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THE INFLUENCE OF EDUCATIONAL TECHNOLOGIES ON SCHOOL–UNIVERSITY INTERACTION

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Abstract. The rapid development of digital technologies has renewed the content and governance of education and created new opportunities for cooperation between schools and higher education institutions (HEIs). The topic is relevant due to the need to improve learning outcomes, strengthen teachers' professional interaction, and support students' academic and social adaptation during the transition from school to university. In the post-pandemic period, with the spread of blended and distance learning, the effective use of digital tools has become especially important. This article aims to analyze current trends in the use of digital technologies in school–HEI partnerships, systematize effective practices and challenges, and identify technological solutions and best practices that enhance collaboration. The study uses theoretical analysis of scholarly literature, case study analysis, comparative review, and synthesis of practical experience with digital platforms. The findings highlight key tools that support partnership: cloud-based platforms, virtual communication tools, learning management systems (LMS), interactive media, and shared digital resources. These technologies accelerate information exchange, expand access to educational materials, and improve the management of joint projects, curriculum alignment, and the development of professional communities. The practical value of the study lies in applied recommendations for administrators, teachers, and methodologists on organizing partnerships in a digital environment: structuring

communication, implementing joint educational-methodological and research projects, and supporting students' learning trajectories. The paper also addresses data privacy, the digital divide, and teachers' digital competence, outlining institutional and methodological directions to mitigate these challenges.

Keywords: Digital technologies, collaboration, schools, universities, educational research, technology in education

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БІЛІМ БЕРУ ТЕХНОЛОГИЯЛАРЫНЫҢ МЕКТЕП ПЕН УНИВЕРСИТЕТТІҢ ӨЗАРА ӘРЕКЕТТЕСУІНЕ ӘСЕРІ

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Аннотация. Цифрлық технологиялардың қарқынды дамуы білім беру жүйесінің мазмұны мен басқару тетіктерін түбегейлі жаңартып, мектептер мен жоғары оқу орындары (ЖОО) арасындағы ынтымақтастықты кеңейтетін жаңа мүмкіндіктерді қалыптастырды. Тақырыптың өзектілігі қазіргі білім беру кеңістігінде оқу нәтижелерін жақсарту, педагогтердің кәсіби өзара әрекетін күшейту, сондай-ақ оқушылардың мектептен ЖОО-ға өтудегі академиялық және әлеуметтік бейімделуін жеңілдету қажеттілігімен анықталады. Бұл үдерістер, әсіресе пандемиядан кейінгі аралас және қашықтан оқыту тәжірибесінің кеңеюімен, цифрлық құралдарды тиімді қолдануды талап етеді. Мақаланың мақсаты – мектеп–ЖОО серіктестігі аясында цифрлық технологияларды қолданудың қазіргі тенденцияларын талдау, тиімді кейстер мен мәселелерді жүйелеу және ынтымақтастықты күшейтетін технологиялық шешімдер мен оңтайлы тәжірибелерді айқындау. Зерттеу әдістері ретінде ғылыми әдебиеттерге теориялық талдау, кейстік талдау, салыстырмалы шолу және цифрлық платформаларды қолдану тәжірибесін жинақтау қолданылды. Нәтижесінде ынтымақтастықты нығайтатын негізгі цифрлық құралдар анықталды: бұлтқа негізделген платформалар, виртуалды байланыс құралдары, оқытуды басқару жүйелері (LMS), интерактивті медиа және ортақ цифрлық ресурстар. Аталған технологиялар ақпарат алмасуды жеделдетіп, білім беру ресурстарына қолжетімділікті кеңейтіп, бірлескен жобаларды басқаруды,

оқу бағдарламаларын үйлестіруді және кәсіби қауымдастық құруды тиімді етеді. Зерттеудің практикалық маңызы – мектептер мен ЖОО басшыларына, оқытушыларға және әдіскерлерге цифрлық ортада серіктестік механизмдерін ұйымдастыру, коммуникацияны жүйелеу, бірлескен оқу-әдістемелік және ғылыми жобаларды іске асыру, сондай-ақ оқушылардың оқу траекториясын қолдау бойынша қолданбалы ұсыныстар ұсынуында. Қосымша түрде деректер құпиялылығы, цифрлық теңсіздік және педагогтердің цифрлық құзыретін арттыру мәселелері ескеріліп, оларды шешудің институционалдық және әдістемелік бағыттары көрсетілді.

