forming the linguistic and didactic competence of future teachers, aligning with the requirements of contemporary education systems. Integrated learning establishes conditions for the mastery of language and subject content as a unified system, while concurrently fostering students' linguistic, communicative, and subject-specific competencies. The research established that the use of the CLIL technology

contributes to the improvement of foreign language proficiency, the maintenance of language competence, and the deepening of subject knowledge among students. This technology also enhances motivation towards the learning process, deepens intercultural understanding, and activates cognitive engagement. Practical results of the study demonstrated its suitability for use in the development of educational and methodological complexes and integrative courses based on interdisciplinary integration. It is recommended to widely employ teaching forms that integrate language and subject matter in higher education programmes for teacher training. The CLIL technology fosters the development of professional and general competencies in future teachers, providing opportunities to update teaching in substantive, linguistic, and cultural aspects.

This methodology facilitates the integration of higher education institutions into the international arena, promotes academic mobility among students, and encourages the exchange of professional experiences. Thus, subject-language integration based on the CLIL approach will enhance the methodological training of future educators, developing their ability for independent work and scientific thinking. Further research in this area may focus on the development and testing of more detailed criteria and assessment tools for evaluating the formation of linguistic-didactic competence at various stages of education, which will allow for a more accurate monitoring of students' developmental dynamics.

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■ CONFLICT OF INTEREST

The authors declare that they have no financial, academic, or personal conflicts of interest related to the data and results of the research presented in this article.

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Болочок мугалимдердин лингводидактикалык компетенттүүлүгүн калыптандырууда предметтер аралык интеграциянын өзгөчөлүктөрү

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Аннотация. Педагогикалык билим берүү системасындагы заманбап талаптар келечектеги мугалимдердин лингводидактикалык компетенттүүлүгүн калыптандырууга инновациялык ыкмаларды киргизүүнү талап кылат. Бул макаланын максаты интеграцияланган билим берүү технологияларынын негизинде лингводидактикалык компетенцияны калыптандыруу процессинде дисциплиналар аралык интеграциянын өзгөчөлүктөрүн жана потенциалын аныктоо болгон. Иште илимий адабияттарды теориялык талдоо, салыштыруу, айкалыштыруу, синтездөө, системалаштыруу ыкмалары, ошондой эле эмпирикалык ыкмалар, анын ичинде байкоо, анкета, тестирлөө, сурамжылоо, интервью жана педагогикалык эксперимент колдонулган. Изилдөөнүн жыйынтыгы боюнча мугалимдерди даярдоодогу дисциплиналар аралык интеграциянын мазмундук аспекти аныкталган. Тил менен кесиптик билимди интеграциялоонун эффективдүү каражаты катары CLIL (Content and Language Integrated Learning) технологиясынын мүмкүнчүлүктөрү талдоого алынган. Ж. Баласагын атындагы Кыргыз улуттук университетинде жүргүзүлгөн эксперименталдык изилдөө эксперименталдык топтун лингводидактикалык компетенттүүлүгүнүн көрсөткүчтөрүнүн кыйла жакшырганын көрсөттү. Ошентип, эгерде экспериментке чейин студенттердин 10 %ы жогорку деңгээлдеги компетенттүүлүгүн көрсөтсө, CLIL программасын ишке киргизгенден кийин бул көрсөткүч 70 %га өскөн. Ошол эле учурда компетенттүүлүк деңгээли төмөн студенттердин үлүшү 60 %дан 0 %га чейин төмөндөгөн. Контролдук топто мындай олуттуу өзгөрүүлөр байкалган эмес. CLILди колдонуу студенттердин критикалык ой жүгүртүүсүн, тилин жана коммуникациялык көндүмдөрүн өнүктүрүүгө, ошондой эле алардын маданияттар аралык компетенттүүлүгүн бекемдөөгө өбөлгө түзөрү аныкталган. Дисциплиналар аралык интеграция окуу материалын тереңирээк өздөштүрүүгө, окуучулардын таанып билүү активдүүлүгүн активдештирүүгө жана алардын окууга болгон кызыгуусун арттырууга шарт түзөт. Изилдөөнүн практикалык мааниси, алынган натыйжалар келечектеги мугалимдердин лингводидактикалык компетенттүүлүгүн эффективдүү өнүктүрүү максатында жогорку окуу жайларында комплекстүү окуу курстарын жана методикалык материалдарды иштеп чыгууда колдонууга мүмкүнчүлүк берет

Негизги сөздөр: педагогикалык билим берүү; интеграцияланган билим берүү технологиялары; CLIL; тилдик билим берүү; кесиптик даярдык; критикалык ой жүгүртүү; коммуникативдик жөндөмдөр

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Аннотация. Современные вызовы в системе педагогического образования требуют внедрения инновационных подходов к формированию лингводидактической компетентности будущих учителей. Целью данной статьи было выявление особенностей и потенциала межпредметной интеграции в процессе формирования лингводидактической компетентности на основе интегрированных образовательных технологий. В работе использовались методы теоретического анализа научной литературы, сравнения, сопоставления, синтеза, систематизации, а также эмпирические методы, включая наблюдение, анкетирование, тестирование, опрос, интервью и педагогический эксперимент. По результатам исследования были определены содержательные аспекты межпредметной интеграции в подготовке педагогов. Проанализированы возможности технологии CLIL (Content and Language Integrated Learning) как эффективного средства интеграции языкового и профессионального образования. Экспериментальное исследование, проведенное на базе Кыргызского национального университета имени Ж. Баласагына, показало значительное улучшение показателей лингводидактической компетентности в экспериментальной группе. Так, если до эксперимента высокий уровень компетентности демонстрировали 10 % студентов, то после внедрения программы на основе CLIL этот показатель увеличился до 70 %. В то же время доля студентов с низким уровнем компетентности снизилась с 60 % до 0 %. В контрольной группе таких существенных изменений не наблюдалось. Установлено, что использование CLIL способствует развитию критического мышления, языковых и коммуникативных навыков студентов, а также укреплению их межкультурной компетентности. Межпредметная интеграция содействует более глубокому усвоению учебного материала, активизации познавательной деятельности студентов и повышению их интереса к обучению. Практическая значимость исследования заключается в том, что полученные результаты могут быть использованы при разработке интегративных учебных курсов и методических материалов в высших учебных заведениях с целью эффективного формирования лингводидактической компетентности будущих педагогов

Ключевые слова: педагогическое образование; интегрированные образовательные технологии; CLIL; языковое образование; профессиональная подготовка; критическое мышление; коммуникативные навыки



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Intercultural communication in digital space: Challenges and adaptation strategies

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Abstract. The rapid development of digital technologies has necessitated a rethinking of intercultural communication processes in the virtual environment, where traditional models of interaction are undergoing significant changes. The relevance of this research stems from the need to adapt intercultural communication to the conditions of the digital environment, where the transformation of familiar forms of communication requires not only a new theoretical understanding, but also the development of applied approaches that take into account the specifics of online interaction. The aim of this article was to identify and comprehensively analyse the linguistic, sociocultural and pragmatic challenges arising in the process of digital intercultural communication, as well as to develop strategies for effectively overcoming them. The study used methods of linguistic analysis, a comparative-cultural approach, and discursive analysis of digital communication on various platforms. As a result, key risks characteristic of virtual intercultural interaction were classified, typical communication failures arising from a reduction in the contextual richness of messages, the ambiguity of visual and non-verbal components (emojis, memes, gestures), the transformation of etiquette norms, and the asynchronous nature of communication. It was found that cultural differences significantly influence the perception of distance, hierarchy, time, and communication style in the digital environment. It was also found that participants in communication often have difficulty interpreting the intentions of their interlocutors, which leads to misinterpretation and conflict. Based on the data obtained, recommendations have been developed aimed at forming flexible speech behaviour, developing digital politeness and increasing the level of intercultural digital competence. The practical value of the article lies in the applicability of its results in the field of education, in the training of specialists in the field of intercultural communication, as well as in the field of digital design of internationally oriented platforms and services

Keywords: cross-cultural differences; communication strategies; adaptation in an online environment; digital ethics; non-verbal means of communication; emojis and memes; digital politeness

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■ INTRODUCTION

The intensive development of digital technologies has led to profound changes in the field of intercultural communication, necessitating a rethinking of established models of interaction and contributing to the formation of new forms of communication in the digital space. The relevance of this study is due to profound socio-cultural and pragmatic changes caused by the functioning of online platforms—from educational services to social networks and multimodal applications—which simultaneously promote intercultural dialogue and create new barriers to communication. Contemporary research offers valuable approaches to understanding these processes. Thus, L. Li & X. Zheng (2024) examined how emojis embody cultural symbols and influence the interpretation of messages in different cultures, emphasising that visual ambiguity often leads to misunderstandings between interlocutors. This idea echoes the findings of I. Dudko & N. Zaitseva (2024), who, in their study of the linguistic aspect of online communication, emphasised that a rich arsenal of graphic tools, such as emoticons and memes, plays an important role in successful communication. M. Saputra & A. Lama (2025) showed how online communication norms are combined with digital literacy and emotional intelligence, while identifying a gap in the adaptation of speech etiquette to the media environment.

In their review, L. Judijanto *et al.* (2025) emphasised the importance of developing intercultural competence and inclusive platform design to overcome differences in communication styles, access levels and understanding of behavioural norms. In this context, it is also important to consider that the culture of cyberspace use, or cyberculture, according to R. Sopivnyk *et al.* (2024), is a key factor in ensuring safety, ethics, and productivity in the digital environment, as it is based on communicative practices governed by certain requirements and frameworks. R. Heang & K. Chuong (2025) demonstrated the dual role of digital media: on the one hand, they open up new channels for cultural exchange, but on the other hand, if the cultural context is not taken into account, they can increase misunderstanding. When considering immersive technologies, X. Wei *et al.* (2022) noted that social VR environments create new opportunities for intercultural cooperation, but are limited by access barriers and design flaws that reduce communication effectiveness. I. Villanueva *et al.* (2025) showed that AI-mediated interaction can only have positive effects in conditions of cultural relevance and authenticity. P. Kusawat & S. Teerakapibal (2024) studied how cultural differences influence the perception of credibility, persuasion style, and interpretation of information in an online environment.

All of the above studies highlight several key themes: the ambiguity of visual and paralinguistic means, changes in speech etiquette norms, the impact of digital platform design and AI systems on the quality of intercultural communication, and barriers caused by unequal access to digital resources. Thus, the authors of this study sought to integrate these areas into a single analytical framework,

exploring how visual ambiguity, the transformation of etiquette, the characteristics of digital design, and cultural differences in perceptions influence intercultural communication in a virtual environment. The aim of this article was to analyse key communication challenges arising in intercultural interaction in the digital environment and to identify adaptation strategies that promote successful intercultural dialogue in a globalised digital space. The research objectives included: identifying the main difficulties of intercultural communication in an online environment; analysing the characteristics of linguistic and pragmatic failures in digital communication; investigating the role of visual and symbolic means (emojis, memes, etc.) in an intercultural context; systematising effective adaptation strategies and digital politeness practices; determining the direction of development of digital intercultural competence in various fields (education, media, business).

■ MATERIALS AND METHODS

This study is a conceptual, analytical, and partially comparative investigation aimed at identifying key challenges of intercultural communication in the digital space and developing adaptation strategies. The work was based on a systematic analysis of scientific publications, digital phenomena and communication practices in the online environment, with an emphasis on empirical understanding of linguistic and sociocultural aspects. The theoretical framework was based on concepts of intercultural communication (in particular, Hofstede's and Hall's models), elements of digital linguistics (including visual-paralinguistic semiotics) and principles of media sociology applied to virtual spaces. The theories were used at the stage of interpreting the meanings revealed in the content analysis.

The first stage of the study included a systematic review of scientific literature. Publications were searched in the Web of Science, Scopus, Google Scholar, and ScienceDirect databases using the keywords: “intercultural communication”, “digital discourse”, “emoji interpretation”, “online etiquette”, “cross-cultural interaction online”, “digital politeness”, and “communication breakdown digital”. Only English-language peer-reviewed articles were included, with the main inclusion criteria being: relevance to the research topic, the presence of an empirical basis or theoretical interpretation of digital interaction, and applicability to an international context. Works dealing exclusively with offline communication or considering digital interaction outside a cross-cultural framework were excluded.

In the second stage, an empirical corpus of digital phenomena reflecting current issues in intercultural communication was formed. Open data from social networks (Instagram, Reddit, X), messengers (WhatsApp, Telegram) and multimodal platforms (YouTube, TikTok) containing emojis, memes, comments and text messages in English. The selection was based on representativeness, taking into account cases that sparked discussion, conflicting interpretations or distortions of meaning related to cultural

differences. A total of 120 pieces of digital content were selected. As a result of the analysis, 45 publications were selected, of which 28 were included in the final study. Three methods were used for the analysis: content analysis, categorised according to the following parameters: type of visual element (emoji, meme, gesture), its presumed meaning, frequency of use, and recorded cases of misinterpretation; thematic analysis aimed at identifying key themes and patterns-in particular, transformations of etiquette, differences in the understanding of distance and hierarchy, as well as mechanisms of speech adaptation (themes were coded manually and then grouped into generalised clusters); discourse analysis applied to fragments of online communication (in comments and correspondence) in which communication failures were detected. The speech structure, pragmatic markers, forms of address, and manifestations of politeness or conflict were analysed.

Data processing was carried out using text tables in MS Excel, as well as basic functions of the Atlas.ti platform for coding and visualising thematic connections. At each stage, internal cross-checking of interpretations was carried out to increase the reliability of the results. Thus, the research methodology not only identified key challenges in digital intercultural communication but also substantiated their systemic nature, which formed the basis for further recommendations on adapting speech behaviour in virtual environments.

■ RESULTS AND DISCUSSION

The main difficulties of intercultural communication in an online environment: Uncertainty in the interpretation of codes, politeness and expectations

In the digital age, a significant part of intercultural communication takes place through electronic channels such as email, instant messaging, video platforms and social media. This virtual environment creates unprecedented opportunities for global dialogue, but at the same time, it introduces new challenges related to cultural differences in the interpretation of signs, norms of politeness, and the expectations of communication participants. Below, the key challenges are examined based on contemporary English-language research.

Emojis, stickers, and smileys play a role as surrogates for nonverbal communication, but their meanings often vary in different cultural contexts. A study by J. Chen (2023) showed that the same emojis can be perceived differently-in some cultures, they help reduce misunderstandings, while in others, they become sources of conflict and misinterpretation. Similar results are reported in a review by B. Cominsky (n.d.), who noted that the perception of signs directly depends on the cultural context of the sender and recipient. In particular, S. Guntuku *et al.* (2019) highlight two main problems: different visualisation of emojis on devices and incorrect cultural interpretation (for example, a cheerful smiley face in one culture may be considered sarcastic in another). These aspects are particularly relevant for digital platforms, where the sender and recipient may

use different operating systems and perceptions. Online communication often lacks paralinguistic signals, forcing participants to compensate for this with more formalised or other speech strategies. A. Nkire (2024) investigated the pragmatics of politeness in intercultural communication and identified significant differences: East African cultures prefer indirect speech and an emphasis on respect for hierarchy, while Western cultures more often use direct forms of gratitude and openness. This picture is complemented by a study by C. Moon (2023), which examined email: East Asian representatives more often resort to apologies as a face-saving strategy, while Western users prefer expressions of gratitude and clarity.

Virtual channels amplify the influence of cultural context: in high-context cultures (e.g., in East Asia, communication begins with assumptions about the intangible meanings of messages), whereas low-context cultures (e.g., the United States, Western Europe) are oriented toward direct, clear forms of communication. As E. Hall (1976) notes, representatives of low-context cultures may perceive directness as rudeness, while representatives of high-context cultures may perceive it as incomprehensibility or dishonesty. Electronic communication is devoid of social repression, which increases the risk of aggressive behaviour. The absence of non-verbal cues and anonymity exacerbate cases of flaming-aggressive and harsh messages that would most likely be corrected by intonation or facial expressions in offline communication.

Many users have a basic knowledge of foreign languages and tend to interpret messages literally, without taking into account cultural subtext and pragmatic implications. In such situations, meaning is lost and erroneous judgements about the interlocutor are formed. The analysis identified several key aspects that complicate intercultural communication in the digital environment:

1. Visual and paralinguistic means (in particular, emojis) demonstrate a high degree of semantic variability in different cultures, which makes it difficult to interpret messages unambiguously and increases the risk of communication failures.
2. Differences in speech etiquette norms based on cultural perceptions of politeness, authority, and acceptable forms of expression often lead to misinterpretations of the interlocutor's intentions.
3. The contrast between high-and low-context communication models influences the structure and content of digital interaction, determining differences in the explicitness and implicitness of statements.
4. The absence of visual and voice accompaniment in online communication contributes to increased conflict, provoking aggressive behaviour (flaming), especially in conditions of anonymity.
5. An insufficient level of linguistic and intercultural competence leads to a literal understanding of texts, ignoring cultural subtext and the formation of distorted meanings.

All these factors point to the need for a comprehensive approach to developing digital intercultural competence,

including the development of flexible interpretation strategies, media literacy and respect for cultural differences.

Language and pragmatic disorders in intercultural digital communication

Intercultural communication in the digital environment is a complex and multifaceted process involving the intersection of not only languages, but also cultural models of thinking, speech norms, and communication strategies. At the same time, the digital space amplifies potential barriers and misperceptions, as it lacks many of the compensatory mechanisms of traditional communication, such as intonation, facial expressions, gestures, paralinguistic and contextual cues. One of the most common forms of communication breakdowns is language disorders caused by a mismatch between the lexical or syntactic level of communication and the expectations of the interlocutor. In the online environment, the widespread use of Anglicisms, abbreviations, internet slang and emojis requires a high degree of cultural adaptation. Lack of knowledge about the meanings of such elements can lead to misinterpretation and even conflict. Digital speech is characterised by a particular economy of linguistic means, which in a cross-cultural context is often perceived as coldness, harshness or rudeness (Kecskes, 2015). Alongside this, pragmatic failures are an important problem, which arise when interlocutors interpret the same speech strategy differently. This applies primarily to categories of politeness, forms of address, strategies of agreement and disagreement, and norms of emotional expression (Spencer-Oatey & Kádár, 2021; Spencer-Oatey & McConachy, 2024). M. Cai (2019) emphasises that the communicative patterns of Western and Eastern cultures differ significantly: for example, directness in Western culture can be interpreted as sincerity, while in Eastern culture it can be interpreted as rudeness.

In digital communication, and especially in professional or educational settings, time expectations related to response are significant (Bordi *et al.*, 2018; Chen, 2022). In cultures with a polychronic perception of time (e.g., in Asian and Latin American countries), a delay in response may not be considered a violation. However, in monochronic cultures (the United States, Germany, Scandinavia), delays in correspondence of more than a few hours are often perceived as disregard or disrespect. The lack of synchrony in digital interaction contributes to increased mistrust and communication inefficiency (Jong *et al.*, 2021). Visual semiotics, including emojis, GIFs, memes, and icons, play a special role in online communication (Yang *et al.*, 2023). As noted by O. Okey-Kalu *et al.* (2024), emojis do not have universal semantics. For example, the gesture 🙏 is more often understood as “thank you” in Western culture, while in Japan it means “I’m sorry”. Thus, visual symbols in the virtual environment become a source of ambiguity and require cultural interpretation.

Algorithmic interference – the intervention of technologies (automatic translators, chatbots, auto-replacements, and auto-responses) – is another significant source of

communication failures, as it can distort the meaning of the original statement. This is particularly relevant when using automatic translators in official correspondence. Without taking into account pragmatic nuances, such systems produce literal translations that are inadequate for the cultural context, leading to communication failures. At the same time, despite all the difficulties listed above, the digital environment creates opportunities for the development of new forms of media literacy and digital intercultural competence, which include not only knowledge of linguistic and cultural norms, but also the ability to adapt one’s message to the cultural profile of the addressee, choose appropriate registers of communication, and interpret media texts taking into account cultural differences.

Digital communication in the modern socio-cultural paradigm increasingly relies on multimodal elements-emojis, stickers, memes, GIF animations-which function as paralinguistic markers and serve as surrogates for non-verbal interaction. They replace or accompany verbal messages, enhance their emotional tone, structure discourse, and facilitate the interpretation of the sender’s communicative intentions (Chen, 2023). According to a study by J. Sun *et al.* (2022), the use of emojis depends on the cultural background of the communicator: cultural parameters such as individualism or collectivism directly influence the choice of visual symbols and how they are interpreted in communication. The authors emphasise the importance of intercultural competence for correctly interpreting the context of visual signs in digital interaction. L. Li & X. Zheng (2024) noted that the diversity and growing inclusivity of emojis expand the space for global cultural dialogue, but at the same time give rise to risks of semantic ambiguity and communication breakdowns. This is particularly relevant in cross-platform interactions, where the visual design of the same symbols can vary significantly depending on the device, software, and localisation used. Memes, in turn, serve as carriers of cultural connotations and “insider” information, which makes them difficult to interpret outside specific cultural communities. Thus, participation in digital intercultural dialogue requires communicators to have a high degree of semiotic sensitivity, the ability to read symbolic codes, interpret ambiguous visual signals, and adapt their own visual rhetoric in accordance with the cultural expectations of the addressee.

Effective strategies for adaptation and digital politeness in intercultural communication: A practical guide

In digital communication, which lacks non-verbal cues and cultural context, strategies aimed at adapting speech behaviour and developing digital politeness are particularly important. Below are key strategies with specific steps that can be applied by both individual users and organisations in the process of online intercultural interaction.

1. Improving digital intercultural competence. The essence of the strategy: developing awareness of cultural differences in communication and the ability to take them into account in a digital context. Practical steps: take

online courses on intercultural communication and digital etiquette (on platforms such as Coursera, FutureLearn, edX); study the main parameters of cultures (according to Hofstede, Hall, etc.): contextuality, power distance, attitude to time; conduct self-assessment using scales (e.g., Intercultural Sensitivity Scale or Intercultural Development Inventory); practise “translating” messages, taking into account possible cultural interpretations: “How might this be understood in another culture?”

2. Developing flexibility in speech behaviour. The essence of the strategy: the ability to vary the style, tone and structure of a message depending on the presumed cultural specificity of the addressee. Practical steps: use neutral wording, avoiding jargon, idioms and sarcasm; use polite phrases in formal correspondence, even if they are not mandatory in your own culture; ask clarifying questions (“How do you understand that?”, “Have I understood your answer correctly?”) to reduce the risk of misunderstanding; compare examples of business or informal correspondence from different countries (e.g., Western and Eastern email styles).

3. Controlled use of emojis, stickers, and GIF images. Strategy: consider cultural differences in the perception of visual elements and do not rely on them as universal symbols. Practical steps: before using emojis in international correspondence, check their interpretations in different cultures; avoid rare, local or potentially ambiguous emojis (e.g. 🤔, 🙄, 😏); in business and educational communication, accompany emojis with text explaining their emotional connotations whenever possible; analyse the emojis used in your own practice and assess their potential risks.

4. Digital politeness as an ethical standard. The essence of the strategy: introducing digital etiquette norms-respectful, contextually sensitive communication regardless of the platform. Practical steps: follow the principles of “netiquette” (polite greetings, expressions of gratitude, avoiding capital letters, punctuality in responses); maintain a correct style of communication even in situations of conflict or misunderstanding; develop organisational standards for online communication in international teams; include digital etiquette norms in corporate or academic training programmes.

5. Adapting speed and response time. The essence of the strategy: respect differences in perceptions of time, urgency, and communication rhythm. Practical steps: agree on response timeframes with partners in advance; be tolerant of delays in communication, especially in intercontinental interactions. Use answering machines with culturally neutral wording. Include phrases that indicate expectations: “A response within 48 hours would be acceptable” reduces stress on both sides.

6. Feedback and reflection. The essence of the strategy: systematic work on improving communication through feedback requests and self-analysis. Practical steps: periodically check with colleagues/students from other countries to see how clear your messages were; create anonymous surveys on the level of comfort and cultural sensitivity in communication; keep a journal of observations (which

phrases/reactions caused misunderstandings, how they could be rephrased); include analysis of real cases from digital correspondence in educational programmes.

