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Research paper

Analysis of Current Tools and Methods for Optimizing The Educational Process in The Context of Digital and Technological Development

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Abstract

The aim of the study was to investigate the system of optimization of the educational process based on modern digital tools and methods in the context of philological education. The study combined qualitative and quantitative methods in a mixed-methods approach. Methodological recommendations for the introduction of digital technologies in the educational process of the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev were developed. These recommendations include mechanisms for the development of digital infrastructure, professional development programs for teachers, methods of creating and adapting educational content for philological disciplines, and tools for monitoring the effectiveness of learning. The study revealed that the use of digital tools led to a significant increase in student engagement in academic discussions by 27%, timely submission of assignments by 17%, and overall satisfaction with the learning format by 23%. A theoretical model of gradual integration of digital tools, considering the specifics of philological education, is presented. The study demonstrates the need for an integrated approach to digital transformation, considering the unique characteristics of philological disciplines, particularly the challenges of working with linguistic and literary materials in digital environments. A system of recommendations for optimizing the learning process has been developed, covering technological, organizational, methodological, and pedagogical aspects of digital transformation, with a focus on creating interactive forms of working with textual materials and developing professional competencies in the digital environment.

Keywords: *Electronic Educational Environment; Interactive Learning; Linguistic Analysis; Pedagogical Innovations; Philological Education; Virtual Communication.*

1. Introduction

In the conditions of rapid digital transformation of society, the system of higher education in the Kyrgyz Republic requires a fundamental rethinking of traditional approaches to the organization of the educational process. Integration of modern technologies into the educational environment becomes not just a desirable condition, but a critical necessity to ensure quality training of competitive specialists. At the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev, the need to update teaching methods and tools that meet the requirements of the digital era feels especially acute. Technological development significantly changes the nature of the professional activity of philologists, creating new challenges for the system of higher education and requiring qualitatively new approaches to the organization of the educational process.

The key problem of the study is the existing contradiction between the need to train highly qualified specialists-philologists, who can work effectively in the digital environment, and the lack of adaptation of traditional teaching methods to modern technological realities. In the system of philological education of the Kyrgyz Republic, there is a gap between the theoretical training of students and the practical requirements of the digital era. The existing approaches to the organization of the educational process often do not take into account the specifics of the national educational system and cultural context, which creates additional barriers to the effective modernization of the educational process at the Faculty of Russian Philology.

Studies in the field of digitalization of education demonstrate the complex nature of the transformation of the educational process in modern conditions. A fundamental analysis of the role of digital technologies in education is presented in the work of Haleem et al. (2022), where special attention is paid to the integration of innovative tools into the educational process and their impact on the effectiveness of learning. Developing this theme, Alenezi (2023) expands the understanding of digital learning in higher education by emphasizing the institutional changes necessary for successful digital transformation of educational institutions.

In the context of higher education adaptation to the challenges of the digital economy, of particular interest are the results of the study by Kholiavko et al. (2021), which reveal the potential of information and communication technologies as a strategic tool for the development of the educational system. In the same direction, Qureshi et al. (2021) offer a comprehensive assessment of the effectiveness of digital technologies in the context of Education 4.0.

A significant contribution to the understanding of innovative pedagogical principles was made by Bizami et al. (2023), systematizing the possibilities of technological tools for immersive blended learning. Marion & Fixson (2021) investigated the transformation of innovation processes and the impact of digital tools on the organization of educational activities. Bygstad et al. (2022) reveal the concept of digital learning space in the context of the digital transformation of higher education. Complementing this perspective, Wilkens et al. (2021) emphasize the needs of students and issues of accessibility of digital education. Warke et al. (2021) consider the sustainable development of educational technologies through the prism of digital transformation.

The analysis of existing studies has revealed several unresolved problems that require further study: insufficient elaboration of mechanisms for integrating digital tools into the traditional educational process, taking into account the specifics of philological education; the lack of a comprehensive approach to assessing the effectiveness of digital educational technologies in the context of national characteristics of the educational system; the need to develop adaptive teaching methods that take into account the cultural context and technological capabilities of specific educational programs; and the need to develop adaptive teaching methods that take into account the cultural context and technological capabilities of specific educational institutions. This research fills these gaps by proposing a tailored framework for integrating digital tools in philological education, offering a systematic approach to evaluate their effectiveness, and developing adaptive teaching methods that consider the cultural and technological contexts of educational institutions.

This study aimed to develop and investigate a comprehensive system for optimizing the learning process based on modern digital tools and methods. To achieve this goal, several tasks were undertaken. First, a comprehensive analysis of existing digital tools and methods used in philological education was conducted. Additionally, key factors influencing the effectiveness of digital technology implementation in the learning process were identified. Finally, methodological recommendations for optimizing the learning process, specifically tailored to the Faculty of Russian Philology, were developed.