Түйін сөздер: цифрлық технологиялар, ынтымақтастық, мектеп, университет, білім беру саласындағы зерттеулер, білім берудегі технологиялар

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ВЛИЯНИЕ ОБРАЗОВАТЕЛЬНЫХ ТЕХНОЛОГИЙ НА ВЗАИМОДЕЙСТВИЕ ШКОЛЫ И УНИВЕРСИТЕТА

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Аннотация. Цифровые технологии, развивающиеся высокими темпами, коренным образом обновили содержание и механизмы управления системой образования и сформировали новые возможности, расширяющие сотрудничество между школами и высшими учебными заведениями (вузами). Актуальность темы определяется необходимостью повышения результатов обучения в современном образовательном пространстве, усиления профессионального взаимодействия педагогов, а также облегчения академической и социальной адаптации учащихся при переходе из школы в вуз. Эти процессы, особенно в условиях расширения практик смешанного и дистанционного обучения в постпандемийный период, требуют эффективного использования цифровых инструментов. Цель статьи — проанализировать современные тенденции применения цифровых технологий в рамках партнерства «школа–вуз», систематизировать эффективные кейсы и проблемы, а также определить технологические решения и оптимальные практики, укрепляющие сотрудничество. В качестве методов исследования использованы теоретический анализ научной литературы, кейс-анализ,

сравнительный обзор и обобщение опыта применения цифровых платформ. В результате были выявлены ключевые цифровые инструменты, усиливающие взаимодействие: облачные платформы, средства виртуальной коммуникации, системы управления обучением (LMS), интерактивные медиа и общие цифровые ресурсы. Указанные технологии ускоряют обмен информацией, расширяют доступ к образовательным ресурсам и повышают эффективность управления совместными проектами, согласования учебных программ и формирования профессионального сообщества. Практическая значимость исследования заключается в предоставлении руководителям школ и вузов, преподавателям и методистам прикладных рекомендаций по организации механизмов партнерства в цифровой среде, систематизации коммуникации, реализации совместных учебно-методических и научных проектов, а также сопровождению образовательной траектории учащихся. Дополнительно учтены вопросы конфиденциальности данных, цифрового неравенства и повышения цифровой компетентности педагогов, а также обозначены институциональные и методические направления их решения.

Ключевые слова: цифровые технологии, сотрудничество, школы, университеты, исследования в области образования, технологии в образовании

Introduction. The theoretical underpinnings of school-university collaboration include community of practice theory, constructivism learning theories, and systems thinking. These frameworks emphasize collaborative learning and shared knowledge construction, highlighting how digital technologies can enhance these processes by facilitating communication, data navigation, and information sharing. The relationship between students and universities in our time is the relationship between the consumer and the provider of educational services. Moreover, one of the features of university clients is ignorance of what exactly they want to receive for services. It is in the interests of educational institutions to help the applicant make the right choice and at the same time find new students. Therefore, universities want and strive to actively partner with schools. In general, the digitalization of the education system is very relevant to train modern, competitive specialists.

Many researchers like Darling-Hammond (Darling-Hammond, 2017); Smith (Smith, 2016); attempted to define effective strategy to enhance teachers' professional development between University-school collaboration.

Spivakova E. (Spivakova, 2013), showed three types of work between schools and universities:

1. Educational and methodical, which contains:

– activities to update and adapt the content of specialized education in accordance with the characteristics of the chosen educational orientation;

– preparation and testing of textbooks, educational and didactic manuals for students and teachers working in interacting secondary educational institutions;

– management of educational activities in specialized disciplines;

– personal professional contacts of teachers of secondary educational institutions with university teachers for the exchange of experience.

Scientific and methodological.

Characterized by: the work of electives and clubs at the bases of universities and schools; joint holding of subject Olympiads, seminars and competitions by schools and universities; development of educational programs and training technologies that ensure the continuity of school and university education; implementation of expert assessment and provision of methodological assistance by university teachers in the development of curricula for schools in specialized disciplines;

Personnel, which contains: retraining of personnel, which includes improving the level of teacher training and adapting university teachers to the specifics of working in a schools; referral of university specialists to schools to ensure the educational process and participation in educational and methodological work.