Digital intercultural communication requires not only language skills, but also a willingness to adapt to differences in perceptions, styles and expectations. Effective strategies include developing flexibility, increasing sensitivity to visual and verbal cues, implementing digital etiquette and systematically developing intercultural awareness. Only a combination of awareness, empathy and practical skills can minimise the risks of misunderstanding and build productive intercultural relationships in the digital space. In the context of digital intercultural communication, the task of ensuring pragmatic compatibility, which involves taking into account norms of politeness and face-saving strategies, becomes particularly relevant. A study by L. Li & X. Zheng (2024) showed that the implementation of positive and negative politeness, according to Brown and Levinson’s theory, helps to minimise communication conflicts and increase the effectiveness of international interaction in an online environment. According to the authors, important elements of digital politeness include: observing verbal greeting and farewell rituals; moderation in the use of visual aids (emojis, stickers); acceptance of cultural distance and the expectations of the interlocutor; and conscious choice of visual elements depending on cultural conventions.

The results of an empirical study presented in the work of H. Kusmanto & P. Widodo (2022) showed that the use of positive politeness strategies-such as showing solidarity, humour, agreement, and creating a common “we”-contributes to improving the effectiveness of digital communication in educational, professional, and interpersonal spheres. Based on an analysis of online interactions in distance learning, the authors found that these forms of speech behaviour contribute to establishing trust, maintaining a positive emotional background and reducing the likelihood of communication failures. Mastering these strategies is particularly important in multicultural teams, virtual academic environments, and international electronic correspondence, where the absence of non-verbal cues must be compensated for by linguistic and pragmatic sensitivity.

Directions for the development of digital intercultural competence in key institutional areas

Educational environment. In educational practice, digital intercultural competence is developed through virtual exchange tools (Virtual Exchange, COIL-projects), which help to form skills in adapting intercultural content, interpreting visual symbols and managing asynchronous communication. In such conditions, media literacy and visual sensitivity of teachers and students play a special role (Dooley & Darwin, 2022).

Mass media and digital platforms. Media managers and communications specialists are faced with the need not only to translate, but also to localise visual content in line with the cultural expectations of the target audience.

This requires a deep understanding of symbolic codes and flexibility in choosing visual and verbal strategies aimed at increasing engagement and cross-cultural acceptability of information.

Business communication. In the context of global business, the development of digital intercultural competence is becoming a prerequisite for effective project management, negotiations and internal corporate interaction. Key aspects include: mastery of culturally specific communication styles; adaptation of polite formulas to the digital format; managing face-oriented behaviour; taking into account linear and polychronic time models in electronic correspondence (Chen, 2023). Such skills are particularly important when drafting business correspondence, conducting negotiations and developing visually oriented digital presentations. Furthermore, in a multilingual and multicultural digital space, they help to avoid communication misunderstandings related to differences in the interpretation of polite formulas, address structures, and stylistic conventions. Knowledge of cultural communication scenarios and hedging strategies contributes to a more accurate expression of communicative intentions and reduces potential conflict in online interactions. This is particularly relevant in intercultural negotiations, where the choice of lexical and visual means can have a direct impact on the level of trust and willingness to cooperate.

Practical experience confirms that the use of adapted forms of speech behaviour that correspond to the cultural expectations of the target audience significantly increases the effectiveness of digital business communication. A study by A. Nkirote (2024) showed that speech politeness styles-directly related to cultural norms such as power distance and preferred politeness style-directly influence the success of business interactions. In high-and low-context cultures (e.g., East Asia vs. Western Europe/USA), the choice of forms of address, level of formality, and manner of expressing gratitude or apologies determine the first impression and set the tone for further cooperation. When messages are formulated with cultural norms and visual preferences in mind-including the style of address, text structure, and use of elements such as punctuation or emojis-this significantly increases their receptivity and helps build trust. Adapted etiquette, backed by empathy and respect for cultural differences, creates a positive first impression, which often becomes the decisive basis for further interaction.

Formulating messages that take into account cultural norms and visual preferences of the recipient not only increases their receptivity, but also creates a positive first impression, which often determines the further trajectory of interaction. Flexibility in choosing the pace of communication, the structure of argumentation, and the visual representation of information demonstrates the level of professional intercultural training of a specialist. Visual elements such as infographics, emojis and colour palettes also require cultural adaptation: the same symbol can have a positive meaning in one culture and be unacceptable in

another (Atay & D'Silva, 2020). Thus, digital intercultural competence in the business environment is no longer an optional skill but an essential component of professional communication, determining the success of international projects, online learning and virtual leadership.

■ CONCLUSIONS

Based on a systematic analysis of English-language scientific sources and empirical data from digital platforms, the authors identified and classified key challenges affecting the success of intercultural online interaction. Firstly, it was established that the main source of communication failures is the ambiguity of visual and paralinguistic elements, such as emojis, stickers, and GIF animations, whose interpretation varies depending on cultural codes, the level of intercultural competence, and the semiotic experience of the communication participants. In addition, during the analysis of online discourse, it was found that differences in digital etiquette norms and speech behaviour strategies (e.g., directness vs. ritualised politeness, differences in the perception of response time) often lead to misunderstandings or the perception of the interlocutor as rude or disrespectful. Particular attention was paid to identifying typical communication failures that arise in multicultural teams and virtual educational communities. The practical result of the work was the identification of a set of effective adaptation strategies, including the development of semiotic sensitivity, flexible speech behaviour, and digital politeness aimed at maintaining a positive image of the interlocutor and minimising conflict risks. These strategies were specified through step-by-step recommendations for use in educational, professional, and business environments. The study also confirmed the effectiveness of positive forms of politeness (solidarity, humour, agreement), especially in multicultural interactions. Thus, the data obtained confirm the need for a comprehensive approach to the formation of digital intercultural competence, including not only linguistic, but also visual-semiotic, pragmatic and cultural-social training.

Prospects for further research are linked to expanding the empirical base by including multilingual content, analysing AI-mediated communication in intercultural contexts, and developing applied models for teaching digital intercultural literacy for various professional groups. Of particular interest is the study of the impact of automated platforms (chatbots, machine translation systems) on the distortion of meaning and the cultivation of stereotypes in global communication.

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Санариптик мейкиндиктеги маданияттар аралык коммуникация: чакырыктар жана адаптация стратегиялары

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Аннотация. Санариптик технологиялардын тез өнүгүшү өз ара аракеттенүүнүн салттуу моделдери олуттуу өзгөрүүлөргө дуушар болгон виртуалдык чөйрөдө маданияттар аралык коммуникация процесстерин кайра карап чыгууну талап кылды. Изилдөөнүн актуалдуулугу маданияттар аралык коммуникацияны санариптик чөйрөнүн шарттарына адаптациялоо зарылдыгы менен шартталган, мында коммуникациянын тааныш формаларын трансформациялоо жаңы теориялык түшүнүүнү гана эмес, ошондой эле онлайн өз ара аракеттенүүнүн өзгөчөлүктөрүн эске алган прикладдык ыкмаларды иштеп чыгууну талап кылат. Бул макаланын максаты санариптик маданияттар аралык коммуникация процессинде пайда болгон лингвистикалык, социомаданий жана прагматикалык көйгөйлөрдү аныктоо жана ар тараптуу талдоо, ошондой эле аларды натыйжалуу жеңүү боюнча стратегияларды иштеп чыгуу болгон. Изилдөөдө лингвистикалык талдоо ыкмалары, салыштырмалуу маданий мамиле жана ар кандай платформаларда санариптик коммуникациянын дискурстук анализи колдонулган. Жыйынтыгында виртуалдык маданияттар аралык өз ара аракеттенүүнүн негизги тобокелдиктери классификацияланды, билдирүүлөрдүн контексттик байлыгынын азайышынан, визуалдык жана вербалдык эмес компоненттердин (эмодзилер, мемдер, жаңсоолор) бүдөмүктүүлүгүнөн, этикет нормаларынын трансформациясынан жана коммуникациянын асинхрондук мүнөзүнөн улам келип чыккан типтүү коммуникация каталары талданды. Маданий айырмачылыктар санариптик чөйрөдө аралыкты, иерархияны, убакытты жана баарлашуу стилин кабыл алууга олуттуу таасир этээри аныкталган. Ошондой эле баарлашуунун катышуучулары маектешинин ниетин чечмелөөдө көп кыйынчылыктарга дуушар болуп, маанилердин бурмаланышына жана конфликттерге алып келери аныкталган. Алынган маалыматтардын негизинде ийкемдүү сүйлөө жүрүм-турумун калыптандырууга, санариптик сылыктыкты өнүктүрүүгө жана маданияттар аралык санариптик компетенттүүлүктүн деңгээлин жогорулатууга багытталган сунуштар иштелип чыккан. Макаланын практикалык баалуулугу анын натыйжаларын билим берүү чөйрөсүндө, маданияттар аралык коммуникация тармагында адистерди даярдоодо, ошондой эле эл аралык багыттагы платформаларды жана кызматтарды санариптик дизайн чөйрөсүндө колдонуу мүмкүндүгүндө.

Негизги сөздөр: маданияттар аралык айырмачылыктар; байланыш стратегиялары; онлайн чөйрөдө адаптациялоо; санариптик этика; вербалдык эмес байланыш каражаттары; эмодзилер жана мемдер; санариптик сылыктык

Межкультурная коммуникация в цифровом пространстве: вызовы и стратегии адаптации

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Аннотация. Стремительное развитие цифровых технологий обусловило необходимость переосмысления процессов межкультурной коммуникации в виртуальной среде, где традиционные модели взаимодействия подвергаются значительным изменениям. Актуальность исследования обусловлена необходимостью адаптации межкультурной коммуникации к условиям цифровой среды, в которой трансформация привычных форм общения требует не только нового теоретического осмысления, но и разработки прикладных подходов, учитывающих специфику онлайн-взаимодействия. Целью данной статьи было выявление и комплексный анализ лингвистических, социокультурных и прагматических вызовов, возникающих в процессе цифровой межкультурной коммуникации, а также разработка стратегий их эффективного преодоления. В исследовании использовались методы лингвистического анализа, сравнительно-культурного подхода, а также дискурсивный анализ цифрового общения на различных платформах. В результате были классифицированы ключевые риски, характерные для виртуального межкультурного взаимодействия, проанализированы типичные коммуникативные сбои, возникающие из-за снижения контекстной насыщенности сообщений, многозначности визуальных и невербальных компонентов (эмодзи, мемов, жестов), трансформации норм этикета и асинхронного характера общения. Установлено, что культурные различия существенно влияют на восприятие дистанции, иерархии, времени и стиля общения в цифровой среде. Также было выявлено, что участники коммуникации нередко испытывают трудности в интерпретации намерений собеседника, что приводит к искажению смыслов и конфликтам. На основе полученных данных разработаны рекомендации, направленные на формирование гибкого речевого поведения, развитие цифровой вежливости и повышение уровня межкультурной цифровой компетентности. Практическая ценность статьи заключается в применимости ее результатов в образовательной сфере, при подготовке специалистов в области межкультурной коммуникации, а также в сфере цифрового дизайна международно-ориентированных платформ и сервисов.

Ключевые слова: кросс-культурные различия; коммуникативные стратегии; адаптация в онлайн-среде; цифровая этика; невербальные средства общения; эмодзи и мемы; цифровая вежливость



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Professional burnout of teachers: Causes, consequences and ways of prevention

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Abstract. In the context of a modern educational system undergoing constant reforms and transformations, the issue of professional burnout among educators is becoming increasingly relevant. This article was dedicated to a comprehensive study of the relationship between teachers' salary levels and the degree of their professional burnout. The growing workload, high expectations from administration, parents, and society, as well as the need for continuous professional development and adaptation to digital technologies, significantly intensify stress-inducing factors in teachers' professional activities. Against this backdrop, the role of material factors-particularly salary level-in the development and progression of burnout syndrome becomes especially critical. The purpose of this article was to thoroughly examine the correlation between teachers' wages and the level of their professional burnout, as well as to identify the influence of financial factors on teachers' psycho-emotional state, motivation, and professional effectiveness. The study employed methods such as analysis and synthesis of scientific literature, sociological surveys (questionnaires), interviews, and statistical analysis. The research yielded significant findings that confirm a stable correlation between teachers' salary levels and the degree of their professional burnout. More than 70% of surveyed teachers reported low salary levels; correlation analysis revealed a direct dependence between the level of financial remuneration and the severity of burnout symptoms. It was also found that motivation for professional activity and job satisfaction are influenced not only by salary, but also by other factors. The results of this study have both practical and theoretical value and can be used by various categories of specialists and institutions in the field of education and human resource management: school administrators, educational authorities, researchers, university lecturers and graduate students, psychologists, and burnout prevention specialists

Keywords: emotional exhaustion; depersonalisation; stress; motivation; working conditions; psychological support

■ INTRODUCTION

The relevance of the research topic is due to the growing attention to the mental and physical health of teachers in the context of modern educational realities. In a rapidly changing educational environment, professional burnout among teachers is becoming one of the most pressing issues requiring comprehensive study and effective solutions. Rapid reforms, increasing qualification requirements, an increase in administrative work, and pressure from parents

and society create significant psychological and physical stress for education workers. These factors have a particularly acute impact on teachers' emotional state, motivation and professional effectiveness, which directly affects the quality of the educational process and the success of students. In light of these challenges, studying the causes, mechanisms and consequences of professional burnout, as well as the factors influencing its development, is

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becoming critically important for the development of preventive measures and support for teachers.

Thus, J. van Zyl & P. Clarke (2024) determined that teaching is an important profession, but it is precisely in this profession that burnout is commonplace and there is a lack of flexibility, which is increasingly expected in most professions. The authors thus emphasised the specificity of the burnout process among teachers. L. Kollerová *et al.* (2023) noted that teachers more often than other working adults cite low pay, paperwork and behavioural problems with students as causes of stress. Renowned journalist M. Madigan (2024) also wrote about the alarming reason why an entire Australian industry could be threatened by mass exodus, as workers increasingly report burnout. I. Groza (2009) emphasised that in educational institutions, teachers often face the problem of emotional burnout, and not everyone can cope with it on their own. Moreover, burnout is contagious: teachers who are susceptible to this process can quickly turn an entire group into a collection of “burnouts”.

Finding ways to address this problem is of fundamental importance for such areas of psychology as personality psychology and related social and educational psychology (Pazukhina, 2022). According to a study by S. Evstafyeva *et al.* (2016), after 20 years of working in schools, the vast majority of teachers experience emotional burnout, and by the age of 40, all teachers are emotionally exhausted. In a certain sense, according to E. Sokolova (2024), professional burnout is a protective mechanism of the human psyche that is triggered as a defensive reaction to potentially psychologically traumatic events. The work functions of teachers imply not only the transfer of knowledge, but also require emotional commitment to students, being more sensitive when interacting with children and their parents for the effective implementation of educational tasks (Kruzhkova *et al.*, 2025). To this end, it is important that teachers have sufficient psychological resources and physical and emotional strength for open pedagogical interaction. However, as pointed out in the work of E. Senatorova *et al.* (2024), among the causes of professional burnout among teachers are also violations of the safety of the educational environment: coercion to work through threats against their will, unsatisfactory relations between teachers and their superiors or members of the work collective, and the inability to express their point of view.

Professional emotional burnout in teachers can lead to various negative consequences. Firstly, it can lead to a decline in the quality of their lectures (lessons) and a deterioration in students' learning outcomes. Second, it can cause health problems such as depression, anxiety, insomnia and other disorders (Cherkasova, 2024). According to N. Paudel *et al.* (2024), emotional exhaustion refers to experiencing severe fatigue and low energy levels. Depersonalisation or dehumanisation, which can arise as a result of burnout, include adopting negative and cynical views, loss of interest and enthusiasm, and a lack of empathy towards others. Personal achievements, on the other hand, lead to the

ability to solve new problems and experience a sense of satisfaction. M. Burykina *et al.* (2024) identified several stages in the development of professional burnout: (1) the stress stage-increased demands on work performance, expansion of job responsibilities; (2) resource depletion stage-exhaustion of adaptive capabilities, appearance of the first signs of emotional burnout; (3) internalisation of negative attitudes and cynicism stage.

Thus, contemporary research demonstrates the multifaceted nature of professional burnout among teachers and its close connection to salary levels and working conditions. However, despite the significant amount of work done, questions remain regarding the optimal models for preventing burnout, taking into account the regional and institutional characteristics of educational systems. This requires comprehensive empirical research aimed at identifying the specific influence of material factors on the psycho-emotional state of teachers in various social and economic conditions. This study aimed to analyse the correlation between the size of remuneration of employees in the education sphere and the severity of their professional burnout syndrome, while also determining the impact of economic conditions on psychological well-being, work motivation and the effectiveness of teaching activities.

■ MATERIALS AND METHODS

The study was conducted between February and April 2025 at the Jusup Balasagyn Kyrgyz National University. The object of the study was university teachers. The study included 50 teachers aged between 30 and 60 with at least three years of teaching experience. Inclusion criteria: permanent employment at an educational institution (at least 0.5 FTE), participation in educational activities at the time of the study. Teachers who were temporarily not working, as well as specialists performing exclusively administrative functions (department heads, directors), were excluded in order to maintain focus on teachers. The sample was formed purposefully (target selection) taking into account the diversity of salary levels and working conditions. At the same time, a balance was ensured in terms of age, gender and specialisation. The study included teachers with different working conditions and income levels.

The survey included several thematic blocks and was conducted anonymously and voluntarily in an online format (Google Forms). All participants provided informed consent, which specified the objectives of the study, confidentiality guarantees, and the right to withdraw from participation at any stage. The questionnaire contained both closed and open-ended questions, using a Likert scale to assess subjective feelings and attitudes towards working conditions. Table 1 presents the main sections and examples of questions. Wage levels were measured based on the participants' own subjective assessments. Respondents classified their income as low, average or high compared to the regional average. This decision was made because absolute figures can distort perceptions due to regional differences and individual expenses.

Table 1. Main sections and examples of questions in the questionnaire

Questionnaire section	Question type	Examples
General information	Closed	Age, experience, subject taught, school type
Financial situation	Likert scale subjective assessment	Assess your salary level (low/average/high). Is your salary sufficient to meet your basic needs?
Emotional state	Likert scale, open-ended	Do you feel tired at the end of the working day? Do you feel less motivated to work?
Psychological support	Closed	Do you have a psychological support service for teachers at your university?
Assessment of professional motivation	Likert scale	Do you feel satisfied with your profession? How motivated are you to continue working in education?

Source: compiled by the authors

A comprehensive methodological approach was used to obtain reliable data. First, participants filled out a questionnaire containing questions about their level of satisfaction with their salary, working conditions, availability of professional and psychological support, degree of fatigue, and motivation to work. Next, the MBI – Maslach Burnout Inventory (Maslach & Jackson, 1981) methodology was applied. Adapted for Russian-speaking participants, this methodology made it possible to quantitatively assess the severity of three components of burnout: emotional exhaustion, depersonalisation, and personal accomplishment. The validated Russian adaptation of the Maslach Burnout Inventory questionnaire included 22 statements grouped into three scales:

1. Emotional exhaustion (9 points) – for example, “I feel emotionally drained from work”.
2. Depersonalisation (5 points) – for example, “I have become more callous towards my students”.
3. Reduction in personal achievements (8 points) – for example, “I feel that I have achieved a lot in my profession” (inverse scale).

Responses were rated on a seven-point Likert scale ranging from “never” to “daily”. Data collection was carried out by the authors of the study in collaboration with coordinators. All questionnaires were coded and anonymised. Full confidentiality of the data obtained was ensured in accordance with the Guidance Note of the European Commission on Ethics and Data Protection (2021).

Within the empirical part of the study, an important addition to the questionnaire was semi-structured interviews with teachers aimed at deeper understanding of subjective experiences related to professional burnout and the impact of salary levels on emotional state and motivation. The use of interviews made it possible to obtain qualitative data that supplemented and refined the quantitative results collected through questionnaires and surveys. The interviews were conducted in person, individually, and lasted between 25 and 40 minutes. To ensure reliability and enable subsequent analysis, all interviews (with the consent of the participants) were recorded on a voice recorder and then transcribed manually. Confidentiality was strictly observed: the names of the participants were not disclosed, and the recordings were stored in encrypted form. The structure of the interviews included the following thematic blocks:

- Perception of salary level and fairness;
- Emotional experiences related to professional stress;
- Feeling tired, burnout, loss of interest in work;
- Sources of support (from the administration, colleagues, family);
- Motivation to continue working at school;
- Opinions on possible measures to improve working conditions and prevent burnout.

Examples of questions: How do you assess your salary compared with the amount of work you do? Do you ever feel tired, apathetic or irritable after a day at work? Do you feel that your work is undervalued? What forms of support do you consider most effective in reducing burnout?

The analysis of the interviews was conducted using qualitative content analysis: key themes, recurring meanings, emotional emphases, expressions of dissatisfaction, anxiety or, conversely, satisfaction were identified. Based on the data obtained, typical scenarios of burnout were formulated, and differences in emotional attitudes towards work between groups with different income levels were identified. IBM SPSS Statistics 27.0 software was used for statistical analysis of the data obtained during the study. Descriptive statistics (averages, medians, standard deviations), Pearson’s correlation analysis, analysis of variance (ANOVA) and Student’s t-test were used to identify significant differences between groups with different income levels and severity of burnout symptoms. The empirical research methodology was aimed at ensuring high data validity and representativeness, while a multi-level approach allowed for covering both quantitative and qualitative aspects of the problem under study.

■ RESULTS AND DISCUSSION

The results of the study showed that teachers with low salaries were significantly more likely to demonstrate high levels of emotional exhaustion and depersonalisation, as well as reduced professional self-esteem. In contrast, among participants with higher incomes or access to psychological support programmes, the level of burnout was significantly lower. Thus, the empirical study confirmed the hypothesis of a significant influence of material factors on the development of professional burnout and emphasised the need for systematic measures to improve working conditions and the moral and psychological climate in the educational environment. The questionnaires and interviews conducted

during the study confirmed the significance of the relationship between teachers' salary levels and the degree of their professional burnout.

Data analysis showed that among the teachers surveyed, 70% receive salaries below the average for the region, with this group exhibiting higher levels of burnout symptoms, including emotional exhaustion and depersonalisation. The interview results confirmed the statistical findings: low salaries are often accompanied by feelings of helplessness, fatigue, and a lack of prospects. At the same time, teachers with higher incomes, especially those with internal motivation and professional recognition, demonstrated greater satisfaction with their work and were less susceptible to burnout.

During the study, the average emotional exhaustion score among teachers with low salaries was 28.7 points on the MBI scale (with a critical level of 27 and above),

while among teachers with above-average salaries, it was 19.3 points. Similarly, depersonalisation scores in the first group reached 12.4 points, which is significantly higher than the average scores in the second group (7.1 points). Personal effectiveness, on the other hand, was lower among teachers with low salaries, indicating a decline in professional satisfaction and a sense of success. Correlation analysis confirmed a statistically significant negative relationship between salary level and emotional exhaustion ($r = -0.62$, $p < 0.01$), as well as between salary and depersonalisation ($r = -0.54$, $p < 0.01$). Multiple regression results showed that salary level is one of the key predictors of professional burnout, along with work intensity and level of social support. In particular, a 10% increase in salary is associated with a decrease in emotional exhaustion by an average of 3.5 points. The results of the teacher survey are presented in Table 2.

Table 2. Results of the survey of teachers on signs of professional burnout depending on salary level ($n = 50$)

Indicator	Teachers with low salaries (below the regional average, 70% of the sample, $n = 35$)	Teachers with above-average salaries (30% of sample, $n = 15$)
Emotional exhaustion (according to the MBI scale, average score)	28.7	19.3
Depersonalisation (average score)	12.4	7.1
Personal effectiveness (trend downward, subjective)	Low satisfaction and sense of failure	Moderate/high satisfaction
Correlation between salary level and exhaustion	$r = -0.62$, $p < 0.01$	–
Correlation between salary level and depersonalisation	$r = -0.54$, $p < 0.01$	–
Expected reduction in depletion with a 10% increase in wages	by an average of 3.5 points	–
Quality comments (based on interview data)	“Feeling unappreciated, stressed, unfair”; “Financial difficulties worsen the quality of life”	“Greater stability and less psycho-emotional stress”

Source: compiled by the authors

During the interviews, teachers noted that low salaries create a sense of undervaluation and injustice, increasing stress and negatively affecting motivation. “When you feel that your work is not properly paid, it demotivates you and reduces your desire to give your all”, said one of the study participants. In addition, many respondents linked financial difficulties to a deterioration in their quality of life, which exacerbated their psycho-emotional state and contributed to the accumulation of stress.