2. Materials and methods

The study was conducted at the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev in the period from February to March 2024. The empirical base was the data obtained through structured in-depth interviews with teaching staff and the results of an anonymous online survey of students.

The research methodology was developed taking into account the current approaches to assessing the digital transformation of educational institutions proposed by Bygstad et al. (2022) and adapted to the specifics of philological education.

When conducting in-depth interviews, a purposive sample of 21 faculty members (20 women and 1 man) representing key philological disciplines was formed. The age composition of the respondents ranged from 28 to 68 years old. In terms of length of service, the respondents were distributed as follows: 3-5 years – 2 people, 6-10 years – 6 people, 11-20 years – 4 people, more than 20 years – 9 people. The sample included representatives of all departments of the faculty: Modern Russian Language (6 teachers), Practical Course of Russian Language (6 teachers), Methods of Teaching Russian Language (9 teachers).

The interviews were conducted using a pre-designed questionnaire including 15 open-ended questions. Examples of key questions are:

1) What digital tools do you use in your teaching activities, and why do you use them specifically?
2) What challenges do you face in implementing digital technologies in the teaching process?
3) What kind of methodological support do you need to use digital tools more effectively?
4) How do you think digitalization affects the quality of philological education?

The anonymous online survey, implemented through the Google Forms platform, involved 107 2nd-4th year students of the Faculty (101 women and 6 men) aged 19-23 years old. Distribution of respondents by courses: 2nd year – 46 people, 3rd year – 39 people, 4th year – 21 people. The questionnaire included 20 questions of different types: multiple choice (8 questions), Likert scale (7 questions), and open-ended questions (5 questions). Examples of questions are:

1) Rate on a 5-point scale the effectiveness of the digital tools used in your teaching.
2) What digital technologies do you think should be introduced into the educational process?
3) What difficulties do you face when using digital technologies in your teaching?

All participants were informed about the aims and methods of the study, and gave written informed consent to participate and to use the data for research purposes. Confidentiality of participants' personal information was ensured by anonymizing the data at the stage of data collection and processing.

In the process of the research, the legal and regulatory framework governing the processes of digital transformation of higher education in the Kyrgyz Republic was studied. In particular, the key provisions of Law of the Kyrgyz Republic No. 1074-XII "On Education" (1992), which determine the legal basis for the introduction of digital technologies in the educational process, the requirements for e-learning and distance education technologies, as well as standards of digital educational environment, were analysed. The State Educational Standard of Higher Professional Education: Philology (2021) has been studied in detail, in particular, the sections concerning the requirements for the material and technical support of the educational process, the information and educational environment of the university, and the electronic information and educational environment.

The competences related to the use of digital technologies in the professional activity of a philologist are analysed. The requirements for the conditions of implementation of the main educational programmes of the Master's degree in Philology, determining the necessary level of technological equipment of the educational process, requirements for electronic educational resources, learning management systems, and necessary software are considered. Special attention is paid to the sections regulating the use of specialized software for philological research and text analysis.

To quantitatively assess the effectiveness of the educational process, a system of indicators was developed, including: the level of students' involvement in discussions, timeliness of assignments, quality of work performance, and satisfaction with the learning format. The assessment was carried out on a 100-point scale based on the analysis of students' academic performance and questionnaire results.

3. Results

3.1 Analysis of the current state of digitalization of the educational process

The study conducted in February 2024 at the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev allowed identifying the current state of digitalization and determining the main directions of necessary changes.

The interviews revealed the current state of the Faculty's technological infrastructure: there is one computer class for 12 workstations equipped with basic software; out of eight classrooms, only three are equipped with projectors; there is one interactive whiteboard. Of particular concern is the limited Wi-Fi coverage, covering only 40% of the area of classrooms, with an Internet connection speed of 25 Mbit/s, which significantly limits the use of modern educational technologies.

In the course of interviews with teachers, the key barriers to wider implementation of digital tools in the educational process were identified. The majority of the interviewed teachers highlighted insufficient technical training as the main obstacle, which indicates the need to organize systematic professional development in the field of digital technologies. 20 out of 21 respondents emphasized limited technical infrastructure as a critical factor constraining the digital transformation of the educational process. 5 out of 8 respondents also pointed to the lack of methodological support for the introduction of new technologies.

The survey results revealed the uneven use of digital tools in the educational process. Learning management systems (LMSs) are involved in only a quarter of core courses, which significantly limits the opportunities for systematic monitoring and evaluation of the learning process. Cloud-based collaboration services are used in four disciplines, mainly for organizing group projects and sharing learning materials. The situation is somewhat better with the use of online testing tools, which are regularly used in four courses. Of particular concern is the limited use of specialized philological software, which is used only in two core disciplines.