Foreign studies show that it is difficult for teachers to implement innovative teaching methods. At the same time, the data of M. Alderman (Alderman, 2018) showed that joint research aimed at creating new pedagogical knowledge and practices leads to more productive innovation. Building on community of practice theory and systems thinking, school–university collaboration can be conceptualized as a research–practice partnership (RPP). Farrell, Penuel, Coburn, Daniel, & Steup (Farrell et al., 2021) update the definition of RPPs as long-term collaborations aimed at educational improvement or equitable transformation through engagement with research. They emphasize that such partnerships are intentionally organized to connect diverse forms of expertise and to shift power relations so that all partners have a voice in the joint work, with "long-term" often implying an open-ended commitment that allows collaboration to evolve across years. As T. Ley, J. Leoste, K. Tammets (Ley al., 2020) point out, joint creativity, implemented in scientific partnership between schools and universities, helps to educate teachers to take responsibility for studying new teaching methods and their implementation into practice. Recent empirical work further supports the claim that joint research and co-design strengthen innovation and professional learning. Miedijensky & Sasson (Miedijensky & Sasson, 2024) describe an RPP embedded in a professional development program for educators working with youth at risk and propose an evaluation model that links awareness, deep understanding, and practical application of an educational philosophy. Their analysis combines a survey of 140 educators with in-depth interviews with 22 educational staff members, highlighting both implementation strengths/weaknesses and the reciprocal value of RPPs for researchers and practitioners.

At the same time, effectiveness depends on aligning stakeholders' expectations about what teacher development should include. Sapkota (Sapkota, 2025), studying university–school collaboration within a decentralized policy implementation in Norway, collected data through four focus group interviews with 19 lower-secondary teachers and 14 individual interviews with 7 principals and 7 university-based teacher educators. The findings show both shared and distinct conceptions: all groups emphasized teachers' knowledge of policy/reform, content, and curriculum, while teachers prioritized hands-on instructional skills and school/university leaders emphasized reflection and continuous learning across a teaching career.

The interaction between schools and universities in the scientific field helps school

teachers to conduct their own research and summarize their teaching experience. K. McLaughlin, K. Black-Hawkins (McLaughlin, Black-Hawkins, 2006) show that teachers, by participating in pedagogical research, begin to better understand their practice and ways to improve practical activities. A. Crump and S. Khan (Cramp, Khan, 2019) notes that teachers can make a great contribution to the creation of new pedagogical knowledge by working together with academic researchers.

The result of cooperation between school teachers and university teachers is not only the introduction of innovations in the educational process and the generalization of the experience of school education, but also the changes taking place with teachers: the growth of their professional competence and personal transformations. R. Dann (Dunn, 2021) notes that participation in practical research is evaluated by teachers as the best way to improve their qualifications, develops professional knowledge, skills highlighting and solving problems leads to improved learning, as well as to a sense of professional self-realization of teachers

Collaboration between schools and universities is crucial for advancing educational quality and meeting the diverse needs of learners. Schools benefit from access to higher education resources and research, while universities gain insights into the practical challenges faced by institutions. This reciprocal relationship has increasingly been supported and transformed by digital technologies, which offer new avenues for communication, data collection, and analysis. Collaboration between schools and universities has traditionally been limited by geographic, logistical, and administrative barriers. However, the advent of digital technologies has revolutionized the way educational institutions interact, share resources, and engage with students. Digital tools such as learning management systems (LMS), video conferencing platforms, and online collaboration tools have opened up new avenues for partnerships, enabling institutions to work together more closely and effectively than ever before.

The integration of digital technologies into education began with the adoption of basic tools like email and online libraries. Over time, these technologies have evolved into sophisticated platforms that support a wide range of educational activities. Learning management systems, for example, allow for the seamless sharing of resources, assignment submission, and feedback between schools and universities. Video conferencing tools enable real-time collaboration across different locations, while online forums and social media provide platforms for ongoing communication and community building.

Morina et al. (Morina et al., 2025) synthesize evidence from 102 quantitative studies and report that online professional development has medium effects on teacher outcomes *(Hedges' g = 0.71)* and classroom-practice outcomes *(g = 0.55)*, and a small effect on student outcomes *(g = 0.19)*. They also identify moderators: collective participation increases effects at the classroom level, and asynchronous formats are associated with smaller student-level effects compared to synchronous formats.