The results of the study correspond to the conclusions of scientists from other countries, who emphasised the role of material factors in the formation of professional burnout syndrome. For example, in the work of J. Smith *et al.* (2022), it is indicated that low pay is one of the most significant stressors among teachers, affecting their emotional well-being and willingness to continue working. Similar data are presented in a study by S. Doan *et al.* (2024), where salary is identified as a critical factor influencing staff turnover and the overall effectiveness of the education system. However, as interviews and literature analysis have shown, material factors are not the only ones influencing burnout. Organisational and social aspects, such as

the quality of leadership, recognition of merit, opportunities for professional growth, and the level of support from colleagues, are also important. The results confirmed that high workloads and insufficient financial compensation create a vicious circle, increasing stress and contributing to burnout. Similar conclusions were reached in a study by S. Pakdee *et al.* (2025). In a context of constant reform and growing demands on teachers, it is important to consider the problem not only from the perspective of increasing salaries, but also from the perspective of comprehensively improving working conditions and creating a support system. In addition, there is a significant difference in the perception of burnout and salary between teachers with different lengths of service. Young professionals more often point to low salaries as the main stress factor, while experienced teachers emphasise the importance of recognition and working conditions. This indicates the need for a differentiated approach to burnout prevention depending on professional experience.

It should be noted that an increase in financial remuneration can have a positive impact not only on reducing burnout symptoms, but also on the overall motivation

and quality of teachers' work, which ultimately affects students' educational outcomes. Teachers who are satisfied with their working conditions show greater commitment, creativity and initiative, contributing to the creation of a favourable educational climate. Conversely, teacher burnout can be transferred to their students (Tikkanen *et al.*, 2021). According to the burnout theory of C. Maslach & S. Jackson (1981), professional burnout is a psychological syndrome that arises in response to prolonged professional stress and includes three key components: emotional exhaustion, depersonalisation, and reduced personal accomplishment. Contemporary research, including the present study, confirms that teachers are at increased risk because their work requires constant emotional involvement, high responsibility, and interaction with people, often in conditions of insufficient material and social support. According to A. Stol (2023), one of the key factors contributing to emotional exhaustion among teachers is the imbalance between work effort and remuneration. Most teachers in municipal schools, due to low salaries and a shortage of teachers, are forced to choose increased workload at school and tutoring to increase their income. Similar conclusions are presented in the work of S. Egoryshev (2023), which notes that chronic stress caused by underappreciation of work leads to the development of depersonalisation and a decrease in the sense of professional significance. Authors from other countries also emphasise the link between low wages and emotional burnout. For example, M. Leiter & C. Maslach (2024) presented the main conceptual changes relating to professional burnout, and in a study by E. Skaalvik & S. Skaalvik (2020) emphasise that low income reduces intrinsic motivation and increases feelings of injustice, which in turn accelerates emotional burnout.

The results obtained in the current study are also consistent with a broader understanding of the factors influencing teachers' occupational health. In particular, the study by N. Kotsur & L. Tovkun (2023) highlights the problem of the deterioration of teachers' psychosomatic health and the increase in the risks of occupational pathology. The authors emphasise that in modern conditions, the influence of such negative psychological factors as chronic stress, neuropsychological tension, fears, anxiety and depression is increasing. It has been found that these factors can lead to the development of emotional burnout syndrome, especially among teachers who are at risk. This confirms the observation that high levels of workload and stress, caused in part by external circumstances, are significant predictors of burnout. Authors R. Bianchi *et al.* (2013), I. Schonfeld & R. Bianchi (2016) also established a direct link between burnout and depression. A study by L. Kaskova & N. Morhun (2024) showed that indicators of life meaning also play an important role in the system of factors contributing to professional burnout among teachers. A link has been identified between the level of meaning in life and the characteristics of professional burnout. This complements the conclusion that a comprehensive approach to burnout prevention is

necessary, including the development of teachers' internal resources and the formation of a positive attitude towards their work. A study by N. Metelska (2023) focuses on the characteristics of self-esteem among teachers with varying levels of emotional burnout. Despite fairly high levels of self-approval and positive self-esteem, the teachers surveyed reported feeling that their personality was not interesting to those around them and their colleagues, which may indicate a certain emotional closedness and detachment characteristic of emotional exhaustion. This is consistent with the idea that recognition and support from colleagues and management are important factors in preventing burnout, as positive self-esteem and a sense of self-worth reduce the risk of emotional exhaustion and depersonalisation.

Thus, the results of this study emphasise the need for a comprehensive approach to addressing the problem of professional burnout among teachers. Increases in salaries should be accompanied by organisational measures aimed at optimising workloads, developing professional competencies and creating an effective system of social and psychological support. Based on the study, the authors formulated a number of comprehensive recommendations aimed at reducing the level of professional burnout among teachers and increasing their motivation to work.

One of the key areas is the development and of programmes that help strengthen professional motivation and reduce stress. Within such programmes, it is important to consider both internal and external motivational factors. Internal factors include opportunities for self-fulfilment, professional growth, recognition of achievements and autonomy in decision-making. External motivation can be enhanced through the creation of a fair bonus system, access to resources and support from management. In addition, corporate support practices, regular training on stress management and burnout prevention, as well as activities to foster a positive and respectful atmosphere in the workplace should be implemented.

The study confirmed the need for a systematic approach to the prevention of occupational burnout, which includes not only material measures, but also organisational, social and psychological components. To effectively reduce the level of burnout, the following is required:

1. Optimising workloads, including redistributing responsibilities and introducing flexible working arrangements to reduce the risk of chronic fatigue.
2. Implementation of professional development and training programmes aimed at developing stress resilience, self-regulation skills and emotional hygiene.
3. Creating conditions for career growth and development that foster a sense of professional success and recognition among teachers.
4. Improving working conditions for teachers, including providing them with the necessary teaching materials and modern technical equipment, as well as creating comfortable and safe conditions in the educational environment.

5. Organising systematic work on the professional development of teachers. Professional development should not be formal, but should take into account the real needs of teachers and be aimed at mastering modern educational technologies, developing digital competence and introducing innovative teaching methods.

6. Development of a psychological support system for education workers. Every educational institution should provide access to a professional psychologist who will work not only with students but also with teachers.

7. Financial remuneration should correspond to the level of responsibility, qualifications and significance of the teacher's work in society. In this regard, it is recommended to consider the possibility of a gradual increase in salaries, especially in regions where they are significantly below the national average.

The comprehensive implementation of these measures will contribute to the formation of a sustainable system of professional support for teachers, reduce burnout and increase the effectiveness of the educational process. In addition to the above measures, attention should be paid to the development of a system of mentoring and professional support for young specialists. Beginning teachers often face high levels of stress, lack of confidence in their abilities, and lack of practical experience, which can be a factor in early professional burnout. In this regard, it is recommended to introduce the institution of mentors-experienced teachers who will provide methodological and emotional support to young colleagues in the early stages of their professional careers.

It is also relevant to consider introducing regular monitoring of teachers' psycho-emotional state at the level of educational institutions, districts or regions. Timely identification of signs of professional burnout will allow for a rapid response to the problem by offering individualised support measures, such as participation in training, temporary reduction of workload, rotation of duties or referral to a specialist for consultation. Anonymous questionnaires or psychological testing conducted once or twice a year, as well as the creation of an internal database of recommendations and resources for self-regulation, can be effective tools. In addition, it is important to ensure that teachers are involved in decisions concerning the educational process and the organisation of work. A sense of involvement, the opportunity to influence work processes and be heard significantly reduces anxiety, fosters a sense of meaning in one's work and increases job satisfaction. The implementation of the proposed recommendations will improve the psychological and emotional well-being of teachers, increase their motivation and professional effectiveness, which, in turn, will have a positive impact on the quality of the educational process and reduce staff turnover in the education system. In conclusion, it can be concluded that

the close link between salary levels and the degree of burnout among teachers is a convincing argument in favour of implementing measures to improve the financial situation of education workers as an important component of a strategy to prevent professional burnout. In this regard, it can be argued that the results of the study can be used by heads of educational institutions and management bodies to develop programmes to support teachers and improve the quality of the educational process as a whole.

■ CONCLUSIONS

The study found a significant correlation between teachers' salaries and the degree of their professional burnout. Teachers with lower salaries demonstrate higher levels of emotional exhaustion, depersonalisation and reduced professional effectiveness. This indicates that financial factors play a key role in the formation and development of burnout syndrome among education workers. Apart from salary, this study showed that factors such as high workload, lack of social and administrative support, and limited opportunities for career growth and professional development have a significant impact on professional burnout. The presence of complex stressors creates a negative psycho-emotional background, leading to a decrease in motivation, deterioration in the quality of teaching and an increase in staff turnover.

Thus, the prevention of professional burnout requires a systematic approach that encompasses the material, psychological, organisational and social aspects of teaching. Only a comprehensive strategy, supported at all levels, from the collective to the state authorities, can lead to real improvement in the situation, the preservation of teachers' health and motivation and, as a result, to an improvement in the quality of education as a whole. Further research could focus on evaluating the effectiveness of preventive measures and developing tailored support models for teachers, taking into account regional and institutional characteristics.

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■ CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to the conduct and publication of this study.

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Мугалимдердин кесиптик чарчоосу: себептери, кесепеттери жана алдын алуу жолдору

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Аннотация. Туруктуу реформалар жана өзгөрүүлөр жүрүп жаткан заманбап билим берүү системасынын шарттарында педагогдордун кесиптик күйүп кетүү маселеси өзгөчө актуалдуулукка ээ болууда. Бул илимий макала мугалимдердин эмгек акысынын деңгээли менен алардын кесиптик күйүп кетүүсүнүн ортосундагы өз ара байланыштын комплекстүү изилдөөсүнө арналган. Жумуш жүгүнүн көбөйүшү, администрациянын, ата-энелердин жана коомчулуктун жогорку талаптары, квалификацияны тынымсыз жогорулатуу жана санариптик технологияларга ыңгайлашуу мугалимдин кесиптик ишмердүүлүгүндөгү стресске дуушар кылуучу факторлорду күчөтүүдө. Ушундай шарттарда материалдык фактордун, айрыкча, эмгек акынын кесиптик күйүп кетүү синдромуна тийгизген таасири курч маселе катары чыгууда. Бул илимий макаланын максаты – мугалимдердин эмгек акы деңгээли менен кесиптик күйүп кетүү даражасынын ортосундагы байланыштарды изилдөө, ошондой эле материалдык фактордун мугалимдердин психоэмоционалдык абалына, мотивациясына жана кесиптик ишмердүүлүгүнүн натыйжалуулугуна тийгизген таасирин аныктоо болуп саналат. Изилдөөнүн жүрүшүндө илимий адабияттарды талдоо жана жалпылоо ыкмасы, социологиялык сурамжылоо (анкета), интервью алуу жана статистикалык талдоо ыкмалары колдонулду. Аталган изилдөөнүн жыйынтыгында мугалимдердин эмгек акы деңгээли менен алардын кесиптик күйүп кетүү даражасынын ортосунда туруктуу байланыш бар экендигин тастыктаган маанилүү маалыматтар алынды. Башкы жыйынтыктар төмөнкүдөйчө жалпыланат: мугалимдердин 70 %дан ашыгынын эмгек акысы төмөн деңгээлде экени аныкталды, корреляциялык талдоо материалдык сыйлык деңгээли менен күйүп кетүү симптомдорунун күчтүүлүгүнүн ортосунда түз көз карандылык бар экенин көрсөттү. Ошондой эле, мугалимдердин кесипке болгон мотивациясы жана ишке канааттануусу жалаң эле эмгек акыга эмес, башка факторлорго да байланыштуу экени аныкталды. Изилдөөнүн жыйынтыктары билим берүү жана кадрлар менен иштөө тармагындагы ар кандай адистер жана мекемелер үчүн практикалык жана теориялык мааниге ээ. Изилдөөнүн жыйынтыктарын билим берүү мекемелеринин жетекчилери, билим берүү башкармалыктарынын адистери, илимий кызматкерлер, ЖОЖдордун окутуучулары жана аспиранттары, психологдор жана күйүп кетүүнүн алдын алуу боюнча адистер пайдалана алышат.

Негизги сөздөр: эмоционалдык чарчоо; деперсонализация; стресс; мотивация; эмгек шарттары; психологиялык колдоо

Профессиональное выгорание педагогов: причины, последствия и способы профилактики

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Аннотация. В условиях современной образовательной системы, находящейся в состоянии постоянных реформ и трансформаций, проблема профессионального выгорания педагогов приобретает все большую актуальность. Данная статья посвящена комплексному исследованию взаимосвязи между уровнем заработной платы педагогов и степенью их профессионального выгорания. Увеличение объема рабочей нагрузки, высокие требования со стороны администрации, родителей и общества, необходимость постоянного повышения квалификации и адаптации к цифровым технологиям значительно усиливают стрессогенные факторы в профессиональной деятельности учителя. На этом фоне особенно остро встает вопрос о роли материального фактора, в частности, уровня заработной платы, в формировании и развитии синдрома выгорания. Целью научной работы было изучение взаимосвязи между уровнем заработной платы педагогов и степенью их профессионального выгорания, а также выявление влияния материального фактора на психоэмоциональное состояние, мотивацию и эффективность профессиональной деятельности учителей. В ходе исследования были применены методы анализа и обобщения научной литературы, социологический опрос (анкетирование), метод интервью, статистический анализ. В результате были получены значимые данные, подтверждающие наличие устойчивой взаимосвязи между уровнем заработной платы педагогов и степенью их профессионального выгорания. Более 70 % опрошенных учителей сообщили о низком уровне заработной платы; корреляционный анализ выявил прямую зависимость между уровнем материального вознаграждения и выраженностью симптомов профессионального выгорания. В то же время установлено, что мотивация к профессиональной деятельности и удовлетворенность трудом напрямую зависят не только от заработной платы. Результаты исследования представляют практическую и теоретическую ценность и могут быть использованы различными категориями специалистов и учреждений в сфере образования и управления персоналом: руководителями образовательных учреждений, специалистами органов управления образованием, научными работниками, преподавателями вузов и аспирантами, психологами и специалистами по профилактике выгорания.

Ключевые слова: эмоциональное истощение; деперсонализация; стресс; мотивация; условия труда; психологическая поддержка



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The impact of digital idealisation of happiness on the emotional state and self-esteem of education seekers

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Abstract. The aim of the study was to identify the characteristics of the digital idealisation of happiness in social networks among education seekers. The methodology for examining the concept of happiness in the digital environment included a comprehensive analysis of interdisciplinary literature, a theoretical generalisation of the transformation of the concept under the influence of digital culture (particularly in the social networks Instagram, TikTok, and Facebook), and a content analysis of public accounts belonging to young people, with emphasis on the phenomena of digital idealisation, social comparison, and online self-representation. The study revealed that success in the digital environment for young people in Kyrgyzstan is shaped by a complex interplay of digital idealisation, social comparison, and online self-representation. It was found that young users post content that highlights material achievements, travel, career success, and an active lifestyle, thereby constructing an idealised perception of happiness. It was further noted that this content is often accompanied by positive vocabulary, metaphors, hyperbole, and hashtags, which amplify emotional impact and foster a high level of audience engagement. Simultaneously, this creates additional pressure on young individuals striving to meet these perceived standards, frequently resulting in cognitive dissonance and stress due to the mismatch between real life and digital “ideality”. The study also observed that audience reactions increase the perceived importance of digital validation of success, leading to a shift in values from genuine happiness to its virtual representation. This phenomenon manifests not only in attempts at self-realisation but also in emotional fatigue, anxiety, and heightened social sensitivity. The findings indicated that the perception of success among young people in Kyrgyzstan within the digital environment is shaped by an idealised virtual image of happiness, driven by social comparison, positive online self-representation, and a dependence on digital validation. The practical significance of this study lies in its potential application by educational institutions, psychologists, and social workers to develop programmes for digital hygiene, critical thinking, and psycho-emotional support for young people navigating the digital space

Keywords: emotional well-being; virtual images; psychological discomfort; social comparisons; technological influence

■ INTRODUCTION

The digital idealisation of happiness, shaped by social media and online content, is increasingly influencing students' perceptions of reality. Constant comparison of one's own life with visual representations of “ideal happiness” can result in emotional exhaustion, feelings of dissatisfaction, and reduced self-esteem. Young people, who are in the process of forming their personal identities, are particularly vulnerable to external digital influences. This necessitates an examination of how idealised portrayals of happiness in the digital space affect students' psycho-emotional states

and their levels of self-esteem. Researchers across various contexts have examined how the digital environment and social media influence perceptions of happiness, emotional well-being, and self-esteem, particularly among young people and students. For instance, A. Zhunushalieva *et al.* (2025) found that the idealisation of appearance in the digital environment served as a mediator between the desire for novelty, active social media usage, and demonstrative consumption among students. This suggests that students strive to conform to digital standards of beauty

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and success disseminated in the virtual space. The findings indicated a strong relationship between social comparison online and a decline in self-satisfaction. In particular, G. Madaminov *et al.* (2023) demonstrated that traits of interpersonal attractiveness contributed to feelings of happiness only when there was a low level of uncertainty in interactions. Their study showed that Facebook users experiencing informational uncertainty exhibited lower levels of emotional well-being. Simultaneously, positive feedback from other users significantly influenced individuals' perceptions of their own attractiveness and happiness. K. Burnell *et al.* (2024) summarised experimental data concerning the impact of social networks on the mental health of young people. They concluded that frequent social media use was associated with anxiety, depressive symptoms, and lower self-esteem. The researchers emphasised that comparison with idealised digital representations of others poses a particular threat. Y. Shi *et al.* (2024) explored the impact of digital facial processing on users' subjective happiness through the framework of discrepancy theory, which addresses the gap between the real and ideal self. They found that the greater the discrepancy between real-life and digital appearance, the higher the level of emotional discomfort. This effect was especially pronounced among young women who actively used beauty filters on social media. F. Fastoso & H. González-Jiménez (2020) discovered that congruence between the ideal self and the visual imagery of brands fostered emotional attachment. This effect was characteristic of individuals with high levels of materialism, who aspired to ideals commonly portrayed in digital advertising. Research has shown that digital representations of happiness can cultivate emotional dependence on external indicators of success. Finally, A. Siddiqi *et al.* (2024) reported that viewing Instagram photos depicting the seemingly happy lives of others led to lower self-esteem and feelings of inadequacy. Young people who actively engaged with such content – through likes and comments – were especially vulnerable. The authors highlighted the importance of critical thinking in interpreting visual digital content.

A study among adolescents with mental disorders, conducted by K. Winds *et al.* (2024), found that professional photography increased self-esteem and improved emotional state. The authors emphasised that a positive visual representation of oneself could serve as a resource for strengthening psycho-emotional well-being. The study also revealed that even short-term interventions could have a long-term effect in boosting confidence. F. Sibilla *et al.* (2021) conducted a study among MMORPG (massively multiplayer online role-playing game) players, which demonstrated that harmonious involvement in the game contributed to increased self-esteem and well-being. Conversely, obsessive involvement negatively impacted the psycho-emotional state, resulting in decreased life satisfaction. The authors underlined that the nature of interaction with the digital environment determines whether its influence is beneficial or harmful. M. Yi & S. La (2023)

found that motivations for self-presentation on social media influenced the enjoyment of cultural events and the overall quality of life. They observed that participants who actively shared their experiences reported higher levels of positive emotions. This highlighted the significance of digital self-actualisation in the pursuit of happiness and emotional comfort. A. Salas-Vallina *et al.* (2020) focused on the relationship between leadership style and employee happiness in a professional environment. Their study showed that inspirational leadership enhanced engagement and positive emotional states. These findings can be extrapolated to the educational context, where a teacher, acting as a leader, may similarly contribute to students' emotional well-being. Despite the valuable insights provided by the aforementioned researchers, notable gaps remain in the literature – particularly the insufficient attention to age and cultural differences in the perception of digital images of happiness. Furthermore, there is a lack of empirical data on the impact of the digital idealisation of happiness on students in the educational context, especially when considering their academic and social challenges. The aim of the present study was to conduct a comprehensive investigation into the relationship between digitalisation and the state of happiness, focusing on the psychological and emotional well-being of students. To achieve this objective, three main tasks were undertaken: firstly, an analysis of the theoretical and methodological foundations for studying the concept of “happiness” was conducted, allowing for the identification of scientific approaches to understanding this phenomenon; secondly, an assessment of digital representations of happiness in students' social networks was carried out, particularly focusing on the content they create and consume; thirdly, a practical application of the model of digital idealisation of happiness in the student environment was implemented, which helped identify the mechanisms through which digital content influences the psycho-emotional state and informed the development of recommendations to mitigate potential risks.

■ MATERIALS AND METHODS

The study was conducted in several stages using a combination of methods. At the first stage, a theoretical analysis of philosophical, psychological, pedagogical, and sociological literature – comprising 39 sources – was carried out to examine the evolution of the concept of “happiness”. Particular attention was given to classical conceptions of happiness found in the works of Aristotle (2009) and Epicurus (1994), as well as to modern scientific approaches, such as the hedonic and eudaimonic models. Within this stage, key components of the concept of happiness were identified according to criteria including emotional, cognitive, sociocultural, and existential dimensions, which are particularly significant for students – namely, subjective well-being, life satisfaction, self-realisation, and social support.

The second stage involved a comparative theoretical generalisation of the concept of happiness and its transformation under the influence of the digital environment.

Special emphasis was placed on the concepts of “digital idealisation”, “social comparison”, “online self-representation”, and “digital culture”. In particular, attention was directed towards the phenomenon of digital idealisation – the tendency to present exclusively positive, idealised images of life on social networks such as Instagram, TikTok, and Facebook. Through a combination of theoretical and empirical analysis, the study investigated the manifestations of digital idealisation, social comparison, and online self-representation, as well as the formation of digital culture on these platforms. The objective of this stage was to identify key digital trends linked to these phenomena, considering their widespread popularity and influence on young audiences. The selection of Instagram, TikTok, and Facebook was based on their high levels of use among young people and their strong emphasis on visual content, which plays a significant role in fostering digital idealisation and social comparison. Statistical data were obtained from large-scale surveys and studies conducted by leading analytical and research organisations, including Pew Research Center (Faverio *et al.*, 2025), Deloitte Insights (2023), and Common Sense Media (2018).

Using the method of content analysis, five public accounts of users from Kyrgyzstan who actively represent the youth and student demographic on social networks were analysed over a two-week period (April 2024). The sample included the following accounts: Bekbolsun Asanov, who shares motivational content, discusses personal achievements, and provides lifestyle insights; Nurzada Amangeldieva, whose account showcases travel, concerts, and an idealised personal life; Asylbek Taalaibek uulu, whose blog is dedicated to self-development, education, and entrepreneurship; Aziz Mambetov, an education seeker who creates entertaining content with elements of self-irony and indirect social comparison; and Zhazgul Zhumabaeva, an activist and student whose page combines content on gender equality, educational initiatives, and personal achievements. The content analysis was carried out using qualitative criteria that enabled the identification of key elements of digital influence on perceptions of happiness. Specifically, signs of digital idealisation were examined – namely, portrayals of exclusively positive, often idealised aspects of life such as travel photos, material accomplishments, and participation in notable events. Indicators of social comparison were also considered, particularly those highlighting elevated social status, success, attractiveness, and achievement relative to others. A significant aspect of the study involved analysing the visual style of the accounts as a component of digital discourse, particularly features of online self-representation: the use of self-portraits as a means of identity expression, the application of filters, photo captions, motivational rhetoric, and self-appraisal statements. Another important criterion was the presence of signs of social approval – namely, the nature of comments, the degree of audience interaction, and other engagement metrics. Psycho-emotional markers were analysed separately, including references to happiness,

stress, fatigue, inspiration, and self-realisation. These components were used as tools to illustrate theoretical concepts regarding the digital idealisation of happiness and mechanisms of social comparison. The aim of this phase, within the broader theoretical framework, was to interpret cultural and semiotic patterns.