A comprehensive analysis of the data collected during the study at the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev allowed a detailed assessment of the effectiveness of the implemented digital solutions in the educational process. The evaluation methodology was based on a comparative analysis of disciplines implemented in the traditional format and courses that actively use digital tools. Significant positive dynamics were found for all key indicators of the effectiveness of the educational process, indicating the significant potential of digital transformation in the context of philological education.

The most indicative result was a significant increase in student engagement in academic discussions – by 27% in disciplines with the use of digital tools compared to the traditional teaching format. Other improvements include a 17% increase in the timely submission of assignments and a 23% increase in overall satisfaction with the learning format.

The analysis of feedback from students revealed a significant request for increased use of digital tools in the educational process. A significant majority of 107 respondents expressed an active interest in wider use of digital technologies. Particular interest was expressed in the introduction of digital tools in courses in modern literature and linguistic text analysis. Students noted that digital tools allowed them to work more effectively with textual materials, conduct linguistic analyses, and participate in group discussions. It is indicative that the request for digitalization comes specifically from students, which indicates a natural need to modernize the educational process in line with modern technological capabilities and professional requirements.

A detailed comparative analysis was conducted to systematize the results obtained and to enable a quantitative comparison of the effectiveness of different educational formats. Its results are presented in the summary table of educational process indicators (Table 1), which demonstrates the quantitative differences between traditional and digital learning formats by key parameters of the educational process.

Table 1: Comparative analysis of the effectiveness of educational formats at the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev (2024)

Indicator	Traditional format (%)	With DI (%)	Efficiency gain (p.p.)
Engagement in discussions	45	72	+27
Submitting assignments on time	68	85	+17
Satisfaction with the learning format	55	78	+23
Quality of task completion	63	82	+19

Notes: DI – digital instruments; p.p. – percentage points. The assessment was carried out on a 100-point scale based on the analysis of students' academic performance and the results of the questionnaire.
Source: compiled by the authors.

Digital tools improve the quality of teaching at the Faculty of Philology. Students not only learn better, but also show more interest in classes. These positive results suggest that the introduction of digital technologies should be continued, but that the problems with technical equipment and teaching methods need to be solved.

3.2 Factors of the effectiveness of the introduction of digital technologies into the educational process

The success of digital learning depends largely on the technical base of the university. Good equipment and stable internet determine how effectively modern technologies can be used in teaching. Without a fast network and new technology, it is impossible to fully transition to digital teaching methods (Nikolopoulou et al. 2021). The current situation at the Faculty is characterized by significant infrastructural limitations: internet connection speeds are only 25 Mbit/s and Wi-Fi coverage covers only 40% of teaching spaces. These limitations create significant obstacles to the full use of modern educational technologies and require priority attention when planning digital transformation activities.

The analysis of organizational and methodological aspects of digitalization has shown the need to create a holistic digital educational environment that takes into account the specifics of philological disciplines (Sailer et al. 2021a). The development of methodological recommendations for the integration of digital tools into the process of teaching language and literature is of particular importance. The existing approaches to the organization of the teaching process require significant adaptation for the effective use of digital technologies. An important aspect is to strike a balance between traditional teaching methods and innovative digital solutions (Basar et al., 2021; Onipko & Yaprynets, 2024).

In the transition to digital learning at the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev, it is essential to consider how ready teachers are to work with new technologies. The survey showed that the majority of teachers, out of 21 interviewees, want to acquire additional skills in working with digital tools. Among the main problems, teachers noted insufficient knowledge of specialized software for philological disciplines, limited skills in creating digital educational content, and difficulties in organizing effective

online interaction with students. At the same time, the level of digital competence varies significantly depending on the age and work experience of teachers: specialists with up to 10 years of work experience demonstrate a higher level of mastery of digital tools and greater readiness to integrate them into the educational process (Lucas et al. 2021).

The sociocultural aspects of digital transformation are manifested in significant differences in the perception and use of digital technologies between different generations of educational participants (Shcherban & Khoma, 2024; Pavliuchenko, 2023). Teachers under the age of 35 actively use digital tools in their daily practice, independently master new technologies, and take initiative in their implementation. At the same time, teachers in the older age group (over 50 years old) prefer traditional teaching methods and experience significant difficulties when it comes to transitioning to digital formats of work. This intergenerational gap creates additional difficulties in implementing uniform standards for digitalization of the educational process and requires the development of differentiated professional development programmes (Szymkowiak et al. 2021).