Digital environments also enable sustained multi-stakeholder collaboration

through online professional learning communities. Liu (Liu, 2025) shows—based on six months of workshop observations and interviews—that professional learning in an online PLC can evolve from a top-down implementation model to shared leadership and teacher-driven adaptation, supported by flexible power structures and adaptive leadership across teachers, policymakers, and academics.

This approach will dramatically improve the quality of education. Oates & Bignell (Oates & Bignell, 2022). show how digital Technologies are transforming collaboration between schools and university.

1. Online Communication Platforms. Digital communication tools such as video conferencing software (e.g., Zoom, Microsoft Teams) and collaborative platforms (e.g., Slack, Google Workspace) have become essential in facilitating collaboration. These platforms allow for real-time discussions, professional development sessions, and collaborative project work, making it easier for educators and researchers to work together, regardless of geographic barriers.

2. Data Collection and Analysis Tools. Digital data collection methods, including surveys, online questionnaires, and learning analytics, enable researchers to gather quantitative and qualitative data efficiently. Tools such as Qualtrics and Google Forms are widely used for administering surveysıo These tools enhance the robustness of research findings by enabling large-scale data collection and intricate data analysis.

3. Learning Management Systems (LMS). LMS platforms (e.g., Moodle, Canvas) support collaborative research by providing environments where schools and universities can share resources, course content, and research findings. These systems allow for the integration of academic and instructional materials, resources, and research outputs, facilitating access to collaborative projects and their outcomes.

4. Virtual Research Communities. Digital technologies have given rise to virtual research communities where scholars, educators, and practitioners can engage with one another. Online forums, social media groups, and collaborative networks such as ResearchGate foster interdisciplinary dialogue and knowledge sharing, breaking down silos that often exist between schools and higher education institutions.

5. Open Educational Resources (OER). The advent of OER has facilitated the sharing of teaching materials and research outputs between schools and universities. Platforms like OER Commons and MERLOT allow educators to create, use, and adapt resources that enhance collaboration and promote innovative teaching practices across educational contexts.

The main task of digitalization in the field of education is to improve the quality of education, that is, to prepare young people of the country who are competitive in various fields, including in the field of "artificial intelligence" and "large – scale data". Kazakhstan's journey toward digital education began with the government's strategic initiatives to modernize the education system. The State Program for the Development of Education and Science in Kazakhstan 2020-2025 highlights the importance of incorporating digital technologies to improve educational outcomes. This program aims to bridge the gap between urban and rural schools, ensuring that students from all backgrounds have access to quality education. Kazakhstan has

invested heavily in digital infrastructure to support the integration of technology in education. The widespread availability of high-speed internet, even in remote areas, has enabled schools to adopt digital tools effectively. Interactive whiteboards, tablets, and laptops are now commonplace in many classrooms, allowing for a more engaging and interactive learning experience.

Below is a chart displayed by the global search engine. According to the diagram from Google Books Ngram Viewer, 1900-1990s: - The graph remains essentially flat, indicating that the phrase "digital technologies in education" was either not used or used extremely rarely in published books during this period. Gradual Increase in 1990s-2000-starting in the late 1990s, there is a slight uptick in the graph. This suggests the beginning of recognition and discussion of digital technologies in the context of education in published literature. Steep Rise 2000s-Present: From the early 2000s onwards, there is a sharp and continuous increase in the usage of the phrase. This indicates a growing emphasis on digital technologies in education, likely due to the rapid advancement and adoption of digital tools and the internet in educational settings. Current Peak 2022: The graph peaks around 2022, reflecting the culmination of decades of increasing interest and discourse surrounding digital technologies in education. This may also be influenced by the global shift towards online and remote learning, particularly during and after the COVID-19 pandemic. Evidence from Kazakhstan also indicates strong demand for school–university scientific and methodological support that can be scaled through digital tools. Begaliyeva, Shmakova, & Zhunisbayeva (Begaliyeva, S. et al. 2025) report a survey of more than 600 teachers in the southern region of Kazakhstan, showing that over 80% require scientific and methodological support for preparing school research projects. Based on this demand, the authors propose developing a pilot digital platform to enable collaborative work among schoolteachers, students, university professors, and gifted students, using the Digital Humanities field as an applied context.