All accounts analysed were public and intended for wide audience consumption. The value of these accounts lies in their representation of various facets of digital self-presentation among Kyrgyz youth, reflecting common behavioural patterns, value orientations, strategies for constructing the image of a “successful” life, and mechanisms of digital idealisation. This made it possible to identify typical patterns of social comparison, emotional self-regulation, and the development of conceptions of happiness within the digital environment. The study adhered to ethical standards in accordance with the provisions of the Declaration of Helsinki (2013), and written consent to use publicly available content was obtained from the account holders. The final stage of the study involved a theoretical modelling approach, through which the author’s model of the impact of digital idealisation of happiness on the psycho-emotional state of education seekers was developed. The model comprised the following interrelated components: the impact of digital content; the perception of an idealised image of happiness; social comparison; emotional reaction (e.g., decreased mood, anxiety); change in the level of self-esteem. This model was constructed on the basis of an analysis of the digital platforms of education seekers in Kyrgyzstan.

■ RESULTS

Analysis of the theoretical and methodological foundations of the study of the concept of “happiness”

In philosophical discourse, the concept of happiness has acquired various interpretations depending on the historical era and prevailing worldview paradigm. Notably, Aristotle (2009), in his work *Nicomachean Ethics*, regarded happiness (*eudaimonia*) as the highest goal of human existence, attainable through virtue, rational activity, and a harmonious life in accordance with human nature. According to Aristotle, happiness is not an immediate pleasure, but the culmination of a long process of moral self-improvement. This approach holds particular relevance for the educational environment, as it underscores the development of an individual’s inner potential – nurtured through learning, upbringing, and socialisation. The classical philosopher Epicurus advanced a hedonistic conception of happiness, defining it as the attainment of pleasure and the avoidance of suffering. However, it is important to note that Epicurus differentiated between physical and spiritual pleasures, placing greater value on the latter. For him, key conditions for happiness included inner balance, freedom from fear and excessive desire, and friendship as a vital source of emotional support. These ideas have since been expanded upon in modern psychological research, which highlights the importance of emotional well-being, social interaction, and support in shaping a happy personality.

Within the analysis of contemporary scientific approaches, particular attention was given to the hedonic and eudaimonic models of happiness, which are extensively employed in positive psychology. The hedonic model defines happiness as a collection of positive emotions and life satisfaction. It is based on the premise that a happy person experiences more pleasant emotions than unpleasant ones and is generally satisfied with life. This model was notably developed by E. Diener (1984), who introduced the concept of subjective well-being, comprising three components: the frequency and intensity of positive emotions, the infrequency of negative emotions, and an overall assessment of life satisfaction. Conversely, the eudaimonic model, proposed by C. Ryff (1989), emphasises self-actualisation, personal growth, a sense of life purpose, autonomy, and positive interpersonal relationships. Within this framework, happiness is not viewed as a fleeting emotion but as a sustained state arising from living in accordance with

one's values and aspirations. For example, a student engaged in volunteer work may not always experience immediate pleasure but may derive a profound sense of meaning and fulfilment from their actions – an indication of a high level of happiness according to the eudaimonic model.

Drawing on classical philosophical concepts (notably those of Aristotle and Epicurus), as well as modern psychological models (hedonic and eudaimonic), four principal components were identified: subjective well-being, life satisfaction, self-realisation, and social support. These components reflect the multidimensional nature of happiness and its significant role in shaping students' personalities and promoting a successful educational process. Below is a table providing a concise description of each component along with the criteria for their identification within the educational environment. Table 1 presents an overview of the key components of happiness in the educational context and the corresponding indicators used to determine their presence.

Table 1. Key components of happiness in an educational context: Characteristics and criteria

Happiness component	Characteristic	Key criteria
Subjective well-being	An individual's sense of life satisfaction and emotional balance. Reflects a positive perception of personal life circumstances and psychological comfort.	■ comfortable educational environment; ■ ability to independently choose an educational trajectory; ■ support from teachers; ■ emotional stability.
Life satisfaction	An overall positive assessment of quality of life, including personal, academic, social, and material well-being.	■ balance between study and rest; ■ harmonious family relationships; ■ financial stability; ■ opportunities for self-expression and leisure.
Self-realisation	Realisation of the inner potential of the individual, achievement of goals, development of abilities and awareness of one's own worth.	■ participation in competitions, conferences, projects; ■ professional self-determination – purposefulness; ■ compliance of activities with personal values.
Social support	A system of positive interpersonal relationships that provides emotional support, a sense of belonging, and security.	■ support from family and friends; ■ friendly atmosphere in the teaching team; ■ trust in teachers; ■ developed communication skills and social interaction.

Source: created by the author based on E. Diener (1984), C. Ryff (1989), Epicurus (1994), Aristotle (2009)

Digital idealisation, as one of the dominant phenomena of contemporary culture, is reflected in users' desire to showcase exclusively positive, successful, and visually appealing aspects of their lives on social media platforms. According to a study by Deloitte Insights (2023), more than 55% of young social media users admit to carefully editing their photos before posting them, in order to present a more attractive image. This creates the illusion of an idealised reality that does not necessarily reflect actual experience, yet strongly influences perceptions of happiness – both for the content creator and for the audience, who may engage in unconscious social comparison. Social comparison is another key phenomenon associated with the use of social networks. Individuals frequently and unconsciously compare their own lives with those of others online, which can provoke feelings of inferiority, envy, or dissatisfaction. For instance, a study by the Pew

Research Center found that approximately 60% of young people aged 18-29 experience emotional discomfort as a result of comparing themselves with others on social media (Faverio *et al.*, 2025). This process often contributes to reduced self-esteem, heightened anxiety, and symptoms of depression. Closely linked to digital idealisation is the concept of online self-representation. Users not only highlight their most successful attributes but also construct a type of “digital avatar” – an identity that may not align with their actual self. This is supported by findings from Common Sense Media (2018), which report that 58% of teenagers feel a constant need to maintain a positive image on social media, even when they are experiencing stress or personal difficulties in real life. Ultimately, these intertwined phenomena underscore the pervasive and often detrimental impact of curated digital environments on the psychological well-being of young people.

Assessment of digital representations of happiness in social networks of education seekers

Digital culture, in general, has contributed to changing perceptions of happiness. This study analysed public accounts of young users from Kyrgyzstan who actively maintain profiles on Instagram and TikTok. Within the digital environment, the concept of happiness is increasingly associated not with an internal emotional state, but with the visual portrayal of life, social recognition,

and quantitative indicators of success. Such representations place additional pressure on young individuals who attempt to align with the expectations of the virtual world – often at the expense of their real psychological well-being. Table 2 illustrates the characteristic features of digital representations of happiness across youth accounts in Kyrgyzstan, highlighting the main elements of digital idealisation, social comparison, and the emotional impact of such content.

Table 2. Examples of digital strategies for self-presentation of happiness in the accounts of Kyrgyz youth

Account	Content type	Illustrative signs of digital idealisation (visual, verbal)	Social comparison	Digital self-presentation strategies	Examples of digital approval/interaction	Tokens and images that shape the emotional atmosphere
@bekbolsun	Motivational content, lifestyle, personal achievements	Travel photos, positive posts about achievements	Direct demonstration of success through material goods and self-realisation	Frequent use of selfies, inspirational quotes, sayings about personal effectiveness	High activity	Inspiration, happiness, self-realisation
@nurzada.official	Music, concerts, travel, lifestyle	Bright photos from performances, glamorous images, idealised personal lives	Visual demonstration of higher social status	Filters, studio photos, captions with quotes about success and love of life	High level of interaction	Happiness, fatigue after touring, inspiration
@asylbek_kg	Self-development, education, entrepreneurship	Photos from speaking engagements, books, business events	Comparison through academic achievement, business goals	Structured posts, educational style, motivational quotes	Intermediate level, active student audience	Stress, goals, self-realisation, happiness
@azik_mambetov	Entertainment content, humour, self-irony	A less pronounced but idealised image of a cheerful, successful student	Ironic comparison with others (through humour)	Frequent videos with filters, humorous captions, presenting himself as a “simple but cool” guy	Very high level of interaction	Happiness, self-irony, sometimes mentions of fatigue
@zhazgul.zhumabaeva	Activism, gender equality, education, personal achievements	Photos from educational events, activities, personal stories	Comparison at the content level: showing an active, conscious student	Captions with a strong social message, selfies without filters, constant emphasis on values	Moderate activity	Inspiration, happiness, sometimes stress, desire for change

Source: created by the author based on content analysis of student accounts

According to the Table 2, all of the accounts studied demonstrate a certain level of idealisation of reality – most commonly through visual imagery (e.g., travel, concerts, and successful events), as well as through motivational captions or posts. Social comparison is evident both directly – through the display of status and achievements – and indirectly, through humour or participation in social initiatives. Online self-representation ranges from aestheticised portraits to activist content, yet the common focus lies in promoting success, self-realisation, and emotional well-being. The audience's response also plays a significant role: accounts with a higher level of engagement tend to reinforce a positive image, whereas accounts with moderate interaction are more likely to reflect on social issues or offer critical perspectives. Psycho-emotional markers – such as inspiration, happiness, fatigue, stress,

or a desire for change – reflect the multidimensional influence of digital content on personality. Analysis of social media content reveals frequent use of positive vocabulary by users, particularly words that convey joy, happiness, and emotional uplift. Posts commonly include words such as “happy”, “joy”, and “smile”, as well as diminutive and affectionate terms like “sun” and “joyful little one”, which enhance the emotional tone of the content. This type of vocabulary serves an important function: it contributes to the creation of emotionally warm and expressive posts, which generate a positive impression of the author and foster greater audience engagement.

Hashtags occupy a special role in this type of content. In addition to categorising posts by theme, they perform a symbolic function – signalling emotional states, personal values, and a sense of community belonging. The most

frequently used hashtags include: #happiness, #joy, #love, #life, #smile, #harmony, #soul, #inspiration, #bakit (Kyrgyz for “happiness”), #baktiluu (Kyrgyz for “happy”), #zhashoo (Kyrgyz for “life”), #behappy, and #happymoments. These hashtags serve a dual purpose: on the one hand, they help organise content, and on the other, they foster a sense of unity among users who seek positivity, support, and opportunities for self-expression. For example, the hashtag #happiness has over 31.5 million posts; #happinessinlittletings, 2.9 million; #happy, 8.3 million; #happinesstobehappy, 794 thousand; #bakit, 143 thousand; #baktiluu, 61.2 thousand; and #behappyinlife, over 29 thousand. These hashtags often accompany photos of significant moments, such as the birth of a child, engagements, weddings, holidays, gifts from loved ones, and travel experiences. These images tend to be bright, edited, and stylised in order to create an attractive appearance. As a result, an idealised notion of happiness is formed – one that is presented as a widely accepted norm. Viewers of such content may unconsciously begin comparing their own lives with this “filtered” reality. This can foster a desire to imitate what they see – in terms of appearance, emotional expression, and even celebratory rituals – potentially leading to a distorted perception of reality.

The digital space increasingly dictates the standards of what constitutes a “normal” life, and any deviation from this ideal often leads to anxiety and dissatisfaction with oneself. Simultaneously, experiences of hardship, doubt, and failure are rarely portrayed online – creating the illusion that problems are not a natural part of human existence. It can be assumed that, due to the dominance of idealised digital content, users’ levels of empathy may decline, and genuine communication about negative emotions is often avoided. Moreover, the language used in such publications tends to become formulaic, repeating similar phrases, constructions, and clichés. This not only impoverishes linguistic expressiveness but also complicates authentic interpersonal communication. Satisfaction is increasingly deferred – shifting from the immediate experience to the reaction of the audience. This reflects a shift in value orientations, where digital validation takes precedence over happiness itself. On platforms such as Facebook, users actively form groups with names like “happiness”, “add joy”, “I want to be happy”, “hope”, “smile more often”, and “family happiness”. These group names reflect a shared aspiration for positivity, harmony, and the creation of a supportive and safe environment for sharing personal experiences. The use of emotionally charged words in group titles helps to foster an inviting virtual space for communication and self-support.

Emotionally charged names of social groups on digital platforms perform several key functions. Firstly, they contribute to audience engagement, as potential members tend to identify with the positive values embedded in the group name. Secondly, such names establish a specific discursive context in which communication entails not only the exchange of information, but also emotional interaction, mutual support, and the creation of a shared community

of interests. An analysis of such group names from the perspective of cognitive linguistics allows for the identification of emotional concepts that hold the greatest relevance for social media users. The frequent use of words associated with happiness (e.g., bakyt, baktyluu), hope (umut), and smiling (kuluk) indicates a dominant positive emotional orientation in digital communication. This aligns with the understanding of language as a social tool that fosters and strengthens interpersonal connections within the digital space. It is worth noting the widespread use of group names such as “Happiness”, “Joy”, and “Bliss” – with approximately 350 such communities on Facebook alone, excluding compound group names containing these terms. On the Odnoklassniki network, the number of similar groups reaches around 23,000. In contrast, only one Facebook group uses the Kyrgyz word “bakyt”, despite the popularity of this name among users. On Odnoklassniki, just three such groups were identified, each with no more than two to three members. This can be attributed to the symbolic meaning of these words: whereas in Russian culture the word “happiness” functions solely as an abstract concept, in Kyrgyz culture Bakyt is often used as a personal name.

Traditional Kyrgyz culture viewed names as determinants of a person’s destiny. Thus, children were often given names with specific meanings – Bakyt, Baktybek, Baktygul, Bakdolot, Taalaybek, Yrys – all bearing positive semantic values such as “happiness”, “joy”, “prosperity”, and “hope”. This cultural tradition explains why Kyrgyz users rarely include “bakyt” in group names, instead favouring other emotionally or figuratively expressive terms. A common feature of social network language is the use of figurative expressions, such as: “the heart beats like never before”, “every moment is a flash of light”, or “the world shines brighter when you smile”, which create vivid and easily recognisable emotional imagery. Hyperbolic constructions are also prevalent, including phrases like “on top of the world” and “every day is a real holiday”, which intensify the emotional saturation of the content. Metaphors associated with happiness play a crucial role in shaping its digital image – e.g., “radiant happiness”, “on seventh heaven”, “warms the heart”. Such metaphorical structures enhance the emotional tone and frame happiness as an idealised, almost unattainable state. Thus, the language of social networks actively contributes to the creation of an idealised image of happiness, which may not reflect real-life experience. The dominance of positive formulations, filtered photographs, and stylised descriptions results in a distorted perception of everyday life. The use of comparative expressions (e.g., “the best day”, “the happiest moment”) and hyperboles (e.g., “unforgettable emotions”, “the happiest of all”) amplifies the sense of social competition, potentially affecting users’ self-esteem. The linguistic tools of digital discourse construct a specific representation of happiness as a social norm – conveyed through emotionally charged vocabulary, metaphors, emojis, and hashtags. Simultaneously, such content contributes to the illusion of an ideal life, which can lead to emotional fatigue and

undermine the authenticity of communication. Table 2 thus enables to observe how the digital environment influences the construction of happiness among young people, and what mechanisms – visual, emotional, and social – facilitate the transmission of these ideas in the public sphere.

Practical application of the model of digital idealisation of happiness in the student environment

In the digital environment of Kyrgyzstan, where a significant proportion of young people spend considerable time on social media, the need to analyse the impact of digital

content on students' psycho-emotional states is becoming increasingly urgent. The widespread dissemination of idealised images of success, beauty, and personal achievement fosters distorted perceptions of happiness. These misperceptions, in turn, influence young people's self-esteem, emotional well-being, and patterns of social behaviour. The proposed model (Table 3) provides a deeper understanding of the mechanisms underpinning this influence and offers practical recommendations for fostering digital hygiene, developing critical thinking, and enhancing psychological self-regulation within the educational process.

Table 3. Author's model of the impact of digital idealisation of happiness on the psycho-emotional state of education seekers

Model component	Content/details	Mechanism of influence	Signs in the behaviour of education seekers
The impact of digital content	Consumption of information from Instagram, TikTok, Facebook, which broadcast idealised images of a successful life, beauty, wealth, and achievements	Creating a distorted picture of reality; subconscious orientation to other people's standards	Frequent use of filters, an attempt to imitate the "ideal" lifestyle
Perception of idealised happiness	Awareness and internalisation of ideas about happiness as a necessary condition for success, wealth, and external attractiveness	The emergence of cognitive dissonance between the real and desired "digital" image	Statements about "lack of fulfilment", "not the same life as others"
Social comparison	Awareness and internalisation of ideas about happiness as a necessary condition for success, wealth, and external attractiveness	Feelings of inferiority, social pressure; envy, dissatisfaction with one's own life	Decreased mood after viewing other people's content; fixation on the successes of others
Emotional reaction	Psycho-emotional consequences of digital idealisation – anxiety, decreased mood, feelings of loneliness	Increased fatigue, decreased psycho-emotional tone, worsening of internal state	Statements about fatigue, stress; seeking emotional support; decreased activity in studies
Changing the level of self-esteem	Formation or deformation of self-esteem based on consumed digital content and reaction to one's own "online representation"	Dependence of self-esteem on likes, comments; risk of developing internal instability	Frequent posts for the purpose of self-affirmation; comments about insecurity; excessive photo editing, rejection of authenticity

Source: created by the author

The presented model has practical significance for the development of educational, psychological, and preventive programmes aimed at fostering a critical attitude towards digital content among students. The author's model of the influence of digital idealisation of happiness on the psycho-emotional state of students (Table 3) holds particular relevance for encouraging self-reflection, preventing emotional burnout, and promoting the development of digital hygiene skills within the youth environment. The first step in applying this model is the recognition of the influence exerted by digital content. Students are encouraged to conduct a critical analysis of the media they consume – especially on platforms where visual idealisation is prevalent, such as Instagram and TikTok. For example, a daily feed saturated with images of luxury and success may create a distorted perception of what constitutes a normal life. A practical recommendation is to establish digital boundaries – such as limiting social media usage to one hour per day or utilising "digital wellbeing" tools that track online activity. The second component involves identifying the

moment of perception of the idealised image of happiness. Students should engage in self-reflection to assess whether their understanding of happiness is authentic – rooted in their own values and needs – or shaped by external influences, social expectations, or stereotypes. In this context, exercises aimed at developing emotional intelligence can be beneficial – for instance, keeping a personal journal to record one's achievements, emotions, and moments of joy independently of external approval or comparison.

The third element, social comparison, requires particular attention. Educators and psychologists should incorporate media literacy and critical thinking training into the educational process, focusing on the analysis of comparison mechanisms within social networks. For example, a student may come to realise that the "successful image" projected by a blogger is often the product of a marketing team and carefully staged photographs, rather than a reflection of genuine happiness. The fourth component – emotional reaction – necessitates the introduction of self-help practices such as regular physical activity, breathing

techniques, and information “detoxes”. Students should be encouraged to monitor their emotional state after engaging with social media, noting whether feelings of anxiety, discouragement, or fatigue arise. Such responses can serve as indicators that digital habits need to be adjusted. Finally, the fifth stage – self-assessment – is closely linked to one’s digital self-representation. It is recommended that educational seminars be held on the theme of “authenticity in social networks”, including discussions on “like traps”. For example, if a student’s emotional state becomes dependent on the number of reactions to a post, this may be a signal to reassess their reliance on external validation. The model ultimately aims to foster emotional resilience and the development of a personal value system that is independent of digital representation and external approval.

Thus, the model not only systematises the phenomena associated with the digital idealisation of happiness, but also provides a framework for concrete actions aimed at reducing the risks of psycho-emotional disorders in the digital age. Social networks play a central role in the construction, dissemination, and reinforcement of idealised notions of happiness within the digital environment. They function not merely as platforms for information exchange, but as powerful instruments for shaping cultural norms, emotional expectations, and behavioural models. Through the use of personalisation algorithms, users are presented with content that affirms pre-existing perceptions of a “normal” life – typically characterised by visually appealing imagery, positive vocabulary, and aesthetically curated posts. Social networks thus cultivate an environment in which happiness is portrayed as a socially desirable product, requiring continuous visual validation through posts, likes, and comments. Within this context, emotional authenticity is frequently supplanted by the pursuit of social approval. Moreover, these platforms intensify social comparisons, fostering feelings of inadequacy, missed opportunities, and ultimately, emotional exhaustion. As such, social networks not only propagate ideals of happiness, but also define the parameters of social success – transforming personal experience into public performance and significantly influencing the psycho-emotional state of users.

■ DISCUSSION

In the context of active engagement with social networks, students were increasingly exposed to unproductive social comparisons, which resulted in emotional exhaustion, anxiety, and, in some cases, symptoms of depression. This finding aligns with the observations of S. Jiang & A. Ngien (2020), who noted that Instagram use – particularly when driven by social comparison – negatively impacted self-esteem and heightened social anxiety. The results of this study are significant in the context of shaping both the digital learning environment and students’ personal development. It was found that the digital idealisation of happiness – specifically, the portrayal of an ideal life on social media – led to a distorted perception of reality. This supports the findings of D. Graciyal & D. Viswam (2021),

who argued that the virtual pursuit of happiness often supplants genuine emotional well-being, transforming it into a quest for instant gratification and social approval. As a result, students became increasingly vulnerable to feelings of self-dissatisfaction and discontent with their lives. Furthermore, the study by F. Ekşi *et al.* (2020) emphasised that problematic technology use during adolescence is correlated with impaired social functioning, heightened anxiety, and reduced self-esteem. These parallels underscore the universality of the trends identified in the present study, regardless of sociocultural context. At the same time, the study revealed differences in the impact of digital idealisation of happiness depending on students’ levels of digital literacy and critical thinking. Students with higher digital competence exhibited reduced emotional vulnerability to idealised social media imagery.

This corresponds with the findings of Y. Chen & Q. Gao (2023), who demonstrated that social confidence among social network users positively correlates with self-esteem and lowers feelings of loneliness. Additionally, it was found that the digital idealisation of happiness contributed to the development of inflated life expectations, which often resulted in emotional burnout. As noted by M. Gaudette *et al.* (2023), this phenomenon is not limited to students but extends to other vulnerable groups. A key outcome of this study was the observation of a shift in how students perceive happiness. It was frequently equated with visual indicators of success – such as travel, physical appearance, or the number of likes received. This finding is consistent with a broader trend; however, it contrasts with the results of M. Hasan & N. Neela (2022), who explored the electronic self-presentation of tourists as a means of enhancing self-esteem. The present study demonstrated the opposite effect, highlighting the importance of context – particularly when digital content is not created by the students themselves but merely consumed, thereby negatively affecting their emotional state and self-esteem. The consistency of the results with the ethical considerations raised by C. Burr *et al.* (2020), who conducted an analysis of digital well-being, reinforces the necessity of adopting a critical perspective towards the digital environment. According to these authors, digital well-being should be grounded in a careful balance between the benefits offered by digital technologies and the preservation of individuals’ psycho-emotional health. The findings of the current study further underscore the importance of maintaining this balance, especially within the educational context.

Particular attention was paid to music as a means of emotional regulation within the digital environment. X. Hu *et al.* (2021) found that students actively used music to improve their psycho-emotional state – an observation partially confirmed in the analysed material, where some students reported turning to musical content as a compensatory resource in response to stress caused by digital comparisons. The experience of the COVID-19 pandemic also influenced the perception of happiness in the digital space. A study by P. Bhatia *et al.* (2024), which focused

on elderly migrants, emphasised that social isolation and the instability of the external environment increased the demand for online support, while simultaneously exacerbating psycho-emotional discomfort. Among students, the idealisation of digital happiness during periods of social distancing intensified feelings of alienation. Similar conclusions were drawn in the study by J. Lee (2022), which found that social comparisons in the digital environment indirectly impact psychological well-being through alterations in self-esteem and perceived social support. Likewise, the research of S. Jiang & A. Ngien (2020) emphasised that active Instagram use contributes to increased social anxiety, particularly among individuals with a strong tendency toward social comparison. These findings confirm that the issue of digital idealisation is systemic and manifests independently of geographical or cultural context. Furthermore, the study revealed that aesthetic pressure – generated through portrayals of the ideal body and appearance – led to widespread dissatisfaction with personal appearance among students, which negatively influenced their overall psycho-emotional well-being. Comparable results were reported by M. Merino *et al.* (2024), who concluded that social media usage negatively affects body satisfaction and mental health, especially when viewed through the lens of gender and cultural differences. Similarly, A. Vizcaíno-Verdú *et al.* (2025) highlighted the connection between digital image editing, body dissatisfaction, and reduced well-being – findings that fully align with the outcomes of this study.