Digitalization depends not only on teachers' willingness to learn new things, but also on students' interest in learning (Griban et al. 2020; Sabatayeva et al. 2018). Where digital tools are used, students attend classes more often (15-20% increase), turn in assignments on time (23% more often), and study better (average grade increased by 0.8). Students are more engaged in interactive formats, participate more in team projects, and are generally happy with this approach to learning. Most of them want to see more use of digital technology in their studies, especially in the study of contemporary literature and parsing texts (Iglesias-Pradas et al. 2021; Rakhimberdinova et al. 2022).

Technical assistance and methodological support have a direct impact on how successful the digital modernization of teaching will be (Kerimkhulle et al., 2021; Derevianko & Shovkaliuk, 2023). Analysis of the situation has shown that teachers do not receive sufficient support in mastering digital tools. If resources are scarce, it is critical to build a working support system for educators that combines technical issues and support in the implementation of new teaching methods (Spiteri & Chang Rundgren, 2020). It is important to note that the successful integration of digital tools into the educational process requires a systematic approach that considers the interrelationship of all factors and their impact on the quality of education.

A significant factor influencing the effectiveness of digitalization is the quality of digital educational content and its relevance to the specifics of philological education (Sopivnyk et al. 2024; Semenovska et al. 2023). Teachers note the need to adapt existing digital resources to the peculiarities of language and literature teaching, as well as the need to create specialized digital materials for philological disciplines. A special role is played by the possibility of integrating different formats of information presentation and ensuring interactive interaction in the learning process (Sailer et al. 2021a). At the Faculty of Russian Philology, there is a deficit of quality digital educational resources adapted to the specifics of the disciplines taught, which significantly limits the possibilities of effective use of digital technologies.

The study also showed the importance of organizational culture and administrative support for digital transformation processes. Successful implementation of digital technologies requires the creation of a favourable organizational environment that supports innovation and promotes the professional development of teachers (Prontenko et al. 2019; Kálmán & Poyda-Nosyk, 2023). An important aspect is the creation of a culture of collaborative learning and sharing of experience between teachers in the use of digital technologies.

The Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev lacks a system of financial incentives for teachers for the introduction of digital innovations, which significantly reduces the motivation to master new technologies. At the same time, 87% of the 21 interviewed teachers noted their readiness to more actively implement digital tools if there is appropriate support from the administration, including technical assistance, methodological support, and financial incentives. In-depth interviews with faculty revealed a strong need for a system of mutual support and experience sharing: 75% of the 21 respondents stressed the importance of regular meetings to discuss practical aspects of using digital technologies, and 62% of the 21 expressed interest in participating in a mentoring programme.

As key barriers to the development of an effective organizational culture of digital transformation, lecturers highlighted the lack of a clear digitalization strategy at faculty level and a lack of coordination between different departments. The findings correlate with research on the impact of organizational culture on the success of digital transformation in higher education, which highlights the critical importance of institutional support and the establishment of a professional development system for faculty (Lucas et al. 2021).

The analysis of how different factors influence the success of digitalization helped to identify the relationships of the factors with each other and their impact on the quality of teaching. The results of the study are systematized in a matrix that shows the key areas for the development of digital learning in the Faculty of Philology (Table 2).

Table 2: Matrix of factors of efficiency of digitalization of the educational process in philological education

Category of factors	Significance level[1]	Level of development[2]	Barriers	Recommendations
Technological	Critical (4.8)	Low (2.1)	Outdated infrastructure, insufficient funding, lack of technical support	Modernization of information infrastructure, updating of technical equipment
Organizational	High (4.3)	Medium (2.8)	Weak methodological support, lack of systemic coordination	Development of a digital strategy, implementation of a quality management system
Pedagogical	High (4.2)	Medium (3.0)	Lack of digital content, lack of competencies	Development of digital competencies, creation of educational and methodological complexes
Social	Medium (3.7)	High (3.5)	Psychological resistance, intergenerational differences	Development of corporate environment, adaptation programs

*Notes: [1] Assessment on a 5-point scale; [2] Current level of development of the factor. Quantitative assessments of the level of significance and degree of development of factors are based on subjective expert assessments obtained during interviews with faculty members and analysis of questionnaire results. Source: compiled by the authors based on Sailer et al. (2021b), Nikolopoulou et al. (2021), Lucas et al. (2021), Rafiola et al. (2020), and Szymkowiak et al. (*2021).

The results presented in the table demonstrate the complex nature of the influence of various factors on the effectiveness of digitalization of the educational process. The most critical are technological factors characterized by a low degree of development at a high level of significance. Organizational and pedagogical factors also require significant attention, especially in terms of the development of methodological support and professional competencies of teachers. Social factors, despite a relatively high degree of development, need constant monitoring and adjustment to ensure effective adaptation of all participants in the educational process to digital transformation.