Overall, the diagram shows a clear trend of growing interest and integration of digital technologies in education over the past few decades, particularly accelerating from the 2000s onward (Figure 1).

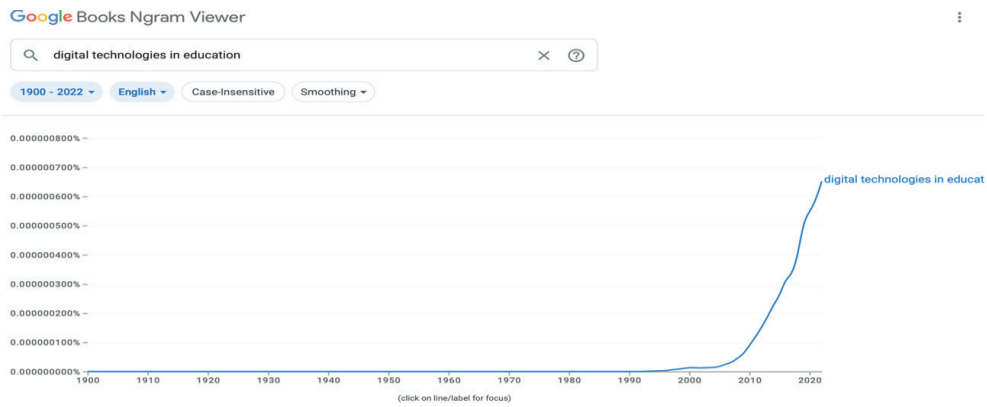

Figure 1. History of using digital technologies in education

The integration of digital technologies in education has transformed how teaching and learning occur, making education more accessible, engaging, and personalized. As technology continues to evolve, its role in education will likely expand, offering new possibilities for enhancing learning experiences.

Today, conceptually, the education system is being implemented in three main areas: digitalization of the educational process, digital educational content, digitalization of Educational Management. However, the pandemic has made its own adjustments in this direction. The creation of digital educational content was carried out quickly. The global pandemic COVID-19 accelerated the implementation of the direction of digitalization of educational content (Есенова et al., 2024).

Based on the results of a 2023 study by international research organizations, the level of use of digital technologies in the field of education is as follows (Figure2).

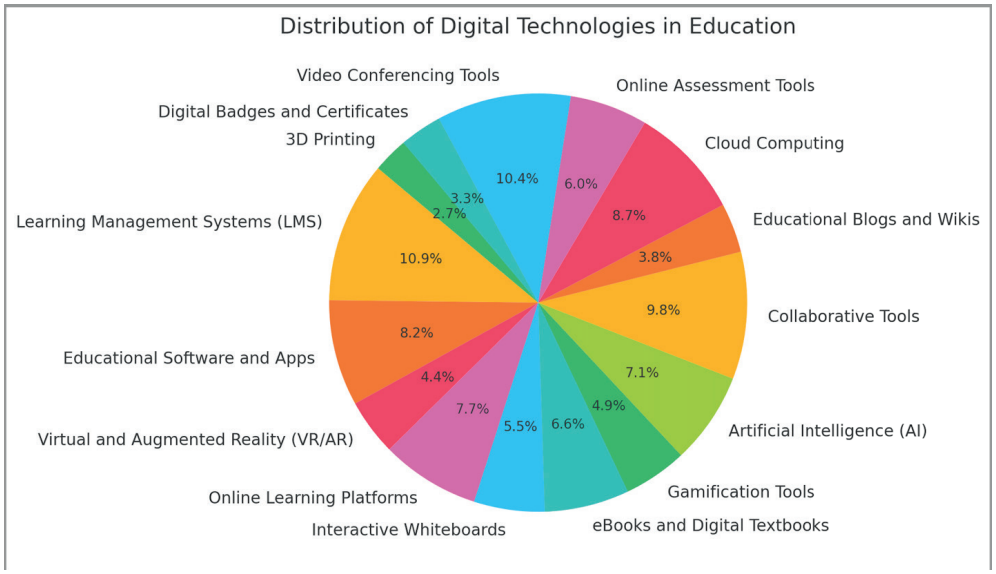

Figure 2. Distribution of Digital Technologies in Education

Here's a pie chart that illustrates the distribution of different digital technologies in education. Each slice represents a different type of technology and its relative usage or importance in the educational field. This visualization helps to see which technologies are more prevalent or have a higher impact in educational environments.