Another important theme of the study was the role of self-esteem as a mediator between digital idealisation and emotional well-being. Observations confirmed that students with higher levels of self-esteem were less sensitive to idealised digital imagery and less likely to exhibit negative emotional reactions. This finding aligns with the research of N. Nawa & N. Yamagishi (2024), who demonstrated that high self-esteem, combined with feelings of gratitude, contributes to greater levels of subjective and psychological well-being. Similar results were reported by Y. Chen & Q. Gao (2023), who found that the social confidence of social media users was positively associated with self-esteem and correlated with reduced levels of loneliness. Within the framework of the present study, it was also observed that students with higher digital competence and stronger critical thinking skills were less likely to compare themselves with idealised images and more inclined to utilise psychological self-defence mechanisms – particularly emotional regulation and cognitive restructuring. The findings further confirmed that prolonged exposure to a digitally idealised environment fosters inflated expectations from life. These expectations, when misaligned with reality, often led to chronic disappointment, emotional burnout, and demotivation. Comparable phenomena were previously described by G. Tamba & I. Iancu (2023), who noted that digital communication – especially text-based interactions – can provoke feelings of loneliness and decreased self-esteem among young people.

Similarly, A. Pearce (2024) argued that technological oversaturation contributes to cognitive overload, reduced intellectual satisfaction, and emotional imbalance. These insights are consistent with findings from the present study, in which students reported comparison fatigue, information overload, and a persistent desire for external validation. Another key aspect examined was the relationship between digital behaviour and well-being. Impulsive digital activities – such as online shopping, posting, or liking – were frequently associated with lower life satisfaction. This was supported by the study of S. Olsen *et al.* (2022), which found that impulsive online behaviour was linked to feelings of inner emptiness, mediated by levels of self-esteem. Even among students who were actively engaged in digital activities, many reported feelings of dissatisfaction, apathy, or underlying anxiety. The findings of O. Starovoitenko (2025) regarding the mental health risks associated with cybersecurity protocols in the workplace highlight a broader pattern in which technical demands create significant psychosocial stress, a dynamic mirrored in the current study's findings regarding the emotional toll of digital idealisation. Nevertheless, some participants noted compensatory strategies that helped mitigate the negative effects of digital idealisation. The most common among these were listening to music, using self-irony, maintaining communication with close friends and family, and limiting time spent on social media.

These findings correlate with the study by X. Hu *et al.* (2021), which confirmed that music consumption helps reduce stress and supports psychological balance among students. The emotional tone of digital content also emerged as a significant factor. As noted by S. Steinert & M. Dennis (2022), social networks possess so-called “emotional affordances” – features that influence users’ emotional states depending on the context and form of content. Particular attention in the study was devoted to the aspect of trust in digital technologies. Some respondents reported that interaction with digital tools – particularly artificial intelligence – affected their sense of self-worth. Similar conclusions were drawn by M. Salah *et al.* (2024), who emphasised the importance of users’ perceptions of chatbots and digital assistants in relation to self-esteem and psychological well-being. Overall, the digital environment not only introduces new standards for happiness but also directly influences the perception of one’s own value. The findings of E. Diener *et al.* (2003) and C. Tripon *et al.* (2023) further demonstrated that the interpretation of happiness is deeply rooted in educational traditions and cultural context.

Summarising the results of the study, it can be concluded that self-esteem serves as a key mediator in the relationship between digital idealisation and the emotional well-being of students. Higher self-esteem mitigates the negative effects of exposure to idealised images, reduces anxiety, and supports the development of adaptive self-regulation strategies. Conversely, a low level of self-esteem – when combined with high digital activity and an uncritical

perception of content – increases the risk of emotional exhaustion, loneliness, and diminished subjective well-being. Students with greater digital literacy and elements of critical thinking are more inclined to employ compensatory strategies, such as listening to music, using self-irony, engaging in communication, or setting time limits for internet use. This suggests a clear potential for fostering psychological resilience within the digital environment.

■ CONCLUSIONS

The study confirmed that happiness in the educational environment is multidimensional and plays a crucial role in shaping the student's personality, as well as in ensuring a successful educational process. The key components of happiness – subjective well-being, life satisfaction, self-realisation, and social support – are interrelated and complementary, forming a holistic psycho-emotional foundation essential for personal development. Providing a supportive educational environment, encouragement from teachers, and opportunities to pursue individual learning trajectories all contribute to students' emotional stability and the development of positive self-esteem. Social support from family, peers, and academic staff also serves as a vital resource for coping with stress and fostering motivation for achievement.

The digital culture prevalent among modern youth significantly transforms traditional perceptions of happiness. An analysis of public accounts of young users in Kyrgyzstan shows that digital idealisation, social comparison, and online self-representation are shaping new standards of happiness – standards increasingly tied to visual appeal, social recognition, and measurable indicators of success. This digital environment places additional pressure on young people, encouraging them to maintain a positive image even in moments of stress or emotional exhaustion. Visual depictions of travel, personal achievements, and lifestyle choices are often used to convey status and success, potentially leading to emotional discomfort due to persistent

social comparison. Psycho-emotional markers evident in users' content – including inspiration, happiness, fatigue, and stress – reflect the complex influence of digital culture on personality. The vocabulary used on social networks is rich in positive emotional expressions, fostering an atmosphere of support and community. However, the dominance of idealised imagery and repetitive patterns in messaging can hinder authentic communication and diminish empathy, concealing the negative emotions and challenges that are an inherent part of life. This dynamic contributes to an illusion of a perfect life and shifts value orientations – where genuine happiness is increasingly replaced by its digital validation through likes and comments.

Thus, the modern educational process and digital space intersect in shaping young people's understanding of happiness. This highlights the importance of a comprehensive approach to student support – one that considers both psychological well-being and a critical perspective on digital representations. A deeper understanding of the multidimensional nature of happiness and the effects of digital idealisation can aid in fostering a healthier educational environment, where students feel valued and accepted in real life, not solely through their virtual presence. Prospective areas for future research may include examining the influence of economic and political factors on students' digital behaviour, as well as conducting comparative studies across different Central Asian countries to identify regional distinctions and broader trends.

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Бактылуулукуту санариптик идеалдаштыруунун билимге умтулган адамдардын эмоционалдык абалына жана өзүн-өзү сыйлоосуна тийгизген таасири

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Аннотация. Изилдөөнүн максаты билимге умтулган адамдар арасында социалдык тармактарда бакыттын санариптик идеализациясынын өзгөчөлүктөрүн аныктоо болгон. Санариптик чөйрөдө бакыт концепциясын изилдөө методологиясына дисциплиналар аралык адабияттарды комплекстүү талдоо, санариптик маданияттын таасири астында концепциянын трансформациясынын теориялык жалпылоосу (айрыкча Instagram, TikTok жана Facebook социалдык тармактарында) жана жаштардын коомдук аккаунттарынын контент-анализи, санариптик идеализация жана онлайн өзүн-өзү комплекттөө көрүнүштөрүнө басым жасалган. Изилдөө көрсөткөндөй, Кыргызстандын жаштары үчүн санариптик чөйрөдө ийгилик санариптик идеалдаштыруунун, социалдык салыштыруунун жана интернетте өзүн-өзү көрсөтүүнүн татаал өз ара аракеттенүүсүнүн таасири астында калыптанат. Жаш колдонуучулар материалдык жетишкендиктерге, саякатка, карьералык ийгиликке жана жигердүү жашоо образына басым жасаган мазмунду жарыялап, ошону менен идеалдуу бакыт идеясын түзөрү аныкталган. Мындан тышкары, бул контент көбүнчө позитивдүү тил, метафоралар, гиперболалар жана хэштегдер менен коштолуп, эмоционалдык таасирди күчөтүп, аудиториянын жогорку деңгээлде катышуусуна өбөлгө түзөрү белгиленди. Ошол эле учурда, бул кабыл алынган стандарттарга жооп берүү үчүн жаштарга кошумча басымды жаратат, бул көп учурда чыныгы жашоо менен санариптик “кемчиликсиздиктин” ортосундагы дал келбегендиктен улам когнитивдик диссонанска жана стресске алып келет. Изилдөө ошондой эле аудиториянын реакциялары ийгиликтин санарип тастыктоосунун маанилүүлүгүн жогорулатып, баалуулуктардын чыныгы бакыттан анын виртуалдык өкүлчүлүгүнө өтүшүнө алып келери аныкталган. Бул көрүнүш өзүн-өзү ишке ашыруу аракетинде гана эмес, эмоционалдык чарчоо, тынчсыздануу, социалдык сезимталдыктын жогорулашында да көрүнөт. Изилдөөнүн жыйынтыгы көрсөткөндөй, Кыргызстандын жаштарынын санариптик чөйрөдө ийгиликке болгон көз карашына социалдык салыштыруу менен шартталган бакыттын идеалдаштырылган виртуалдык образы, интернеттеги позитивдүү өзүн-өзү көрсөтүү жана санарип тастыктоодон көз карандылык таасир этет. Бул изилдөөнүн практикалык мааниси билим берүү мекемелери, психологдор жана социалдык кызматкерлер тарабынан санариптик гигиена, критикалык ой жүгүртүү жана санариптик мейкиндикте багыт алган жаштар үчүн психоэмоционалдык колдоо боюнча программаларды иштеп чыгуу үчүн потенциалдуу колдонууда.

Негизги сөздөр: эмоционалдык жыргалчылык; виртуалдык сүрөттөр; психологиялык дискомфорт; социалдык салыштыруулар; технологиянын таасири

Влияние цифровой идеализации счастья на эмоциональное состояние и самооценку людей, стремящихся получить образование

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Аннотация. Целью исследования было выявление характеристик цифровой идеализации счастья в социальных сетях среди лиц, стремящихся получить образование. Методология исследования концепции счастья в цифровой среде включала комплексный анализ междисциплинарной литературы, теоретическое обобщение трансформации концепции под влиянием цифровой культуры (особенно в социальных сетях Instagram, TikTok и Facebook) и контент-анализ публичных аккаунтов молодых людей с акцентом на явления цифровой идеализации, социального сравнения и онлайн-самопрезентации. Исследование показало, что успех в цифровой среде для молодежи в Кыргызстане формируется под влиянием сложного взаимодействия цифровой идеализации, социального сравнения и самопрезентации в Интернете. Было установлено, что молодые пользователи публикуют контент, в котором подчеркиваются материальные достижения, путешествия, карьерный успех и активный образ жизни, тем самым создавая идеализированное представление о счастье. Кроме того, было отмечено, что этот контент часто сопровождается позитивной лексикой, метафорами, гиперболами и хэштегами, которые усиливают эмоциональное воздействие и способствуют высокому уровню вовлеченности аудитории. Одновременно это создает дополнительное давление на молодых людей, стремящихся соответствовать этим воспринимаемым стандартам, что часто приводит к когнитивному диссонансу и стрессу из-за несоответствия между реальной жизнью и цифровой «идеальностью». Исследование также показало, что реакция аудитории повышает воспринимаемую важность цифрового подтверждения успеха, что приводит к сдвигу ценностей от подлинного счастья к его виртуальному представлению. Это явление проявляется не только в попытках самореализации, но и в эмоциональной усталости, тревоге и повышенной социальной чувствительности. Результаты исследования показали, что восприятие успеха среди молодежи в Кыргызстане в цифровой среде формируется под влиянием идеализированного виртуального образа счастья, обусловленного социальным сравнением, позитивным самопредставлением в Интернете и зависимостью от цифрового подтверждения. Практическое значение данного исследования заключается в его потенциальном применении образовательными учреждениями, психологами и социальными работниками для разработки программ по цифровой гигиене, критическому мышлению и психоэмоциональной поддержке молодых людей, ориентирующихся в цифровом пространстве.

Ключевые слова: эмоциональное благополучие; виртуальные образы; психологический дискомфорт; социальные сравнения; влияние технологий



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AIGC-driven transformation of international Chinese language education in Kyrgyzstan

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Abstract. This study investigated the integration of Artificial Intelligence Generated Content technologies with Second Language Acquisition principles to enhance personalised Chinese language learning for non-native speakers, focusing on Kyrgyzstan within the Belt and Road Initiative framework. The research employed a mixed-methods approach, combining comprehensive evaluations of three platforms (ChatGPT, DeepSeek, and Doubao), semi-structured interviews with educational experts, and theoretical analysis grounded in established theories including Krashen's Input Hypothesis and Long's Interaction Hypothesis. Platform assessments demonstrated varying capabilities across critical dimensions, with DeepSeek showing superior language processing performance. Expert interviews identified three primary mechanisms for personalised learning: adaptive content generation, individualised progress tracking, and immediate feedback delivery. However, cultural adaptability emerges as a significant challenge, revealing limitations in addressing sociocultural learning contexts that require human pedagogical expertise. The study developed a strategic four-phase implementation framework addressing key barriers including technical infrastructure constraints, teacher preparedness gaps, and economic limitations. Cultural bridging strategies were proposed to connect Chinese language content with local contexts, providing replicable models for diverse Belt and Road Initiative regions. The research demonstrated Artificial Intelligence Generated Content's potential to augment rather than replace human instruction through intelligent content creation and adaptive learning pathways. While acknowledging methodological limitations including sample size constraints and absence of direct learner outcome measurements, the findings established a foundation for sustainable, culturally responsive technology integration in international Chinese language education

Keywords: language learning theories; AIGC technology; Chinese instruction; educational model reform; technology in pedagogy

■ INTRODUCTION

The accelerating pace of globalisation and China's expanding international influence, particularly through the Belt and Road Initiative (BRI), positioned international Chinese language education at a critical juncture, marked by unprecedented opportunities and significant challenges. The global demand for Chinese language proficiency surged, driven by academic, professional, and cultural aspirations. This trend was particularly pronounced in BRI partner countries such as Kyrgyzstan, where economic ties and cultural exchanges with China deepened. L. Xie & M. Gunaban (2024) identified resource shortages as a primary barrier to Chinese language instruction in Central Asia,

providing a contextual foundation for examining technology-driven solutions in the present investigation. Similarly, C. Wang *et al.* (2024) underscored the necessity for advanced language skills in cross-cultural communication within BRI economic frameworks, highlighting the urgency for innovative pedagogical approaches tailored to these regions. Conventional pedagogical models often struggled to accommodate learner diversity, provide personalised instruction, or address region-specific needs, such as limited access to qualified teachers and culturally relevant materials in Central Asia. Y. Lai (2024) demonstrated that traditional approaches frequently failed to adapt to the

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distinct linguistic backgrounds of learners in non-native contexts, resulting in inefficiencies in language acquisition. This challenge was compounded in resource-constrained environments like Kyrgyzstan, where infrastructure limitations further restricted access to quality education, as S. Zhypar (2024) pointed out in an analysis of local educational barriers. These gaps accentuated the pressing need for adaptive and scalable solutions to enhance global Chinese language education.

Artificial Intelligence Generated Content (AIGC) technology emerged as a promising avenue for educational reform by enabling personalised learning resources, real-time feedback, and immersive learning environments. L. Chen *et al.* (2020) established that AIGC tools addressed pedagogical challenges in contexts with limited resources by automating content creation and feedback mechanisms, a finding that shaped the evaluation framework for this study. This potential was particularly relevant for Chinese language instruction, given its unique features such as tonal phonology and logographic script, which posed significant difficulties for learners with dissimilar native languages, as Y. Aini *et al.* (2025) illustrated through their examination of learner challenges in non-tonal linguistic backgrounds. However, despite growing interest in AIGC applications, research integrating these technologies with Second Language Acquisition (SLA) theory in the context of international Chinese education, especially within BRI regions, remained scarce. F. Song *et al.* (2023) argued that this research gap was critical, as the complex linguistic and cultural landscape of Chinese language learning in Central Asia demanded specialised instructional approaches, a perspective that directly informed the focus of this investigation. Additionally, W. Holmes & I. Tuomi (2022) provided evidence on the broader transformative potential of AI in education, cautioning against ethical risks such as data privacy, which further guided the ethical considerations in this study.

The aim of this study was to address the identified gap by investigating how AIGC technologies could be aligned with SLA principles to enhance Chinese language acquisition, innovate teaching practices, and overcome the unique challenges faced in international Chinese language education, with a particular focus on Kyrgyzstan as a representative BRI context. Through this exploration, the study sought to contribute to both theoretical understanding and practical implementation of AIGC in diverse educational settings.

■ LITERATURE REVIEW

The integration of artificial intelligence (AI) in language education emerged as a pivotal area of research, reflecting the global shift towards digitalisation in learning environments. AIGC and related technologies gained recognition for their transformative potential in enhancing language instruction, particularly in underrepresented regions such as Central Asia within the BRI framework. This section reviews existing literature across key themes: AI applications in language education, alignment with SLA theory, and specific challenges in international Chinese language

education. A substantial body of research highlighted the capacity of AI to personalise instruction and streamline learning processes. E. Kasneci *et al.* (2023) provided evidence on the personalisation potential of large language models (LLMs), demonstrating their ability to tailor content to individual learner needs and adapt learning pathways. However, their caution against algorithmic bias and privacy concerns informed the ethical evaluation criteria adopted in the platform assessments conducted for this study. L. Chen *et al.* (2020) further illustrated that AI applications targeting pronunciation and vocabulary acquisition improved learning efficiency through immediate feedback, though R. Godwin-Jones (2022) countered that such tools often neglected pragmatic competence and cultural fluency, a limitation that guided the emphasis on holistic learning outcomes in this research. Ethical challenges, including data security and linguistic bias, remained underexplored, as F. Aljabr & A. Al-Ahdal (2024) noted, prompting the inclusion of ethical considerations in the study design.

SLA theory remained a cornerstone for language teaching methodologies, though its practical application faced constraints. While foundational works by H. Brown (2007) and R. Ellis (2015) documented key frameworks like Krashen's Input Hypothesis, P. Lightbown & N. Spada (2021) observed that limited resources and teacher expertise often hindered implementation in non-traditional environments, a challenge central to this study's context in Kyrgyzstan. AIGC offered opportunities to bridge this gap, as A. Betal (2023) suggested that AI platforms simulated natural language input and interaction, aligning with SLA principles. J. Tu (2020) further argued that AIGC tools operationalised theoretical concepts by providing comprehensible input, though their learner-specific alignment required validation, a gap that this research aimed to address through empirical testing. F. Song *et al.* (2023) added that consistency between AI-generated content and SLA concepts like affective factors was rarely evaluated in specific language contexts, influencing the theoretical framework developed for this investigation.

Research on AIGC applications in international Chinese language education revealed significant gaps. Y. Aini *et al.* (2025) noted that most studies focused on general or English-oriented frameworks, overlooking the unique linguistic features of Chinese, such as tonal phonology, a finding that shaped the focus on language-specific challenges in this study. S. Jiang & J. He (2025) highlighted that learners with dissimilar native languages faced distinct barriers, often ignored in AI research, prompting an emphasis on cross-linguistic issues in the BRI context. X. Liu-Schuppener (2023) and W. Zhang & H. Dou (2025) explored AIGC in Chinese vocational education, yet broader pedagogical issues in international settings remained underexamined, as B. Xu (2024) pointed out for resource-constrained BRI regions.

Y. Xie *et al.* (2019) suggested that immersive technologies like Virtual Reality held promise for cultural learning, though practical application in Chinese education remained limited, shaping the call for innovative solutions

here. Teacher training for AIGC integration represented another challenge, as X. Tan *et al.* (2025) identified a lack of digital literacy among educators, a barrier considered in the implementation strategies proposed. C. Zhang (2024) and S. Yu *et al.* (2025) further highlighted scalability and accessibility issues in resource-limited environments, aligning with G. Stockwell (2012) and J. Richards & T. Rodgers (2014) on the need to balance technological innovation with pedagogical goals, a principle central to the practical focus of this investigation. In summary, while AI and AIGC presented significant opportunities for language education, systematic research on their integration into international Chinese language education from an SLA perspective remained insufficient. The linguistic and cultural complexities of Chinese, alongside practical challenges in BRI contexts, necessitated targeted exploration, which this study aimed to provide through a focus on Kyrgyzstan as a representative case.

■ MATERIALS AND METHODS

This study employed a mixed-method approach to evaluate the integration of AIGC technologies into international Chinese language education, focusing on Kyrgyzstan within the BRI context. The methodology encompassed three key components: a systematic literature review, semi-structured expert interviews, and platform performance evaluations. A systematic review of academic publications was conducted to establish a theoretical foundation. Databases such as CNKI, Web of Science, and Google Scholar were searched using terms like AIGC, artificial intelligence, Chinese language education, and Belt and Road Initiative. Over 150 articles were screened, prioritising studies on AI applications in language learning and Central Asian educational contexts. Selected 33 studies were analysed to extract insights on SLA principles and technology integration in pedagogy.

Semi-structured interviews were conducted with eight experts in Chinese language teaching and educational technology between December 2024 and May 2025. The purposively selected sample was designed to ensure comprehensive coverage of relevant expertise areas and geographical contexts within the BRI framework. Expert selection criteria included: (1) minimum five years of experience in Chinese language education or educational technology; (2) demonstrated expertise in Central Asian educational contexts or cross-cultural language instruction; and (3) current involvement in international Chinese language education programmes. The expert panel comprised four university lecturers experienced in Central Asia (Experts A, B, C, and D), two educational technology specialists (Experts E and F), and two practitioners teaching Chinese to Turkic learners (Experts G and H). Interviews were conducted through both face-to-face meetings and online sessions via Zoom, with each 60-minute interview being audio-recorded following explicit participant consent. Ethical standards were upheld through informed consent procedures, participant anonymity protection, and secure data storage protocols per institutional guidelines (American

Sociological Association's Code of Ethics, 2018). The interview protocol consisted of three main sections: (1) assessment of AIGC potential for personalised Chinese language instruction; (2) evaluation of cultural adaptation challenges specific to Kyrgyzstan and Central Asian contexts; and (3) identification of implementation barriers and strategic solutions. Questions were pilot-tested with two additional experts not included in the final sample to ensure clarity and comprehensiveness.

All interview responses were transcribed verbatim and imported into NVivo 12 software for systematic thematic analysis. The coding process followed a hybrid approach, combining deductive codes derived from Second Language Acquisition theory and inductive codes emerging from the data. To ensure reliability, data coding involved three independent researchers who achieved an inter-rater reliability coefficient of 0.89 using Cohen's kappa. Discrepancies were resolved through discussion and consensus, enhancing the consistency and validity of identified themes. The final coding scheme encompassed 12 primary themes and 34 sub-themes, providing a comprehensive framework for understanding expert perspectives on AIGC integration in international Chinese language education.

The suitability of AIGC platforms for Chinese language education was assessed using ChatGPT (OpenAI, GPT-4.1 model), DeepSeek (DeepSeek-V3), and Doubao (ByteDance, Doubao-Large model) between December 2024 and May 2025. Evaluation criteria, aligned with SLA principles and Kyrgyz learner needs, included five dimensions: language processing accuracy (e.g., tone and character recognition), cultural adaptability to Central Asian contexts, personalised learning support, feedback quality, and user interface usability. Platforms were tested through simulated teaching scenarios, scored on a 5-point scale per criterion, and triangulated with expert feedback for validity. The assessment focused on platform capabilities as evaluated by the research team, without direct learner involvement. Artificial intelligence tools were employed solely as supportive instruments during the research process. The full responsibility for the conceptualisation, analysis, and conclusions presented in this article rests entirely with the author.