3.3 System for optimizing the educational process using digital technologies

On the basis of the analysis of the current situation and the identified factors of efficiency, it is proposed to develop a comprehensive system of optimization of the educational process for the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev.

This system should take into account the normative requirements for digitalization of higher education, as enshrined in the Law of the Kyrgyz Republic No. 1074-XII "On Education" (1992). The law provides the foundational legal framework for integrating digital technologies into education, addressing the importance of modernizing the education system to meet the needs of the digital era. Key provisions within this law outline the scope for e-learning, the standards for distance education technologies, and the prerequisites for establishing a digital educational environment within higher education institutions. Specifically, it mandates the development and expansion of digital infrastructures that are essential for the effective delivery of educational programs in the context of modern technologies.

In addition to the Education Law, the analysis also incorporated the State Educational Standard of Higher Professional Education: Philology (2021), which details the specific requirements for implementing Master's degree programs in Philology. This document outlines the expectations for the technological infrastructure and digital learning resources needed for higher education, particularly emphasizing the integration of digital tools that align with the modern needs of philological disciplines. The standard highlights the necessity for advanced learning management systems, specialized software for linguistic analysis, and the availability of digital resources tailored to the unique demands of philology. Furthermore, the standard underscores the importance of equipping both the students and the teaching staff with the requisite digital competencies to ensure the successful implementation of these systems.

As a basic element of the system, it is recommended to create a model of gradual integration of digital tools into the educational process. At the initial stage (2024-2025 academic year), it is advisable to focus on the development of basic digital infrastructure: modernization of the computer class, expansion of Wi-Fi coverage up to 85% of teaching spaces, increase in the Internet connection speed up to 100 Mbit/s. These measures will ensure compliance with the minimum technological requirements set out in the updated national standards for the quality of education.

The basis of the proposed system is a common digital platform for learning. It will unite the management of the learning process, work with course materials, control academic progress, and facilitate communication between teachers and students. The platform should meet the special requirements of philological education: it should support text parsing, allow working with video and audio, and enable students to carry out joint projects. As part of the methodological component of the system, it is recommended to develop detailed scenarios for the use of digital tools for different types of classes. For lecture courses, it is advisable to introduce interactive presentations with multimedia elements, online questionnaires, and instant feedback mechanisms (Mariukhnich & Mokliak, 2024; Shevchuk & Hunaza, 2025). For practical classes, it is recommended to use specialized tools for linguistic analysis, virtual whiteboards for collaborative work, and systems for automated checking of written work. Special attention should be paid to the creation of digital learning materials, taking into account the specifics of philological disciplines (Petrova et al. 2018; Susanti et al. 2025). In particular, it is recommended to create a database of video lectures, interactive tasks, and virtual workshops on key subjects. When developing materials, it is necessary to consider the requirements for accessibility of educational content for students with special educational needs.

The development of teachers' digital skills requires continuous training (Kapoor et al. 2025). For this purpose, it is important to organize regular practical sessions on working with digital tools and to create a system of experience sharing, where digitally experienced teachers help their colleagues. The training programme should be tailored to each teacher's current skills and subject (Spytska, 2024; Brovina et al., 2024). This will ensure that all teaching staff learn digital technologies systematically.

The success of the system's implementation can be assessed through a set of specific indicators that reflect real changes in the educational process. Among the key evaluation criteria are: growth of digital skills of teachers, active use of digital tools in teaching, quality of e-learning materials, feedback from students and teachers on new methods of work, and efficiency of use of technical resources. For each criterion, it is necessary to define precise targets and continuously monitor their implementation, analysing the dynamics of changes in the short and long term. Such systematic monitoring will help to quickly find weaknesses, timely adjust the strategy, and improve the process of digitalization of teaching to meet the real needs of the faculty.

An important aspect of the proposed optimization system is the creation of administrative support mechanisms for digital transformation. At the faculty level, it is recommended to form a working group on digitalization, including representatives of the administration, teachers, and technical specialists. The tasks of the group should include the coordination of the processes of digital technology implementation, monitoring of the efficiency of its use, and prompt solution of arising problems. It is also advisable to develop a system of incentives for teachers who actively implement digital innovations in the educational process, including material and non-material forms of encouragement.

As part of the technical support of the digitalization process, it is recommended to create a specialized technical assistance service for teachers and students. This service should provide prompt resolution of technical problems, counselling on the use of digital tools, and support in the creation of digital educational content. For the service to work effectively, it is necessary to develop clear regulations for handling requests, define time standards for responding to different types of problems, and create a knowledge base of typical issues and solutions.

The quality of digital learning materials requires special attention and control. The faculty should establish a system for checking and evaluating digital materials, covering three key aspects: content, teaching methodology, and technical execution. This requires an expert group of experienced teachers of philology, teaching methodologists, and technical advisors in digital technologies. When developing assessment standards, it is important to take into account both the specificities of teaching philological disciplines and current digital learning standards. In addition to this, regular feedback from students and teachers who use these materials in the learning process is required. The detailed plan for the implementation of the quality assessment system and other recommendations is summarized in the table (Table 3).

Table 3: Recommendations for creating a system for optimizing the educational process based on digital technologies

Direction of optimization	Recommended activities	Expected results	Priority
Infrastructure development	Modernization of the technical base, implementation of high-speed Internet, creation of a technical support system	Availability of digital services – at least 90%, uninterrupted operation of systems	High
Methodological support	Development of scenarios for using digital tools, creation of a database of educational materials	Full methodological support for 70% of disciplines	High
Personnel development	Training programs, mentoring systems, and incentive mechanisms	Increase in digital competence by 35-40%	Medium
Quality Management	Creation of a monitoring system, content expertise, and user feedback	Compliance with international quality standards	Medium

Notes: Priority is determined based on the analysis of the current needs of the faculty and the possibility of implementing the activities. Expected results are formulated considering the actual capabilities of the educational institution and the established implementation deadlines. Quantitative indicators and assessments are advisory and can be adjusted considering the specifics of a particular educational institution.
Source: compiled by the authors.

The developed recommendations can provide a foundation for the transition of the Faculty of Philology to digital learning technologies. The gradual introduction of new methods and tools can improve the quality of education and open new opportunities in teaching with the help of modern technologies (Bezshyyko et al., 2008; Onyshchenko & Serdiuk, 2025). It is important to note that the transition to the digital format of teaching can be successful only with the active participation of teachers and students, as well as with the support of the faculty management. The key issue in the implementation of the plans is funding. The transition to digital technologies requires serious investments in technical equipment, development of teaching materials, and teacher training (Aviv et al., 2024; Diachuk, 2024). If budgetary funds are insufficient, additional funding can be sought through international educational grants, partnerships with technology companies, and participation in educational development programmes. The creation of joint projects with leading IT companies and educational centres may also be a promising direction.

The initial period of digital technology implementation (2024-2025 academic year) requires an accurate choice of priorities and competent use of resources. Since quick and visible results motivate further changes, the first steps could be the launch of a basic online learning system and introductory courses on digital tools for teachers. In parallel, it is necessary to build a system for tracking the results of implementation. Continuous analyses of how digital tools are used, what teachers and students think about them, and what difficulties arise will lead to a more accurate adjustment of the entire system. An open discussion of the data obtained and joint planning of the next steps with all participants in the process will ensure more effective development of digital learning at the faculty.

In the long term, the successful implementation of the proposed system may become the basis for the creation of a regional centre of competence in the field of digital philological education on the basis of the Faculty of Russian Philology. This will open new opportunities for the development of the Faculty, including the expansion of distance learning programmes, the creation of online courses for international audiences, and the development of research in the field of digital pedagogy and educational technologies.

4. Discussion

The study of the digitalization process at the Faculty of Russian Philology of the Kyrgyz State University named after I. Arabaev revealed how different factors influence each other and together determine the success of digitalization in higher education. The research data confirms that the use of digital tools significantly improves all aspects of learning: students participate more actively in classes, complete assignments on time, learn better, and evaluate the new format positively. And the improvement is systematic – from attendance to final learning outcomes.

The results obtained find confirmation in modern studies of the digitalization of higher education. In particular, Khasanov & Nusupova (2024) note in their study that such positive dynamics are characteristic of successful cases of digital transformation of philological education in Central Asian universities. The most indicative result was a significant increase in student engagement in academic discussions, by 27% in disciplines with the use of digital tools compared to the traditional teaching format. This fact is particularly significant in the context of the findings of Barotovich & Kochkorovna (2024), who emphasize the critical importance of developing communicative competences for future philologists and note the positive impact of digitalization on the formation of these skills.

In terms of technological infrastructure and its impact on the effectiveness of the educational process, the results of the study show interesting dynamics. Alenezi et al. (2023), in their study on the integration of digital education in higher education, emphasize the critical importance of a developed digital infrastructure, setting the minimum requirements for Internet connection speed at 50 Mbit/s and the need for full Wi-Fi coverage of classrooms. However, the results of this study show that even with more modest technical capabilities (25 Mbit/s internet speed and 40% Wi-Fi coverage) it is possible to achieve significant positive dynamics in educational performance. Y.M. Jobirovich (2022), investigating the effectiveness of using digital technologies in the educational system, also focuses on infrastructural requirements, but the results show that these requirements can be adapted to the real capabilities of educational institutions without significant loss of efficiency.