■ RESULTS

AIGC platform performance capabilities for enhanced Chinese language instruction

The comprehensive evaluation of ChatGPT, DeepSeek, and Doubao revealed distinct pedagogical strengths that address specific challenges in Chinese language instruction within resource-constrained environments like Kyrgyzstan. Each platform demonstrated unique capabilities that align with different aspects of language learning theory and practical classroom needs, providing educators with complementary tools for enhanced instruction. The comparative analysis of platform performance across five critical dimensions demonstrates significant variations in capabilities, with overall scores ranging from 3.8 to 3.9 out of 5.0, indicating generally strong but differentiated performance

profiles (Table 1). These findings, compiled from expert evaluations and systematic platform testing conducted between December 2024 and May 2025, achieved high

reliability coefficients ranging from 0.87 to 0.94 across evaluation dimensions, confirming the robustness of the assessment framework.

Table 1. Comprehensive AIGC platform performance evaluation

Platform	Language processing	Cultural adaptability	Personalised learning	Feedback quality	User interface	Overall score
ChatGPT	4.2/5.0	3.4/5.0	3.8/5.0	3.2/5.0	4.3/5.0	3.8/5.0
DeepSeek	4.6/5.0	3.1/5.0	4.2/5.0	4.1/5.0	3.3/5.0	3.9/5.0
Doubao	4.1/5.0	3.6/5.0	4.4/5.0	3.5/5.0	3.9/5.0	3.9/5.0

Source: compiled by the author

ChatGPT demonstrated exceptional performance in conversational content generation and user accessibility, achieving notable scores of 4.2/5.0 for language processing accuracy and 4.3/5.0 for user interface usability. The platform's strength lies in its ability to generate diverse, contextually appropriate dialogue materials at scale. Testing revealed its capacity to produce hundreds of unique conversation scenarios within minutes, covering topics from basic daily interactions to complex business negotiations relevant to BRI contexts. The platform's multilingual support and intuitive interface design make it particularly accessible to educators with varying levels of technological expertise, a crucial factor for adoption in multilingual educational environments like Kyrgyzstan. However, ChatGPT's limitations became apparent in systematic error detection and cultural adaptation. The platform scored 3.2/5.0 for feedback quality, indicating challenges in providing targeted corrective guidance that addresses specific learner needs. Its cultural adaptability score of 3.4/5.0 reflects difficulties in generating content that resonates with Central Asian cultural contexts, often defaulting to Han Chinese cultural references that may lack relevance for Kyrgyz learners.

DeepSeek distinguished itself through superior Chinese language processing capabilities, achieving the highest scores in language accuracy (4.6/5.0) and feedback quality (4.1/5.0). The platform's training on extensive Chinese corpora enables remarkably precise character recognition, grammatical analysis, and error detection. Systematic testing revealed its exceptional ability to identify cross-linguistic interference patterns, particularly those characteristic of Kyrgyz-Chinese language pairs, such as Subject-Object-Verb (SOV) word order transfer and tonal discrimination challenges. The platform's personalised learning support capabilities, scoring 4.2/5.0, demonstrated sophisticated content adaptation mechanisms that automatically adjust vocabulary density, sentence complexity, and grammatical structures based on learner performance indicators. This adaptive functionality represents a significant advancement over static educational materials, providing dynamic content that responds to individual learning trajectories. However, DeepSeek's user interface scored lower (3.3/5.0), reflecting a more technical design that

may present accessibility challenges for less technologically proficient educators.

Doubao excelled in multimodal content integration and learner engagement, achieving the highest score for personalised learning support (4.4/5.0) and the strongest performance in cultural adaptability (3.6/5.0). The platform's ability to coordinate text, audio, and visual elements creates immersive learning experiences that address diverse learning styles simultaneously. Its multimodal approach proves particularly effective for Chinese character acquisition, where visual-spatial processing remains crucial for learner success. Testing revealed Doubao's superior capability in generating culturally diverse content scenarios compared to other platforms, incorporating references to Central Asian contexts and BRI-related situations more naturally. This cultural sensitivity, while still limited, represents meaningful progress toward more inclusive content generation that acknowledges learners' diverse backgrounds and motivations for Chinese language study. The triangulation process revealed strong correlation between quantitative scores and qualitative assessments, with reliability coefficients ranging from 0.87 to 0.94 across different dimensions, confirming the accuracy of the evaluation framework and providing confidence in the comparative analysis.

Expert perspectives on personalised learning facilitation and implementation barriers

Building upon the platform performance evaluation, expert analysis provided crucial insights into how AIGC capabilities translate into practical educational benefits and the challenges that must be overcome for successful implementation. The systematic thematic analysis of semi-structured interviews with eight carefully selected experts revealed remarkable consistency in perspectives, demonstrating the robustness of findings across diverse expertise areas and geographical contexts within the BRI framework. The comprehensive analysis using NVivo 12 software identified 12 primary themes emerging from 103 coded segments across all interviews, with inter-rater reliability achieving Cohen's $\kappa = 0.89$, confirming the validity of identified themes. The analysis revealed three overarching meta-themes: Technological Affordances (encompassing platform capabilities

and technical barriers), Pedagogical Transformation (including personalised learning and cultural adaptation), and Implementation Ecology (covering institutional barriers and scalability considerations). These findings directly

address the research objectives by providing expert validation of platform capabilities while identifying critical implementation considerations for Central Asian educational contexts (Table 2).

Table 2. Expert interview thematic analysis results

Primary theme	Sub-themes	Expert frequency	Coded segments	Representative quote
Personalised learning mechanisms	4	8/8 (100%)	24	"AIGC platforms demonstrate remarkable ability to adjust content complexity..." (Expert D)
Technical infrastructure barriers	2	8/8 (100%)	18	"Inconsistent connectivity remains the primary obstacle..." (Expert F)
Cultural adaptation challenges	3	7/8 (87.5%)	15	"Platforms struggle with deeper cultural personalisation..." (Expert G)
Platform-specific capabilities	4	8/8 (100%)	14	"DeepSeek excels at error pattern recognition..." (Expert B)
Implementation strategies	3	7/8 (87.5%)	12	"Hybrid models leverage technological strengths..." (Expert E)
Teacher preparedness issues	3	6/8 (75%)	10	"Technology anxiety impacts adoption rates..." (Expert C)
Economic constraints	2	5/8 (62.5%)	10	"Budget limitations require phased approaches..." (Expert A)

Source: compiled by the author

When directly addressing the research question "How can AIGC tools facilitate personalised learning for non-native Chinese learners?", expert responses revealed three primary mechanisms that align closely with the quantitative platform evaluation findings. The most prominent theme, mentioned by all eight experts across 24 coded segments, centred on adaptive content generation capabilities. Expert D provided comprehensive analysis connecting platform evaluation findings: "AIGC platforms demonstrate remarkable ability to adjust content complexity, vocabulary frequency, and grammatical structures based on learner performance data. DeepSeek's high scores in language processing and personalised learning reflect sophisticated adaptation algorithms, while Doubao's multimodal capabilities create multiple pathways for content personalisation."

The second major theme, individual progress tracking and adaptive pathways, emerged in 18 coded segments across six experts, directly validating the personalised learning dimension assessed in the platform evaluation. Expert F explained how this addresses regional challenges: "AIGC platforms excel at continuous assessment and pathway modification, providing learners with immediate feedback and redirecting study focus based on performance patterns. This capability proves particularly valuable in Kyrgyzstan where teacher-student ratios often exceed optimal levels for individual attention." DeepSeek's superior feedback quality performance (4.1/5.0) enables sophisticated error pattern recognition, as Expert A detailed: "When Kyrgyz students consistently produce SOV word order in Chinese sentences, DeepSeek recognises this as L1 interference

rather than random error, providing targeted explanations and practice exercises."

The third theme, immediate feedback and corrective guidance, was universally mentioned by all experts across 16 coded segments, corroborating the feedback quality assessments in the platform evaluation. Expert B emphasised how this addresses persistent challenges: "The immediate feedback capability tackles one of the most difficult aspects of Chinese language instruction, providing timely, accurate correction of learner errors. Traditional classroom settings often cannot accommodate the intensive feedback requirements of Chinese language learning, particularly for tonal and character production."

However, expert analysis also revealed significant limitations that complement and validate the quantitative findings. The moderate cultural adaptability scores across all platforms (3.1 to 3.6/5.0) reflect deeper challenges consistently identified across 15 coded segments. Expert G noted: "While AIGC platforms excel at surface-level personalisation, they struggle with deeper cultural and motivational personalisation that accounts for learners' cultural backgrounds and learning goals." This expert insight directly explains the relatively lower cultural adaptability scores observed in the platform evaluation, providing crucial context for understanding these quantitative results. The expert consultation process also addressed implementation barriers and strategic solutions, fulfilling the research objective of identifying practical deployment strategies for resource-constrained environments. The systematic analysis revealed four primary barrier categories that must be addressed for successful AIGC integration in Central Asian educational contexts (Table 3).

Table 3. Expert-identified implementation barriers and strategic solutions

Barrier category	Specific challenges	Expert-recommended solutions	Implementation considerations
Technical infrastructure	Inconsistent connectivity, hardware limitations	Hybrid offline/online models, phased upgrades	Requires institutional planning
Cultural-linguistic adaptation	Limited cultural sensitivity, L1 interference gaps	Cultural bridging protocols, teacher mediation	Demands pedagogical expertise
Teacher preparedness	Technology anxiety, integration skills gaps	Enhancement-focused training, collaborative models	Needs comprehensive support
Economic constraints	Budget limitations, implementation costs	Phased adoption, cost-sharing strategies	Requires long-term planning

Source: compiled by the author

These expert findings demonstrate strong correspondence with the methodological framework established for this study. The purposive sampling of eight experts across diverse expertise areas (university lecturers experienced in Central Asia, educational technology specialists, and practitioners teaching Chinese to Turkic learners) ensured comprehensive coverage of relevant perspectives, while the systematic thematic analysis using NVivo 12 provided rigorous analytical validation. The high inter-rater reliability (Cohen's $\kappa = 0.89$) achieved through independent coding by three researchers confirms the robustness of identified themes and their alignment with the research objectives of evaluating AIGC potential and identifying implementation strategies for Central Asian contexts.

Theoretical alignment between AIGC capabilities and second language acquisition principles

The convergence of platform performance data and expert insights establishes a foundation for examining how AIGC technologies align with established Second Language Acquisition theoretical frameworks. This theoretical analysis reveals why certain platform capabilities prove effective while illuminating the pedagogical principles that must guide successful AIGC integration in Chinese language education. The adaptive content generation capabilities that experts universally identified as AIGC's primary strength find substantial theoretical support in Krashen's Input Hypothesis, which emphasises providing comprehensible input at the "i + 1" level, slightly beyond the learner's current proficiency. DeepSeek's sophisticated adaptation mechanisms, evidenced by its high personalised learning score (4.2/5.0) and validated through expert testimony, exemplify this theoretical alignment. Expert C's observation that "DeepSeek analyses learner performance metrics to modify vocabulary density and sentence complexity automatically, ensuring materials challenge learners without overwhelming them" directly operationalises Krashen's framework through automated calibration of input difficulty.

This technological implementation represents a significant advancement over static materials, providing dynamic adjustment that mirrors expert teacher intuition in maintaining optimal challenge levels. The platform's ability to recognise when intermediate Kyrgyz learners struggle with complex syntax and respond by reducing structural

complexity while gradually introducing new lexical items demonstrates sophisticated implementation of the "i + 1" principle. However, Expert D's caution reveals important limitations: "while platforms excel at adjusting linguistic complexity based on performance data, they often fail to account for affective factors that influence input comprehensibility," highlighting the gap between technological capability and Krashen's Affective Filter Hypothesis.

Long's Interaction Hypothesis, emphasising meaningful interaction and corrective feedback in language acquisition, receives substantial validation through AIGC feedback mechanisms, particularly those demonstrated by DeepSeek's superior feedback quality score (4.1/5.0). Expert A's detailed example illustrates this alignment: "DeepSeek recognises SOV word order patterns as systematic L1 interference rather than random error, providing targeted explanations and practice exercises." This capability extends beyond simple correction to encompass the negotiation of meaning that Long identifies as central to acquisition, though Expert B identifies a crucial limitation: "while platforms provide feedback, they struggle to engage in meaningful negotiation that characterises effective human interaction."

Vygotsky's sociocultural theory, particularly the concept of the Zone of Proximal Development (ZPD), finds mixed support in current AIGC implementations. Doubao's multimodal capabilities, reflected in its highest personalised learning score (4.4/5.0), demonstrate potential for scaffolded learning that aligns with Vygotskian principles. Expert H observed that "Doubao's ability to provide coordinated visual, auditory, and textual support creates multiple pathways for learner understanding, potentially expanding the ZPD through varied representational modes." However, Expert G identified a fundamental limitation: "The collaborative construction of knowledge through social interaction, central to sociocultural theory, cannot be adequately replicated through current AI systems, regardless of their technical sophistication."

Strategic implementation framework and practical application scenarios

The synthesis of platform capabilities, expert insights, and theoretical understanding enables the development of comprehensive implementation strategies that translate AIGC

potential into sustainable educational practice. This multi-tiered strategic framework addresses both technological possibilities and contextual constraints in resource-limited environments like Kyrgyzstan, directly responding to expert-identified themes of economic constraints (mentioned by 5/8 experts) and teacher preparedness issues (identified by 6/8 experts) while leveraging complementary platform strengths. The strategic framework encompasses four interconnected implementation phases, each designed to build institutional capacity while demonstrating educational value through progressive complexity and sophistication. This phased approach addresses the expert consensus on the need for gradual technology integration while maximising the distinct capabilities of each platform within appropriate pedagogical contexts.

Phase 1 establishes foundational capabilities through low-risk, high-impact applications that capitalise on ChatGPT's accessibility strengths, evidenced by its superior user interface score (4.3/5.0) while requiring minimal infrastructure investment. Expert C's recommendation to "begin with free platform features for basic content generation" exemplifies this approach, allowing institutions to experience AIGC capabilities without financial commitment while building teacher confidence and technical familiarity.

Phase 2 introduces sophisticated multimodal integration through Doubao's advanced capabilities, leveraging its highest personalised learning score (4.4/5.0) to address specific linguistic challenges identified in the cultural adaptation analysis. Expert A's practical scenario demonstrates implementation: "In intermediate phonetics classes, teachers use Doubao to generate animated pitch contours synchronised with audio examples, directly targeting the tonal discrimination difficulties that Kyrgyz speakers face." This phase addresses the technical infrastructure barriers identified by all experts while providing tangible learning improvements.

Phase 3 incorporates DeepSeek's advanced analytical capabilities, utilising its superior language processing (4.6/5.0) and feedback quality (4.1/5.0) scores to address systematic grammatical challenges characteristic of Kyrgyz-Chinese language transfer. Expert E's university-level implementation exemplifies this approach: "In advanced writing classes, teachers use DeepSeek to analyse student compositions and identify patterns of SOV word order transfer from Kyrgyz to Chinese, generating targeted exercises while teachers facilitate peer discussions." This phase directly addresses the personalised learning mechanisms theme identified across all expert interviews.

Phase 4 achieves comprehensive integration by combining multiple platform capabilities within coherent pedagogical frameworks, addressing the implementation strategies theme identified across 7/8 expert interviews. This phase represents the culmination of institutional capacity building, enabling sophisticated coordination of technological capabilities with established pedagogical practices. Cultural adaptation emerges as a critical success factor requiring systematic attention across all implementation phases. The moderate cultural adaptability scores across all platforms (3.1 to 3.6/5.0) necessitate innovative approaches that bridge technological capabilities with local cultural contexts. Expert G's comprehensive strategy provides a practical model: "Teachers use AIGC-generated content about Chinese festivals as starting points, then facilitate discussions connecting these concepts to Kyrgyz cultural equivalents, creating meaningful cultural bridges that enhance both linguistic and cultural competence." The implementation framework synthesises these insights into a structured approach that addresses both technological capabilities and contextual constraints, providing institutions with clear progression pathways while maintaining pedagogical effectiveness (Table 4).

Table 4. Strategic implementation framework for AIGC integration

Implementation phase	Primary focus	Platform applications	Infrastructure requirements	Success indicators
Phase 1: Foundation	Low-risk demonstration	ChatGPT dialogue generation	Basic internet access	Teacher confidence, engagement
Phase 2: Enhancement	Multimodal integration	Doubao pronunciation training	Stable connectivity, audio tools	Improved pronunciation accuracy
Phase 3: Sophistication	Error analysis integration	DeepSeek grammar correction	Advanced hardware, training	Reduced systematic errors
Phase 4: Comprehensive	Integrated platform use	Multi-platform coordination	Full infrastructure, support	Holistic language improvement

Source: compiled by the author

This strategic framework provides institutions with evidence-based implementation pathways that acknowledge both technological potential and practical constraints, ensuring sustainable integration of AIGC technologies within existing educational structures while maximising pedagogical effectiveness for Chinese language instruction in Central Asian contexts.

DISCUSSION

The results of this study demonstrate that AIGC platforms provide measurable improvements in personalised instruction, immediate feedback, and adaptive learning in Kyrgyz educational contexts. These findings resonate with earlier research, while also advancing understanding of platform-specific strengths and limitations. For instance,

the evaluation of real-time corrective feedback mirrors the paper by P. Ramana *et al.* (2024) – study of AI-driven chatbots in English learning, which highlighted enhanced engagement but also revealed difficulties in cultural contextualisation. In the Kyrgyz setting, these limitations were echoed by expert testimonies emphasising the need for teacher mediation in cultural adaptation. Similarly, the superior analytical precision of DeepSeek, especially in identifying L1 interference patterns, corresponds with C. Chen & Y. Gong's (2025) findings that AI-assisted writing tools are particularly effective at recognising systematic learner errors.

The immersive, multimodal affordances observed in Doubao parallel M. Arif *et al.* (2025), who reported that AI-driven tools in Chinese instruction improved phonological accuracy among international students. This convergence suggests that multimodal integration is especially beneficial for complex languages like Chinese, where tonal and script-based features present persistent challenges. At the same time, the results of the present study showed that Doubao's greater cultural adaptability, compared with other platforms, partially addresses the deficiencies noted by J. Xia *et al.* (2024), who found that most AIGC applications neglect cultural fluency. Moreover, the strong performance of ChatGPT in generating contextually appropriate dialogues aligns with E. Bonner *et al.* (2023), who demonstrated that LLMs can provide scalable teaching materials in under-resourced environments. However, while E. Bonner *et al.* emphasised the broad utility of AI content, findings of the present research indicate that ChatGPT's limited capacity for deep cultural personalisation remains a significant barrier in Kyrgyzstan.

The expert interviews confirmed these comparative insights by highlighting the importance of hybrid approaches. As X. Tan *et al.* (2025) observed, teacher preparedness and professional development are indispensable for sustainable AIGC adoption. The data of the present research suggest that AIGC technologies, while highly effective in automating adaptive input and feedback, cannot yet replace human mediation in the sociocultural dimensions of learning. This supports the conclusions of B. Li *et al.* (2025), who argued that learner affective factors, such as anxiety and motivation, require more comprehensive evaluation in AI-assisted contexts. This is further reinforced by the findings of V. Riznyk & N. Riznyk (2024), who proposed a pedagogical system for vocational education that integrates a range of AI tools, highlighting the importance of a structured, methodological approach to AI implementation in education. Taken together, these comparisons reveal that while AIGC platforms offer meaningful pedagogical advantages for Chinese language instruction, their effectiveness depends on strategic integration with human expertise and culturally responsive teaching. By situating the findings of the present research within prior research, it becomes clear that AIGC should be regarded not as a substitute for teachers but as a complementary

tool that enhances language learning when guided by robust pedagogical frameworks.

■ CONCLUSIONS

This study fills a vital gap in international Chinese language education by exploring the integration of AIGC technologies with SLA principles to advance personalised learning for non-native learners, with a specific focus on Kyrgyzstan within the BRI framework. Through comprehensive platform evaluations, interviews with eight expert specialists, and in-depth theoretical analysis, the research delivers empirical evidence and practical frameworks for sustainable AIGC implementation in resource-constrained educational environments. The findings underscore AIGC's significant potential for personalised Chinese language instruction, as evidenced by platform performance scores ranging from 3.8/5.0 to 3.9/5.0 across critical dimensions. Three primary mechanisms stand out: adaptive content generation (supported by all experts), individual progress tracking with tailored learning pathways (endorsed by 75% of experts), and immediate feedback delivery (unanimously highlighted by experts). These mechanisms align closely with SLA theories, reinforcing Krashen's Input Hypothesis through customised "i + 1" content adjustments and Long's Interaction Hypothesis via sophisticated error detection, exemplified by DeepSeek's top language processing score of 4.6/5.0. However, cultural adaptability remains a notable challenge, with scores ranging from 3.1/5.0 to 3.6/5.0, revealing AIGC's limitations in addressing Vygotsky's sociocultural aspects such as collaborative learning, which still demand human pedagogical expertise. From a practical perspective, the study formulates a four-phase strategic implementation framework customised for BRI contexts like Kyrgyzstan, addressing key barriers noted by experts: technical infrastructure limitations (identified by all experts), gaps in teacher preparedness (noted by 75%), and economic constraints (mentioned by 62.5%). This framework evolves from low-risk applications leveraging ChatGPT's user-friendly interface (4.3/5.0 usability score) to full-scale multi-platform integration, incorporating DeepSeek for grammatical analysis and Doubao for multimodal learning support (4.4/5.0 personalised learning score). Furthermore, cultural bridging strategies that link Chinese content to Kyrgyz cultural contexts offer replicable models to enhance cross-cultural learning effectiveness across diverse BRI regions.

The research highlights that AIGC's true transformative potential lies in augmenting, rather than replacing, human instruction through intelligent content creation and adaptive learning pathways. This perspective informs critical implications for teacher training and institutional strategies, emphasising enhancement over substitution in technology adoption. However, the study acknowledges significant shortcomings that must be addressed. A primary limitation is the absence of direct measurement of learner outcomes, which restricts the ability to validate the real-world impact of AIGC on language acquisition.

Additionally, the small sample size of only eight experts limits the generalisability of the findings, potentially overlooking diverse perspectives. Furthermore, persistent cultural adaptation challenges highlight a critical gap, as AIGC struggles to fully incorporate sociocultural dimensions of learning, necessitating ongoing human mediation to bridge cultural contexts effectively. Future research should prioritise longitudinal studies on learner outcomes through controlled implementations of the proposed framework in Kyrgyz institutions, focusing on learner autonomy, cultural competence, and long-term retention. Developing culturally adaptive AI algorithms tailored to Central Asian contexts and fostering collaboration among technology developers, SLA theorists, and regional educators will ensure a balance between innovation and pedagogical as well as cultural relevance. Moreover, addressing these identified deficiencies is crucial, particularly by expanding research scope to include larger and more diverse expert samples and direct learner data. Attention to ethical concerns such as data privacy and algorithmic bias is also essential to guarantee equitable educational applications and mitigate potential risks associated with AIGC deployment.

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CONFLICT OF INTEREST

None.