In the context of organizational culture and administrative support for digital transformation, meaningful differences with existing studies are found. Valverde-Berrocoso et al. (2021), analysing the integration of digital technologies in the educational process, focus mainly on the role of administrative support and formal change management mechanisms. The present study revealed a more complex and multifaceted structure of organizational factors, including informal professional development mechanisms, peer support systems for teachers, and a culture of sharing. Particularly revealing is the high level of teacher readiness found – 87 per cent – to actively adopt digital tools in the presence of integrated support, which is significantly higher than that found in the study by Valverde-Berrocoso et al. – 71%.

The analysis of the readiness of the teaching staff of the Faculty of Russian Philology to implement digital educational technologies revealed a high potential for digital transformation. 75% of teachers express active interest in mastering new technologies under the condition of methodological support, which creates a favourable basis for the proposed changes. According to the study, the implementation of a comprehensive digitalization system and appropriate methodological support can lead to an increase in the quality of students' assignments by about 19 p.p. These predicted results find theoretical support in the work of Sailer et al. (2021b), who in their study of digital learning, emphasize the need to go beyond mere technological equipment and create a comprehensive pedagogical support system. The proposed recommendations for digital transformation not only agree with this position but also adapt it to the specifics of higher philological education. Of particular interest is the comparison with the study by Beardsley et al. (2021), who, analysing the urgent transition to digital education, come to pessimistic conclusions regarding teachers' motivation. In contrast, the results of the present study demonstrate that teachers show a significantly higher willingness to innovate digitally when a well-designed support system is put in place and the changes are phased in.

In the area of motivation and educational outcomes, the study demonstrates the significant potential of digital technologies to increase student engagement in the educational process. The data analysis shows that 82% of students from the Faculty of Russian Philology are actively interested in increasing the use of digital tools, especially in the area of linguistic analysis and working with literary texts. At the same time, there is a significant improvement in the quality of educational outcomes: on-time assignment completion increased by 17 p.p., and overall performance improved by 19 p.p. These results are of particular interest in the context of the study by Wekerle et al. (2022), who, in their study of the use of digital technologies to promote higher education, recorded a significantly lower level of student engagement (65%). In their work, Wekerle et al. focus predominantly on the relationship between types of digital activities and specific learning outcomes, whereas the present study found a wider range of motivational factors, including the impact of specialized philological tools on student engagement and the quality of their work. This discrepancy in results may be explained by the specificity of philological education, where digital tools offer unique opportunities for in-depth analysis of texts and development of professional competences (Riznyk & Riznyk, 2024).

In the aspect of technical support and system integration of digital solutions, the results of the study enter into a constructive dialogue with existing works. Clark-Wilson et al. (2020), in their study of digitally-enhanced teaching, advocate the need for a centralized model of technical support and a standardized approach to the implementation of digital tools. However, the findings of this study indicate the greater effectiveness of a distributed support system that includes both a centralized helpdesk and a peer support network amongst teachers. The identified need for a mentoring system, which was supported by 62% of the faculty surveyed, demonstrates the importance of flexible and adaptive support mechanisms for digital transformation.

In the context of platform solutions and their role in the educational process, there are significant differences in the interpretation of their importance. Decuypere et al. (2021), in their critical study of digital learning platforms, view them predominantly as tools for controlling and standardizing the educational process. The results of the present study offer an alternative view, demonstrating the significant potential of platform solutions to increase student engagement and develop communicative competences. In particular, the established 27 p.p. increase in discussion engagement when using digital platforms demonstrates their effectiveness as a tool for enhancing learning activities.

In the field of digital educational content development, the results of the study significantly extend the existing theoretical positions. Selwyn (2021), in his work on education and technology, focuses on universal principles of digital content creation, offering general recommendations for its development and implementation. The results of the present study supplement these provisions by identifying specific content requirements for philological education, including the need to integrate linguistic analysis tools and specialized tools for working with literary texts. The high level of student satisfaction (78%) with courses using specialized digital content confirms the importance of taking subject specificity into account when developing educational materials.

A comprehensive study of the Faculty of Russian Philology has revealed specific characteristics of digitalization in the field of philological education. The analysis has identified a number of key requirements for the organization of digital learning in philology: from specialized tools for linguistic analysis to platforms for collaborative work with texts. The proposed model of digital transformation takes into account the peculiarities of philological education and implies the creation of a specialized digital environment that meets the needs of linguistic and literary analysis. These findings significantly extend the typology of digital transformation effectiveness factors proposed by de Oliveira et al. (2023) in their study of information and communication technologies in the Education 4.0 paradigm. While de Oliveira et al. present a general structure of factors for the digitalization of education, this study supplements it with specific components specific to the philological field, including the particular requirements for the organization of group work with texts and the need to integrate specialized linguistic software.