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AIGC тарабынан башкарылган Кыргызстандагы эл аралык кытай тили билиминин трансформациясы

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Аннотация. Бул изилдөөдө жасалма интеллект тарабынан түзүлгөн контент (AIGC) технологияларын экинчи тилди өздөштүрүү (SLA) принциптери менен интеграциялоо каралып, кытай тилин чет тил катары үйрөнгөндөр үчүн жекелештирилген окутууну жакшыртуу максаты коюлган. Изилдөө “Бир алкак – бир жол” демилгеси алкагында Кыргызстанга багытталган. Иш аралаш методдорго негизделип, үч платформанын (ChatGPT, DeepSeek жана Doubao) комплекстүү баалоосун, билим берүү адистери менен жарым структураланган маектерди жана белгилүү теорияларга (Крашендин киргизүү гипотезасы, Лондун өз ара аракеттенүү гипотезасы) таянган теориялык талдоону камтыды. Платформаларды баалоо алардын мүмкүнчүлүктөрү боюнча айырмачылыктарды көрсөттү, DeepSeek тилди иштетүү боюнча эң жогорку көрсөткүчтөрдү берди. Эксперттик маектер жекелештирилген окутуунун үч негизги механизмдин аныктады: адаптивдүү контент түзүү, жеке прогрессти көзөмөлдөө жана дароо пикир кайтаруу. Бирок маданий адаптация олуттуу чакырык бойдон калууда, анткени ал социалдык-маданий контекстти толук эске алууда чектөөлөрдү ачып берди жана педагогикалык адистердин катышуусун талап кылат. Изилдөөдө техникалык инфраструктуранын жетишсиздиги, мугалимдердин даярдыктагы боштуктары жана экономикалык чектөөлөр сыяктуу негизги тоскоолдуктарды чечүүгө багытталган төрт фазалуу стратегиялык модель иштелип чыкты. Кытай тилинин окуу контентин жергиликтүү контексттер менен байланыштырган маданий көпүрө стратегиялары сунушталып, алар “Бир алкак – бир жол” демилгесинин ар түрдүү аймактары үчүн үлгү боло алат. Изилдөө AIGC технологиялары мугалимдерди алмаштырбай, тескерисинче, алардын ишин толуктай алаарын көрсөттү – интеллектуалдык контент жаратуу жана адаптивдүү окуу жолдору аркылуу. Методологиялык чектөөлөрдү (мисалы, үлгүнүн чакан көлөмү жана түздөн-түз окуучулардын жыйынтыктарынын жоктугу) эске алуу менен, алынган жыйынтыктар эл аралык кытай тили окутуусунда технологияларды туруктуу жана маданий жактан ылайык интеграциялоонун негизин түздү.

Негизги сөздөр: тил үйрөнүү теориялары; AIGC технологиясы; кытай тилин окутуу; билим берүү моделин реформалоо; педагогикадагы технология

Трансформация международного образования по китайскому языку в Кыргызстане под влиянием AIGC

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Аннотация. В данном исследовании рассматривалась интеграция технологий искусственного интеллекта, генерирующего контент (AIGC), с принципами усвоения второго языка (SLA) с целью повышения персонализированного изучения китайского языка для иноязычных учащихся, с акцентом на Кыргызстан в рамках инициативы «Один пояс, один путь». В исследовании применялся смешанный методологический подход, включавший всестороннюю оценку трех платформ (ChatGPT, DeepSeek и Doubao), полуструктурированные интервью с экспертами в области образования, а также теоретический анализ, основанный на признанных теориях, включая гипотезу вводимых данных Крашена и гипотезу взаимодействия Лонга. Оценка платформ показала различия в их возможностях по ключевым параметрам, при этом DeepSeek продемонстрировала наилучшие результаты в области языковой обработки. Интервью с экспертами выявили три основных механизма персонализированного обучения: адаптивное создание контента, индивидуальное отслеживание прогресса и предоставление мгновенной обратной связи. Однако культурная адаптивность стала значительным вызовом, выявив ограничения в учете социокультурных аспектов обучения, требующих участия педагогов. В статье разработана стратегическая четырехфазная модель внедрения, направленная на преодоление ключевых барьеров, включая недостаточность технической инфраструктуры, пробелы в подготовке преподавателей и экономические ограничения. Были предложены стратегии культурного мостостроительства для связывания китайского учебного контента с местными контекстами, что может служить воспроизводимой моделью для различных регионов инициативы «Один пояс, один путь». Исследование показало потенциал AIGC в дополнении, а не замещении человеческого преподавания благодаря интеллектуальному созданию контента и адаптивным траекториям обучения. Несмотря на наличие методологических ограничений, таких как небольшой объем выборки и отсутствие прямых измерений результатов учащихся, полученные выводы заложили основу для устойчивой и культурно-чувствительной интеграции технологий в международное образование по китайскому языку

Ключевые слова: теории изучения языков; технологии AIGC; преподавание китайского языка; реформа образовательных моделей; технологии в педагогике



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The use of artistic journalism in fostering environmental responsibility among students

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Abstract. The aim of this study was to determine how the use of journalistic texts in the educational process influences the development of students' conscious and responsible attitudes towards the natural environment. The research methodology comprised theoretical analysis and a pedagogical experiment combining questionnaires and expert evaluation, involving 120 students and 10 lecturers from Jusup Balasagyn Kyrgyz National University and Osh State University, to assess the impact of journalistic texts on the formation of environmental responsibility. It was found that at the beginning of the study, only 11.7% of students in the experimental group demonstrated an awareness of the importance of environmental preservation influenced by journalistic texts. After the intervention, this figure rose to 51.7%, indicating a significant increase in ecological awareness. It was shown that the influence of literary journalism on students' sense of personal responsibility for the environment in the experimental group rose from 10% to 48.3%, while in the control group it remained at 30%, highlighting the effectiveness of the materials used. Notably, motivation to participate in environmental initiatives in the experimental group increased from 8.3% to 40%, reflecting a growth in intrinsic motivation. After the experiment, 55% of students in the experimental group acknowledged the impact of the texts on their understanding of the interconnection between culture and nature, compared to 18.3% in the control group, indicating the development of a more holistic environmental worldview. It was also found that positive assessments of the journalistic texts' narrative style increased from 21.7% to 68.3% in the experimental group, demonstrating the influence of the emotional and analytical components of such texts on information perception. Changes in environmentally responsible daily habits were observed in 36.7% of students in the experimental group, compared to 11.7% in the control group, highlighting the practical assimilation of the content. The practical significance of the study lies in its potential application by lecturers, methodologists, and curriculum developers to implement journalistic texts as an effective tool for fostering environmental awareness and active civic engagement among students

Keywords: environmental conservation; educational process; attitudes towards nature; natural resources; cultural and ethnic dimension

■ INTRODUCTION

The relevance of this study stems from the need to foster a new form of ecological consciousness based on responsible attitudes towards nature and integrating both rational and emotional-value components. The issue lies in the underutilisation of the educational potential of literary journalism within ecological education, which limits the formation of deep, morally motivated attitudes towards the environment. This necessitates the search for effective pedagogical tools that can shape ecological consciousness not

only through information but also through emotional and value-based engagement. In scholarly discourse, environmental education for students is regarded as a key aspect of nurturing environmentally responsible citizens. M. Al-Azab Ali Ismail & M. Abdellatif (2024) emphasised the significant role of ecological education in cultivating students' social responsibility, showing that sustained engagement with environmental themes in academic settings fosters not only awareness but also adoption of sustainable practices.

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A similar focus on media influence was demonstrated by A. Banjo & M. Obun-Andy (2023), who explored the role of mass media in raising ecological awareness among residents of Ogun State. They found that consistent media coverage of environmental issues, combined with educational outreach, enhances public environmental responsibility. In the Pakistani context, A. Begum *et al.* (2021) highlighted that ecological education, when paired with religious values – particularly Islamic ethics – significantly fosters environmentally friendly behaviour among students. Environmental responsibility, as shown in their research, emerges as an internal moral imperative. Additionally, N. Ayhan & E. Akman (2020) view literary journalism as an emotional catalyst that, through imagery, philosophical reflections, and local environmental narratives, fosters students' conscious and value-driven attitudes towards nature. Its inclusion in the educational process supports the development of ecological awareness, critical thinking, and personal responsibility for the environment. L. Blaique *et al.* (2023) analysed students' awareness of social responsibility as a broader phenomenon encompassing environmental components. The authors stressed the importance of systematically cultivating civic responsibility through the inclusion of environmental topics in educational programmes. C. Chen *et al.* (2025) examined the influence of institutional practices on students' adoption of "green" habits, demonstrating that university sustainability policies, supported by educational engagement, nurture lasting ecological orientations among students. M. Cernicova-Buca *et al.* (2023) focused on everyday student behaviour on campus as an indicator of ecological awareness. Data collected in Romania revealed that awareness does not always translate into action in the absence of motivation or infrastructural support.

International attitudes towards environmental responsibility were explored by E. Hui (2025), who found that pupils in international schools often shift the burden of climate change onto governments and corporations, underscoring the need for pedagogy to emphasise individual accountability. In the context of organisational ecological performance, Q. Huynh (2020) argued that environmental responsibility within institutions is closely linked to overall organisational effectiveness, reinforcing the importance of instilling ecological responsibility during professional training. Further, J. Jaiswal & S. Bihari (2020) showed that a stronger emotional connection to nature corresponds with more responsible consumption behaviour, highlighting the potential of literary journalism to shape emotionally charged value-based attitudes towards nature.

The studies reviewed point to the importance of educational strategies that do more than inform – they transform worldviews through media, literature, value education, and institutional support. However, current research gives insufficient attention to the role of literary journalism in shaping environmental responsibility among students. Existing studies tend to focus on general ecological education, institutional policy, or religious-moral aspects, while the

emotional-value potential of journalistic texts remains underexplored. Moreover, there is a lack of empirical data on the impact of literary journalistic works on youth environmental behaviour. This study therefore aimed to examine the influence of literary journalistic texts on the development of environmental responsibility among students. To achieve this, the following objectives were set: to conduct a theoretical analysis of literary journalistic texts and determine their role in environmental education; to assess their impact on students' ecological awareness and responsibility during the learning process; to develop recommendations for the effective integration of such materials into educational practice to enhance students' motivation and engagement.

■ MATERIALS AND METHODS

The research was based on articles from the newspaper Kyrghyz Tuusu (Green Climate Fund..., 2025; Measures strengthened against..., 2025), as well as pieces from Akipress (About 2,000 Tien Shan..., 2025; During a raid..., 2025), addressing issues such as pasture degradation, water pollution, and deforestation. These journalistic texts were selected for their emotional depth and thematic relevance to pressing environmental challenges in Kyrgyzstan. They blend analysis with cultural values and are capable of fostering a sense of personal responsibility in students.

The pedagogical experiment was conducted directly within the educational process between April and May 2025. The study involved 120 Biology students from two institutions – Jusup Balasagyn Kyrghyz National University and Osh State University. Inclusion criteria were: aged 18-22, enrolled at one of the aforementioned universities, and active participation in the learning process. Exclusion criteria included irregular class attendance or refusal to participate. Students were divided into two groups: an experimental group (60 students) and a control group (60 students), based on their academic performance and interest in environmental topics. The experimental group comprised students with a strong interest in environmental issues and an academic average of no less than 85. The control group consisted of students with lower performance and less expressed interest.

In the experimental group, sessions were conducted within a special course titled Ecological Culture and during extracurricular educational activities, featuring selected journalistic texts by Kyrghyz authors. The control group followed the standard curriculum without emphasis on such materials. Before and after the experiment, both groups completed a questionnaire aimed at determining their level of environmental responsibility, attitudes towards nature, motivation to engage in ecological initiatives, and readiness for environmental actions. The questionnaire was developed specifically for this study, using simple and clear wording to allow participants to accurately reflect their attitudes and changes. A pilot version was tested on a small group (n = 10) to assess clarity, logic, and phrasing. Based on the results, minor editorial adjustments were made to improve response clarity. The reliability of the

questionnaire was ensured through internal consistency of the questions, covering key aspects of ecological awareness: motivation, behavioural readiness, emotional engagement, knowledge, and attitude. Its validity was ensured by alignment with the content of the journalistic texts used in teaching. Statistical analysis of the responses allowed the identification of consistent trends in students' evolving ecological orientations. The study adhered to the Code of Ethics of the American Sociological Association (1997). All data were processed in compliance with principles of anonymity and voluntary participation. The questionnaire included the following eight closed-ended questions:

1. Have the literary-journalistic texts you worked with influenced your understanding of the importance of nature conservation?

- a. significantly improved my understanding;
- b. helped me somewhat to grasp the issue;
- c. had no impact;
- d. difficult to say.

2. Following your exposure to journalistic texts, to what extent has your attitude towards personal responsibility for the environment changed?

- a. I have started to treat the environment more responsibly;
- b. my sense of responsibility has slightly increased;
- c. my attitude has remained unchanged;
- d. I feel it is not my concern.

3. Have journalistic texts inspired you to participate in practical environmental activities (volunteering, clean-up efforts, awareness campaigns)?

- a. yes, I actively took part;
- b. I intend to get involved in the future;
- c. no, I do not plan to;
- d. no, I do not consider it necessary.

4. Which elements of the journalistic texts most influenced your attitude?

- a. themes of moral responsibility towards nature;
- b. descriptions of real environmental problems in the region;
- c. examples of positive behaviour and initiatives;
- d. cultural and ecological traditions of the people;
- e. other (please specify) _____.

5. Did the journalistic texts help you better understand the link between culture and nature in the context of environmental protection?

- a. yes, they helped a lot;
- b. helped to some extent;
- c. no, the connection did not become clearer to me;
- d. I hadn't thought about it.

6. How would you evaluate the writing style of the journalistic texts (a combination of analysis and literary imagery) in terms of its impact on you?

- a. it makes the information more understandable and emotionally meaningful;
- b. it is interesting but does not influence my attitude;
- c. the style does not matter to me;
- d. difficult to evaluate.

7. Do you feel that reading journalistic texts has personally motivated you to change your daily habits in order to protect nature?

- a. yes, I have already started making changes;
- b. I am currently only considering it;
- c. no, it has not affected my habits;
- d. difficult to answer.

8. Do you believe that including such journalistic texts in the curriculum contributes to a better development of students' environmental awareness?

- a. yes, it is very effective;
- b. possibly useful, but not essential;
- c. no, it has little impact;
- d. cannot say.

Quantitative analysis of the collected data involved statistical methods, particularly the calculation of means and comparative analysis using Student's t-test. This allowed for an objective assessment of the effectiveness of literary journalism in shaping environmental awareness. Statistical processing was performed using IBM SPSS Statistics software. A threshold of statistical significance was set at $p < 0.05$.

In addition to the questionnaire, within the framework of the pedagogical experiment, observations were made of student engagement during discussions of the texts, as well as their initiative in organising and participating in environmental activities. The observations and assessments of the learning outcomes were conducted by lecturers from the aforementioned universities, who recorded behavioural, motivational, and engagement changes among students throughout the course of the experiment. Assessments were carried out twice – at the beginning and after the completion of the pedagogical intervention. A standardised observation protocol was used to record the proportion of students demonstrating each of the defined criteria. These included: active participation in group discussions, initiative in environmental activities, ability to reflect on the texts, expression of ecological viewpoints during presentations, regular involvement in extracurricular initiatives, emotional engagement with the topic, creativity in solving environmental cases, and the overall dynamics of attitude change towards nature. The indicators were expressed as percentages reflecting the number of students whose behaviour exhibited the relevant traits. To enhance reliability, a preliminary harmonisation of the interpretation of each criterion was conducted among all observers, including the discussion of manifestation examples and typical situations related to the respective characteristics. This ensured intersubjective consistency, minimised subjective bias, and standardised the lecturers' approaches to recording manifestations of environmental responsibility among students. The group of lecturers comprised ten individuals aged between 42 and 55. Inclusion criteria required at least five years of teaching experience. Those who declined participation were excluded. Ethical standards were upheld throughout the experiment: participation of both students and lecturers was voluntary, and all participants were fully

informed about the purpose and methods of the study, with the option to withdraw at any stage without consequences. The lecturers conducting the experiment were instructed to adhere to ethical norms and appropriate interaction with students, based on the Code of Ethics of the American Sociological Association (1997). Anonymity was preserved, and participants gave informed consent for the processing of personal data during the study. As a result of the research, a clear algorithm for incorporating literary-journalistic texts into the educational process was developed. Based on the data obtained, specific recommendations for lecturers were formulated.

■ RESULTS

Analysis of literary-journalistic texts by Kyrgyz authors as a tool for developing environmental awareness

The newspapers Kyrgyz Tuusu and Akipress predominantly feature an analytical writing style. They address concrete environmental challenges faced by different regions of Kyrgyzstan. Commonly discussed topics include pasture degradation – a critical issue for agrarian communities – water pollution, particularly affecting Lake Issyk-Kul and the Naryn River, deforestation in mountainous areas, and the destruction of natural ecosystems due to unsustainable use of natural resources. Journalists not only reported on these facts but also expressed concern over the lack of effective environmental oversight by authorities and the passivity of local communities. This contributed to shaping the notion of collective responsibility for the environment. For instance, the article in Kyrgyz Tuusu outlines an official cooperation programme between Kyrgyzstan and the Green Climate Fund, approved until 2027 (Green Climate Fund..., 2025). The article details climate adaptation measures and environmental improvements supported by international funding. Emphasising long-term planning, resource mobilisation, and coordinated action, the text conveys to readers

the importance of sustainable development and the shared responsibility of both the state and society in preserving the environment. Another article from Kyrgyz Tuusu, addresses the issue of illegal fishing, which threatens aquatic ecosystems (Measures strengthened against..., 2025). It describes increased law enforcement efforts, including patrols and controls aimed at protecting water resources. This reinforces the significance of legality in the use of natural resources, fostering a sense of accountability for ecosystem preservation. The article published in Akipress, reports on the introduction of a new tree-watering technology in the capital, which reduces water usage and enhances irrigation efficiency in urban areas (During a raid..., 2025). The use of special capsules for slow water release contributes to the conservation of green spaces and combats drought. The article promotes environmental awareness through the example of resource-efficient technologies and urban ecological care. Another article in Akipress covers a set of initiatives aimed at conserving Lake Issyk-Kul, including clean-up operations, pollution control, and the involvement of organisations in protecting this natural asset (About 2,000 Tien Shan..., 2025). Emphasising collective action and shared responsibility among state bodies and communities, the piece cultivates an ecological stance centred on the preservation of unique natural ecosystems.

These journalistic texts contribute not only to raising awareness but also to developing critical thinking. The analysis of literary texts fostered empathy and critical thinking among students – particularly awareness of ecological crises, the search for solutions, and the rethinking of consumer culture. This transformed environmental education from a theoretical subject into an effective tool for shaping civic engagement. Table 1 summarises the environmental topics and issues addressed in texts by Kyrgyz authors, with a focus on their influence on the development of environmental awareness.

Table 1. Examples and issues of ecology in contemporary Kyrgyz journalism

Source/author	Article title	Environmental theme	Issue addressed
Newspaper "Kyrgyz Tuusu"	Green Climate Fund cooperation program approved until 2027	Climate change, international cooperation	Implementation of climate change adaptation programmes, ensuring sustainable development
Newspaper "Kyrgyz Tuusu"	Measures strengthened against illegal fishing	Protection of water resources	Intensified fight against illegal fishing, threat to the preservation of aquatic ecosystems
Newspaper "Akipress"	About 2,000 Tien Shan spruce saplings planted on the Bishkek-Naryn-Torugart highway in Kemin district	Urban greening, water conservation	Introduction of new irrigation technologies to preserve trees in urban conditions
Newspaper "Akipress"	During a raid in the waters of Issyk-Kul, 1,000 metres of fishing nets were seized and destroyed	Protection of lake ecosystems	Active measures to clean and preserve the ecological condition of Lake Issyk-Kul

Source: compiled by the author based on an analysis of articles in Kyrgyz Tuusu (Green Climate Fund..., 2025; Measures strengthened against..., 2025), Akipress (During a raid..., 2025; About 2,000 Tien Shan..., 2025)

In particular, the research findings indicate the high effectiveness of journalistic texts as an educational resource for fostering environmental awareness among young people. These texts combine emotional impact, cultural depth,

and factual specificity, making them a versatile tool both for teaching and for shaping personal attitudes towards nature. It is recommended that the use of such texts be expanded in school and university education, particularly

within environmental education programmes, as this will contribute to the development of sustainable ecological consciousness in future generations.

Assessing the impact of literary journalism on students' environmental responsibility education

Literary journalism can significantly influence the development of environmental responsibility among students by engaging their emotions, imagination, and critical thinking through vivid, figurative portrayals of environmental issues. Unlike purely scientific or statistical information, literary-journalistic texts present environmental matters

in a personalised and emotionally charged form – through narratives, metaphors, and moral appeals – which makes abstract or distant problems more immediate and meaningful for the reader. This approach fosters empathy towards nature, encourages reflection on human-environment relationships, and motivates behavioural change by forming an emotional connection to environmental themes. As a result, students are more likely to internalise ecological values and develop a sense of personal responsibility for environmental preservation. Table 2 presents the data from the initial student survey regarding the influence of journalistic texts on environmental education.

Table 2. Initial questionnaire: Distribution of responses in the control and experimental groups

Questions	Answer options	Control group		Experimental group	
		Percentage (%)	Number of students (n)	Percentage (%)	Number of students (n)
1. Did the artistic and journalistic texts you worked with influence your understanding of the importance of nature conservation?	a) Significantly improved understanding	10	6	11.7	7
	b) Helped to realise the problem a little	20	12	25	15
	c) Had no effect	50	30	48.3	29
	d) Difficult to say	20	12	15	9
2. After reading the journalistic works, how much has your attitude towards personal responsibility for the environment changed?	a) Became more responsible	8.3	5	10	6
	b) My sense of responsibility has increased slightly	21.7	13	28.3	17
	c) Remained unchanged	50	30	45	27
	d) I feel that this is not my concern	20	12	16.7	10
3. Did the journalistic texts inspire you to participate in practical environmental activities (volunteering, cleaning, educational activities)?	a) Yes, I have actively participated	5	3	8.3	5
	b) I intend to participate	15	9	20	12
	c) No, I do not plan to participate at this time	55	33	50	30
	d) No, I don't think it's necessary	25	15	21.7	13
4. Which elements of the journalistic works had the greatest impact on your attitude?	a) Moral responsibility	15	9	18.3	11
	b) Real environmental problems	30	18	31.7	19
	c) Examples of positive behaviour	10	6	11.7	7
	d) Cultural and environmental traditions	10	6	10	6
	e) Other (emotional images, descriptions of my native region, quotes from journalistic works)	35	21	28.3	17
5. Did the journalistic texts help you better understand the connection between culture and nature in the context of environmental protection?	a) Yes, they helped a lot	11.7	7	13.3	8
	b) They helped a little	25	15	28.3	17
	c) No, the connection did not become clearer	45	27	40	24
	d) I did not think about it	18.3	11	18.3	11
6. How would you rate the style of the journalistic works (combination of analytics and artistic images) in terms of their impact on you?	a) The information is clear and emotional	20	12	21.7	13
	b) It is interesting, but it does not influence me	15	9	18.3	11
	c) The style does not matter	50	30	45	27
	d) It is difficult to assess	15	9	15	9
7. Do you feel that reading journalistic works has motivated you personally to change your daily habits for the sake of nature conservation?	a) Yes, I am already making changes	10	6	11.7	7
	b) I am just thinking about it	20	12	25	15
	c) It did not affect my habits	50	30	45	27
	d) Difficult to answer	20	12	18.3	11

Table 2. Continued

Questions	Answer options	Control group		Experimental group	
		Percentage (%)	Number of students (n)	Percentage (%)	Number of students (n)
8. Do you think that including such journalistic texts in educational programmes contributes to the better formation of environmental awareness among students?	a) Yes, very effective	25	15	28.3	17
	b) Useful, but not essential	30	18	31.7	19
	c) Does not have a significant impact	30	18	25	15
	d) I cannot say	15	9	15	9

Source: compiled by the author

In the initial questionnaire, the results of both groups were generally similar; however, the experimental group demonstrated higher environmental sensitivity and motivation for action. For instance, in response to the question about the influence of the texts on understanding the importance of nature conservation, 48.3% of students in the experimental group stated that the texts had no impact – only 1.7% less than in the control group (50%). However, the proportion of those who indicated increased awareness of the problem was higher in the experimental group – 25% compared to 20%. This suggested a slightly deeper engagement with the content. In the question regarding personal responsibility for the state of the environment, the experimental group again showed higher figures: 28.3% compared to 21.7% in the control group (students who reported a strengthened sense of responsibility). A similar trend was observed in the question about willingness to participate in environmental activities, where 20% of the experimental group expressed an intention to get involved in the future, compared to 15% in the control group. Although the difference was modest, it reflected a higher potential for practical environmental engagement in the experimental group.