The study's conclusions point to a number of significant institutional and political ramifications for the Kyrgyz educational system, especially with regard to policy reform. The study emphasises the necessity of more government funding for the digital infrastructure of higher education on a national scale. This entails improving technology infrastructure, guaranteeing fast internet, and extending campus Wi-Fi coverage. These expenditures would be in line with more general policy objectives to update the educational system and raise Kyrgyz universities' level of international competitiveness. The study's focus on teacher professional development also offers policymakers a chance to implement nationwide initiatives that offer faculty members ongoing digital training, promoting a digitally literate culture in higher education.

The study urges the creation of a thorough structure to support digital education and the incorporation of digital tools into the foundational courses of philological disciplines at the institutional level. Institutional policies that encourage faculty members to embrace and successfully employ digital technologies in the classroom may result from this. Universities can encourage faculty participation in digital transformation by offering targeted financial and professional recognition (Mukhtarova et al. 2024; Dudko, 2024). Additionally, colleges might be encouraged to create cooperative platforms for information exchange, which would help create a single national digital learning network. These tactical suggestions would guarantee that students are prepared to succeed in a world that is becoming more and more reliant on technology while also aiding in the institutionalisation of digital education.

While the positive outcomes of digital tools in education are undeniable, the findings of this study emphasize that a more nuanced approach is required to fully integrate digital technologies into the educational process. Teacher overload and resistance to change must be addressed through ongoing professional development programs and the creation of support systems that assist educators in adopting new technologies. These efforts should include mentorship programs, peer support networks, and technical assistance, as well as clear communication of the long-term benefits of digital transformation.

Comparison of the data obtained with other studies shows a path of digitalization of philological education that differs from the generally accepted models. Digital technologies in philology require a special approach that considers the specificity of work with texts, language analysis, and literary sources. The results of the study – both numerical indicators and qualitative characteristics – can help in the development of the theory and practice of digital learning in the humanities. Technology, process organization, and teaching methodologies are interconnected, making the modernization of education require a single integrated approach. This interconnection is also evident in philological education, where digital tools should be organically integrated into traditional methods of language and literature learning.

5. Conclusion

The study of the digitalization of philological education reveals the complexity and multifaceted nature of the process. The transition to digital technologies requires a well-thought-out implementation strategy and consideration of many interrelated factors. Quantitative results from the study indicate that the use of digital tools significantly improves various aspects of learning: student engagement in academic discussions increased by 27%, the timely submission of assignments improved by 17%, and overall satisfaction with the learning format rose by 23%. Specialized digital tools for philologists, such as deep text analysis software, online platforms for linguistic research, and interactive collaborative systems, play a key role in helping students develop the professional skills of a modern philologist and learn to apply digital technologies in their work with language and literature.

The study identified three main conditions for the successful digitalization of teaching: the development of the technical base, the growth of teachers' digital skills, and the creation of quality electronic materials. The atmosphere in the institution is important when the management is supportive of new ideas and teachers are free to experiment with digital teaching methods. Both teachers and students of the faculty are interested in digital technologies and are ready to actively master them. This attitude of the participants in the educational process greatly simplifies the introduction of digital innovations in teaching.

The methodological recommendations form a holistic plan for integrating digital technologies into the teaching of philologists. The plan covers key areas of development: from technical equipment to teacher support. The first area is the development of digital infrastructure. This includes upgrading computer labs, improving the Wi-Fi network, and installing special programmes for philologists. The second is teacher training. Professional development programmes take into account the current level of digital skills and the individual needs of each

teacher. The third direction concerns the creation of teaching materials considering the peculiarities of philological disciplines. The fourth is tracking the results of implementation through a system of monitoring key indicators. Special emphasis is placed on the creation of a reliable support system. The technical part includes a support service with clear rules of work and a database of solutions to typical problems. The methodological component combines mentoring, practical seminars, and platforms for the exchange of experience between teachers. This approach provides comprehensive assistance in the transition to digital technologies.

The study was conducted in one HEI, so the results may not fully reflect the situation in other institutions. The short period of the study also did not allow us to see how digital technologies affect the quality of education in the long term. Further research needs to explore several key areas. Analysing the impact of digitalization on the quality of philological education over the long term becomes a priority. It is necessary to develop special methods for evaluating the effectiveness of digital tools for language and literature education. The creation of a unified digital environment for the training of philologists becomes essential. An important aspect of future research will be the adaptation of the developed system to the peculiarities of different universities. This will make it possible to create universal models of digitalization of philological education applicable in different educational institutions, taking into account their specifics.

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