When identifying which aspects of the texts influenced them, 35% of respondents in the control group chose their own options (emotive imagery of nature, descriptions of their native region, quotations from the texts), while in the experimental group, references to real regional environmental problems predominated (31.7%), indicating a greater focus on specific content and examples. With regard to the impact of journalistic texts on understanding the link between culture and nature, the difference

between the groups was moderate. However, respondents in the experimental group (28.3%) more frequently demonstrated awareness of the cultural context of environmental issues compared to those in the control group (25%). When assessing the writing style (the combination of analytical approach and literary devices), the differences were minimal – 18.3% in the experimental group versus 15% in the control – indicating slightly greater engagement with text analysis. The experimental group also showed a higher willingness to change their daily ecological habits: 25% of respondents said they were considering specific actions, compared to 20% in the control group. This distribution of responses was influenced by differences in teaching methods: the control group followed a traditional programme without a specific focus on environmental journalism, whereas the experimental group engaged in targeted work with eco-themed literary-journalistic texts, integrated into learning tasks, discussions, and reflective exercises. This differentiation in educational approaches most likely contributed to the development of a higher level of environmental awareness in the experimental group.

As shown by the results of the follow-up questionnaire, after undergoing the respective teaching methods in each group, it was students in the experimental group who demonstrated significant positive changes: there was an increase in awareness of the importance of nature conservation, personal responsibility for the environment, inspiration to participate in environmental activities, and positive shifts in daily habits (Table 3). This confirms the effectiveness of integrating literary journalism as a means of environmental education, whereas in the control group, changes were minimal and largely statistically insignificant.

Table 3. Results of students' responses in the final questionnaire

Questions	Answer options	Control group		Experimental group	
		Percentage (%)	Number of students (n)	Percentage (%)	Number of students (n)
1. Did the artistic and journalistic texts you worked with influence your understanding of the importance of nature conservation?	a) Significantly improved understanding	15	9	51.7	31
	b) Helped to realise the problem a little	25	15	40	24
	c) Had no effect	40	24	6.7	4
	d) Difficult to say	20	12	1.7	1

Table 3. Continued

Questions	Answer options	Control group		Experimental group	
		Percentage (%)	Number of students (n)	Percentage (%)	Number of students (n)
2. After reading the journalistic works, how much has your attitude towards personal responsibility for the environment changed?	a) Became more responsible	10	6	48.3	29
	b) My sense of responsibility has increased slightly	30	18	41.7	25
	c) Remained unchanged	45	27	6.7	4
	d) I feel that this is not my concern	15	9	3.3	2
3. Did the journalistic texts inspire you to participate in practical environmental activities (volunteering, cleaning, educational activities)?	a) Yes, I have actively participated	6.7	4	40	24
	b) I intend to participate	18.3	11	38.3	23
	c) No, I do not plan to participate at this time	50	30	15	9
	d) No, I don't think it's necessary	25	15	6.7	4
4. Which elements of the journalistic works had the greatest impact on your attitude?	a) Moral responsibility	18.3	11	30	18
	b) Real environmental problems	35	21	41.7	25
	c) Examples of positive behaviour	11.7	7	18.3	11
	d) Cultural and environmental traditions	8.3	5	6.7	4
	e) Other (emotional images, descriptions of my native region, quotes from journalistic works)	26.7	16	3.3	2
5. Did the journalistic texts help you better understand the connection between culture and nature in the context of environmental protection?	a) Yes, they helped a lot	18.3	11	55	33
	b) They helped a little	28.3	17	35	21
	c) No, the connection did not become clearer	40	24	8.3	5
	d) I did not think about it	13.3	8	1.7	1
6. How would you rate the style of the journalistic works (combination of analytics and artistic images) in terms of their impact on you?	a) The information is clear and emotional	21.7	13	68.3	41
	b) It is interesting, but it does not influence me	18.3	11	21.7	13
	c) The style does not matter	45	27	8.3	5
	d) It is difficult to assess	15	9	1.7	1
7. Do you feel that reading journalistic works has motivated you personally to change your daily habits for the sake of nature conservation?	a) Yes, I am already making changes	11.7	7	36.7	22
	b) I am just thinking about it	25	15	41.7	25
	c) It did not affect my habits	48.3	29	15	9
	d) Difficult to answer	15	9	6.7	4
8. Do you think that including such journalistic texts in educational programmes contributes to the better formation of environmental awareness among students?	a) Yes, very effective	28.3	17	75	45
	b) Useful, but not essential	31.7	19	18.3	11
	c) Does not have a significant impact	25	15	5	3
	d) I cannot say	15	9	1.7	1

Source: compiled by the author

The results of the final questionnaire revealed significant changes in students' perceptions of environmental issues in both groups, though the most notable positive shifts were recorded in the experimental group. In response to the question about the influence of the texts on understanding the importance of nature conservation, 51.7% of students in the experimental group stated that their understanding had significantly improved, whereas in the control group, this figure was only 15%. Only 6.7% of the experimental group indicated that the texts had not influenced their understanding, compared to 40% in the control group.

Regarding attitudes towards personal responsibility for the environment, 48.3% of students in the experimental group reported adopting a more responsible stance – substantially higher than the 10% in the control group. An additional 41.7% of the experimental group experienced an increased sense of responsibility, compared to 30% in the control group, indicating a rise in environmental self-awareness. When asked about inspiration to participate in environmental initiatives, 40% of the experimental group had already become actively involved, whereas only 6.7% of the control group had done so. A further 38.3% of the

experimental group planned to get involved in the future – well above the 18.3% in the control group – indicating a greater willingness for practical environmental engagement. The question concerning the most influential elements of the texts also showed a shift in emphasis: 41.7% of the experimental group highlighted the influence of real environmental issues (compared to 35% in the control group), while 30% mentioned moral responsibility as a motivator – considerably higher than the 18.3% in the control group.

Students in the experimental group clearly acknowledged that journalistic texts helped them better understand the connection between culture and nature: 55% stated that it was very helpful, which is 36.7% higher than the 18.3% recorded in the control group. A similar trend was observed regarding the assessment of the writing style: 68.3% of the experimental group found the information both clear and emotionally engaging, while only 21.7% of the control group shared this view. As for changes in everyday habits, 36.7% of the experimental group had already begun to implement changes – three times higher than the 11.7% in the control group. Additionally, 41.7% of the experimental group reported they were considering specific actions, compared to 25% in the control group.

Concerning the inclusion of journalistic texts in educational programmes, 75% of the experimental group fully supported this idea, whereas support in the control group was significantly lower – only 28.3%. These results clearly indicate the effectiveness of using literary-journalistic texts in fostering ecological awareness and motivation for practical action among students in the experimental group. Thus, under the influence of a specially designed approach involving eco-themed literary-journalistic texts, the experimental group experienced a substantial increase in environmental literacy, self-awareness, motivation for action, and emotional engagement, while changes in the control group remained minimal or moderate.

The evaluation by lecturers is a key component in the comprehensive assessment of the pedagogical experiment's effectiveness. As professionals with expertise and experience, they are well-positioned to objectively assess the quality of teaching materials, instructional methods, and the extent to which students have absorbed environmental knowledge and values. Their expert evaluation, as presented in Table 4, provides insight into the dynamics of change in both groups and serves to confirm or refine the conclusions drawn from student surveys.

Table 4. Results of observation and assessment of the effectiveness of student learning by lectures

Assessment criteria	Control group	Experimental group
Active participation in group discussions	30%	85%
Level of initiative in environmental protection activities	21.7%	75%
Ability to reflect on what has been read	25%	80%
Demonstration of an environmental stance in speeches	18.3%	78.3%
Regular participation in extracurricular initiatives	11.7%	70%
Emotional engagement with the subject matter	35%	90%
Creativity in solving environmental cases	20%	73.3%
Overall dynamics of change in attitude towards nature	Slow	Obvious and persistent

Source: compiled by the author

Lecturers noted significantly higher levels of activity and engagement among students in the experimental group compared to the control group. Specifically, participation in group discussions in the experimental group reached 85%, compared to only 30% in the control group, while the level of initiative in environmental protection activities was 75% versus 21.7%. The capacity for reflection after reading was markedly better in the experimental group – 80% compared to 25% – indicating a deeper understanding of the material. An ecological stance was also evident in 78.3% of speeches by students in the experimental group, whereas only 18.3% of the control group demonstrated this. Regular participation in extracurricular initiatives was 70% in the experimental group versus 11.7% in the control, reflecting greater motivation for active involvement. Emotional engagement with the subject matter was at its highest level – 90% in the experimental group against 35% in the control group – and creativity in solving environmental case studies reached 73.3% versus 20%. Overall, lecturers characterised the shift in attitude towards nature as slow in the control group and clear and

sustained in the experimental group. These results testify to the effectiveness of using artistic-journalistic texts in fostering an active, conscious ecological stance and motivation among students.

Algorithm for integrating artistic-journalistic texts in developing students' environmental awareness: Experience, approaches, recommendations

The study developed a clear algorithm for using artistic-journalistic texts to cultivate environmental awareness in students. The algorithm comprises four sequential stages: selecting relevant texts addressing environmental issues; thematic study with emphasis on local challenges; organising discussions, reflections, and role-plays; and involving students in practical conservation initiatives. This approach ensures not only cognitive but also emotional and value-based comprehension of environmental topics. The first stage involves analysing artistic-journalistic works, including publications in local media that raise moral and ecological themes. The second stage covers working with thematic blocks highlighting regional problems such as

pasture depletion or water pollution. At the third stage, lecturers organise discussions and group projects to develop critical thinking. The final, fourth stage entails students' participation in real conservation actions, fostering a responsible attitude towards the environment through personal involvement. A vital component of the algorithm is systematic assessment of learning outcomes, conducted before and after the course to track changes.

Based on the results, recommendations were formulated for lecturers on the effective use of journalistic materials. It is advised to incorporate such texts into specialised courses, such as "Environmental Culture," and to use them in extracurricular activities to support and deepen ecological knowledge. Employing diverse active learning methods – text analysis, group discussions, creative assignments, and reflections – is key to forming a conscious ecological stance. Moreover, regular monitoring of shifts in student attitudes is essential to adjust teaching strategies and enhance their effectiveness. It is recommended to introduce artistic-journalistic works addressing environmental issues not only within specialised courses but also integrated into interdisciplinary programmes across humanities and natural sciences. This allows environmental problems to be viewed through ethical, philosophical, historical, and cultural lenses, deepening students' understanding of the ecological crisis and fostering more sustainable motivation for nature conservation. It is also important to regularly update the selection of texts, focusing on current regional issues, contemporary trends in environmental journalism, and feedback from students themselves, thereby increasing interest and engagement.

In addition to reading and analysing journalistic materials, it is advisable to organise creative tasks – writing essays, designing environmental posters, filming short videos or podcasts based on the readings. Such activities stimulate critical thinking and emotional processing of the material, while also developing skills to communicate ecological themes to a wider audience. Extracurricular work should include discussions with experts, meetings with local eco-activists, and excursions to conservation sites. This reinforces a personal ecological position and fosters a lasting value-based attitude towards nature as a common good. Thus, the developed algorithm and recommendations provide a holistic approach to fostering environmental awareness, combining cultural-historical context with contemporary ecological challenges. The use of artistic-journalistic works makes learning more emotionally engaging, motivates students to active ecological participation, and promotes a responsible attitude to nature as an integral part of their lives and national identity.

■ DISCUSSION

The study's results demonstrated the significant potential of artistic journalism in shaping environmental responsibility among students. It was found that engaging with journalistic texts on ecological themes notably enhanced students' ability to critically reflect on environmental issues,

increased empathy towards nature, and fostered elements of ecological consciousness. These findings confirmed the importance of literary-journalistic materials in informal environmental education, aligning with the conclusions of S. Singer *et al.* (2023), who emphasised the effectiveness of combining artistic and factual texts in climate change education. Engagement with journalistic texts contributed not only to forming environmental concepts but also to activating personal attitudes towards environmental problems. This trend resonated with the findings of H. Nourmoradi *et al.* (2021), who demonstrated the efficacy of educational programmes in cultivating responsible environmental attitudes in developing countries. Many students exhibited moral reflection on environmental issues during text analysis, indicating deep personal involvement.

A similar pattern was noted by M. Jamaludin *et al.* (2023), who highlighted the importance of emotional components in youth environmental education. Content analysis of student responses revealed that artistic-journalistic texts had a greater impact compared to traditional teaching materials, in agreement with M. Subires-Mancera & J.J. Delgado-Peña (2022), who underscored the power of environmental journalism and documentary filmmaking as tools for informal environmental education. This informational strategy enabled not only knowledge acquisition but also the development of motivational and value-based guidelines for nature protection. The study found that students who regularly engaged with artistic-journalistic materials showed higher readiness for eco-activism. This supported findings by Z. Virant *et al.* (2024), who noted that environmental responsibility correlated directly with awareness and participation in communication practices. Likewise, A. Uzorka *et al.* (2024) emphasised the importance of involving young people in sustainable initiatives through meaningful communication, which fosters a sense of belonging to change processes. Significant positive shifts were observed in the experimental group students, including increased awareness of nature conservation importance, personal environmental responsibility, inspiration to participate in ecological activities, and positive changes in daily habits. Similar trends were described by H. Sah *et al.* (2023), who documented the influence of perceived environmental responsibility on ecological behaviour with positive dynamics. The use of artistic journalism stimulated engagement in environmental discussions within the student community, aligning with N. Khasana *et al.* (2023), who stressed that strategically incorporating moral dilemmas in educational materials aids environmental problem comprehension. Notably, students' behavioural intentions changed, with increased willingness to sort waste, conserve resources, and take part in environmental campaigns after interacting with the texts. Comparable behavioural transformations were reported by K. Karyati (2022), who studied environmental behaviour among students in Pakistan, considering responsibility and value factors. Institutional influence on developing environmental responsibility in universities was also confirmed: faculties with

well-developed ecological communication showed more pronounced positive dynamics. This concurs with E. Korhonen (2023), who established a link between institutional practices and policies and students' ecological behaviour formation. The importance of systematic approaches to ecological culture formation in higher education is further supported by R. Babkovich (2023), who emphasised that ecological culture represents a complex personal characteristic requiring interdisciplinary integration of knowledge from philosophy, ecology, cultural studies, sociology, and psychology for effective development amongst university students. Analysis of discourse practices within the student body showed artistic journalism acted as a "trigger" factor shifting passive knowledge into active stance. These findings echoed Y. Yang (2024), who highlighted the importance of transmitting "green" knowledge for cultivating ecological entrepreneurship. Texts relating to local contexts or familiar realities held special importance in forming environmental responsibility. This matches observations by Q. Wang & G. Li (2024), who stressed localisation strategies in corporate sustainability narratives.

Results also revealed that artistic-journalistic texts effectively engaged even students previously inactive in environmental matters. Similar observations appear in D. Murray *et al.* (2023), who proposed environmental responsibility as a meta-framework for researching conscious actions in sustainable development contexts. The study recorded a correlation between studying artistic journalism and the development of reflective thinking, consistent with M. Kolahi & R. Azimi Segin Sara (2023), who demonstrated the connection between critical thinking and socio-ecological responsibility in higher education. The influence of the texts' value component should be separately noted: materials appealing to ethics, moral beliefs, and responsibility elicited stronger emotional responses. This corresponds with results by E. Mashaba *et al.* (2022) and S. Parry & E. Metzger (2023), who studied the role of social responsibility in students' environmental education. The research also confirmed heightened student interest in visual journalism – environmental essays and illustrated reports. This aligned with A. Mohd Effendi & W. Tun Ismail (2025), who found positive impacts of visual content on student wellbeing and engagement with environmental responsibility topics. The study demonstrated that artistic-journalistic works successfully engaged youth with environmental themes, confirmed by M. Torroba Diaz *et al.* (2023), who emphasised the media's role in shaping environmental consciousness.

An interdisciplinary approach, combining sociology, literary studies, ecology, and journalism, proved important. This approach was supported by V. Yarnykh (2022), noting environmental journalism's ability to transform public consciousness, especially in Global South countries. Analysis showed that students with a strong personal connection to environmental issues exhibited more positive changes in ecological responsibility, matching A. Vartanian (2024), who studied climate change responsibility perceptions

among international school students. Furthermore, discussion of artistic-journalistic texts not only fostered ecological awareness but also social cohesion around sustainable development values, aligning with Y. Wang *et al.* (2023), who highlighted the link between nature connectedness and pro-environmental behaviour.

In conclusion, the study's results demonstrated that artistic journalism can be an effective tool for environmental education by combining informational, emotional, and ethical components. The observed dynamics in views, attitudes, and behavioural intentions confirmed the importance of literary-journalistic practices as resources for cultivating responsible attitudes towards the environment. The findings aligned with previous research while emphasising the need for further development of tools to deepen youth engagement with environmental topics through mass communication, education, and cultural practices.

CONCLUSIONS

Artistic-journalistic works play a vital role in shaping environmental responsibility, as they not only inform but also emotionally engage students, fostering a deeper understanding of ecological issues through imagery, ethical, and cultural reflections. The analysis focused on artistic-journalistic texts that reflected environmental problems and moral values related to humanity's responsibility towards nature. The examined articles illustrated the spiritual crisis of society, environmental degradation, and the loss of traditional respectful attitudes towards nature. This analysis demonstrated that such texts contribute to the formation of ecological consciousness by emphasising the ethical foundations of environmental protection and the importance of preserving cultural and ecological heritage.

The conducted pedagogical experiment confirmed changes in the levels of environmental awareness, responsibility, and motivation among students, particularly in the experimental group who studied using artistic-journalistic texts. A comparison of the initial and final survey results shows that at the start of the study both groups had roughly similar indicators (11.7% of students in the experimental group versus 10% in the control group felt the influence of artistic-journalistic literature on their understanding of the importance of nature conservation). By the end, this figure had risen to 51.7% in the experimental group, whereas it was only 15% in the control group. A similar trend was observed regarding the texts' influence on attitudes towards personal environmental responsibility – 48.3% in the experimental group versus 10% in the control group. In terms of inspiration to participate in environmental activities, 40% of students in the experimental group actively engaged, while the figure for the control group was only 6.7%. Comparable differences were observed across other survey criteria, indicating a significant impact of using artistic-journalistic texts on shaping students' ecological awareness.

Lecturers' assessments corroborate these findings; according to their observations, participation in group discussions reached 85% in the experimental group compared

to 30% in the control group; the level of initiative in environmental protection activities was 75% versus 20%; and reflective capacity was 80% compared to 25%. Emotional involvement with the subject matter was at its highest – 90% in the experimental group, nearly three times that of the control group. The overall dynamic in changing attitudes towards nature was evaluated by lecturers as clear and stable in the experimental group, whereas in the control group it was slow and insignificant. This disparity underscores the importance of integrating artistic journalism into the educational process. It is recommended to engage students in creative assignments such as essay writing, creating eco-posters or video content, as well as organising meetings with experts and excursions to conservation sites

to cultivate a personally meaningful ecological awareness. A promising direction for future research is to study the impact of artistic-journalistic texts on fostering environmental responsibility among different age groups and within remote and blended learning contexts.

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Окуучуларды экологиялык жоопкерчиликке тарбиялоодо көркөм публицистиканы колдонуу

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Аннотация. Бул изилдөөнүн максаты публицистикалык тексттерди окуу процессинде колдонуу окуучулардын жаратылышка болгон аң-сезимдүү жана жоопкерчиликтүү мамилесин калыптандырууга кандай таасирин тийгизерин аныктоо болгон. Изилдөөнүн методологиясына журналисттик тексттердин экологиялык жоопкерчиликти калыптандырууга тийгизген таасирин баалоо максатында Жусуп Баласагын атындагы Кыргыз улуттук университетинин жана ОшМУнун 120 студентинин жана 10 окутуучусунун катышуусунда анкета менен эксперттик баалоону айкалыштырган теориялык талдоо жана педагогикалык эксперимент камтылган. Изилдөөнүн башында эксперименталдык топтун студенттеринин 11,7 %ы гана публицистикалык тексттердин таасири астында айлана-чөйрөнү сактоонун маанилүүлүгүн түшүнөөрү аныкталган. Интервенциядан кийин бул көрсөткүч 51,7 %га чейин өстү, бул экологиялык маалымдуулуктун олуттуу жогорулагандыгын айгинелейт. Студенттердин айлана-чөйрөгө болгон жеке жоопкерчилигин сезүүсүнө адабий публицистиканын таасири эксперименталдык топто 10 %дан 48,3 %ке чейин жогорулаганы, ал эми көзөмөл тобунда 30 %га чейин сакталып калгандыгы көрсөтүлгөн, бул колдонулган материалдардын натыйжалуулугун баса белгилейт. Баса, экологиялык демилгелерге катышууга болгон мотивация эксперименталдык топто 8,3 %дан 40 %га чейин өстү, бул ички мотивациянын өсүшүн чагылдырат. Эксперименттен кийин эксперименталдык топтун студенттеринин 55 %ы тексттердин маданият менен табияттын ортосундагы байланышты түшүнүүсүнө тийгизген таасирин моюнга алышты, ал эми контролдук топтогу 18,3 %га салыштырмалуу экологиялык дүйнө таанымдын бир бүтүндүгү өнүгүп жатканын көрсөттү. Ошондой эле публицистикалык тексттердин баяндоо стилине оң баа берүү эксперименталдык топто 21,7 %дан 68,3 %га чейин өскөндүгү аныкталып, мындай тексттердин эмоционалдык жана аналитикалык компоненттеринин маалыматты кабыл алууга тийгизген таасирин көрсөткөн. Экологиялык жоопкерчиликтүү күнүмдүк адаттардагы өзгөрүүлөр эксперименталдык топтун окуучуларынын 36,7 %да байкалган, ал эми контролдук топтогу 11,7 %, бул мазмундун практикалык сиңимдүүлүгүн баса белгилейт. Изилдөөнүн практикалык мааниси окуучулардын экологиялык аң-сезимин жана жигердүү жарандыкты өнүктүрүүнүн эффективдүү куралы катары журналисттик тексттерди киргизүү үчүн аны мугалимдер, методисттер жана окуу планын иштеп чыгуучулар тарабынан потенциалдуу колдонууда.

Негизги сөздөр: айлана-чөйрөнү коргоо; билим берүү процесси; жаратылышка мамиле; жаратылыш ресурстары; маданий-этникалык аспект

Использование художественной журналистики в воспитании экологической ответственности у учащихся

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Аннотация. Целью данного исследования было определить, как использование журналистских текстов в образовательном процессе влияет на формирование у студентов сознательного и ответственного отношения к природной среде. Методология исследования включала теоретический анализ и педагогический эксперимент, сочетающий анкетирование и экспертную оценку, с участием 120 студентов и 10 преподавателей Кыргызского национального университета имени Жусупа Баласагына и Ошского государственного университета, с целью оценки влияния журналистских текстов на формирование экологической ответственности. Было установлено, что в начале исследования только 11,7 % студентов экспериментальной группы продемонстрировали осознание важности сохранения окружающей среды под влиянием журналистских текстов. После вмешательства этот показатель вырос до 51,7 %, что свидетельствует о значительном повышении экологической сознательности. Было показано, что влияние литературной журналистики на чувство личной ответственности студентов за окружающую среду в экспериментальной группе выросло с 10 % до 48,3 %, в то время как в контрольной группе оно осталось на уровне 30 %, что подчеркивает эффективность использованных материалов. Примечательно, что мотивация к участию в экологических инициативах в экспериментальной группе выросла с 8,3 % до 40 %, что отражает рост внутренней мотивации. После эксперимента 55 % студентов экспериментальной группы признали влияние текстов на их понимание взаимосвязи между культурой и природой, по сравнению с 18,3 % в контрольной группе, что указывает на развитие более целостного экологического мировоззрения. Также было обнаружено, что положительные оценки стиля повествования журналистских текстов выросли с 21,7 % до 68,3 % в экспериментальной группе, что демонстрирует влияние эмоциональной и аналитической составляющих таких текстов на восприятие информации. Изменения в экологически ответственных повседневных привычках были отмечены у 36,7 % студентов экспериментальной группы по сравнению с 11,7 % в контрольной группе, что подчеркивает практическую усвояемость содержания. Практическая значимость исследования заключается в его потенциальном применении преподавателями, методистами и разработчиками учебных программ для внедрения журналистских текстов в качестве эффективного инструмента формирования экологического сознания и активной гражданской позиции у студентов.

Ключевые слова: охрана окружающей среды; образовательный процесс; отношение к природе; природные ресурсы; культурный и этнический аспект

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