With the introduction of digital technologies into the educational process, new terms like "digital classrooms" have emerged. A digital classroom offers various features designed to enrich the learning experience, including educational applications and websites. Key components of a digital classroom are feedback loops and technology. Feedback loops enable students to receive immediate feedback from their teachers, who can tailor their responses based on individual students, specific lessons, or groups. Additionally, tools like PowerPoint presentations, video presentations, e-learning methods, and online training are increasingly used in

the teaching-learning process, making classroom instruction more interactive and engaging (Table 1).

Table 1. Digital Technology in Education

Digital Technology in Education				
Component: Digital Devices 1.Subcomponents 2-Laptops 3-Tablets 4-Chromebooks 5-Smartphones	Platforms and Tools 1-Social Media 2-Multimedia 3-Educationaol Applications 4-Websites 5-E-learning Methods.	Benefits of Digital Technology 1-Faster Learning 2-Enhanced Engagement 3-Access to a Wide Range of Resources 4-Interactive Learning Platforms	Feedback Mechanisms 1-Real-time Feedback 2-Teachers' Role in Providing Feedback 3-Use of Feedback Loops	Evolution of Education 1-From Traditional Methods to Digital Classrooms 2-Increased Interactivity 3-Opportunities for Self-directed Learning

In Kazakhstan, online learning can be implemented in two forms, such as synchronous and asynchronous learning. Synchronous learning involves a teacher and a student engaging at a specific time, and asynchronous learning involves a student learning at any time convenient for them, i.e. a teacher develops a course and puts it on an Internet platform, and students get acquainted with materials provided and complete tasks. The advantage of this technology is that students, based on their individual abilities, can devote as much time to studying the materials as they need to understand and memorize, and can also return to the past material at any time to repeat the topic.

Materials and methods. Research methodologies in studying school-university collaborations have evolved alongside digital technologies. A mixed-methods approach, combining quantitative surveys and qualitative interviews, provides a comprehensive understanding of the nuances in collaborations. Additionally, case study methodologies often leverage digital tools to document and analyze collaborative initiatives, offering insights into best practices and potential barriers. The basis for the study was the data from anonymous surveys on the topic: «Digital Technologies in Collaboration Between Schools and Universities» which were created and distributed with the help of Google Forms and documents such as the cooperation agreement between the school and the university and their reports on the work done. The conclusions are based on a theoretical analysis of scholarly material and study of empirical material.

Research tool and participants. The research base is Taraz, Taraz regional university named after M.H. Dulaty and Almaty, Al-Farabi Kazakh National University and their cooperating schools. M.H. Dulaty Taraz Regional University cooperates with Gymnasium No. 40. The purpose of cooperation is as a base of pedagogical and industrial practice, a dual training program. Kazakh national university named after Al-Farabi cooperates with school gymnasium No. 79, the "Russian language and culture" center and Republican specialized center named after Abai.

The study participants are school and university teachers in these organizations (n=88). The questionnaire consists of 4 parts, 15 questions.

Results. *Section 1*: General Information

According to the results of the study, Taraz (n=41) and Almaty (n=47) teachers took part in the study. Overall 47,7% University teachers, 52,3% School teachers.

Figure 3 shows the most selected one? of the questions in Section 2. *Section 2:* Use of Digital Technologies: 1. *Which digital technologies are most commonly used in your institution for collaboration with other educational institutions?*- Video Conferencing Tools (e.g., Zoom, Microsoft Teams)-90% (Figure 4), Learning Management Systems (e.g., Moodle, Blackboard)-2%, Collaborative Tools (e.g., Google Workspace, Microsoft 365)-1%, Online Assessment Tools-5%, Cloud Computing Platforms-1%, Others-1%; 2. *How frequently do you use digital technologies to collaborate with schools/universities?*- Daily-98%, Weekly-2%; 3. *In what ways do digital technologies enhance collaboration between schools and universities*?- Access to shared resources and content-78%, Easier communication and coordination-10%, Student data sharing and analysis-8%, Professional development and training-4%.

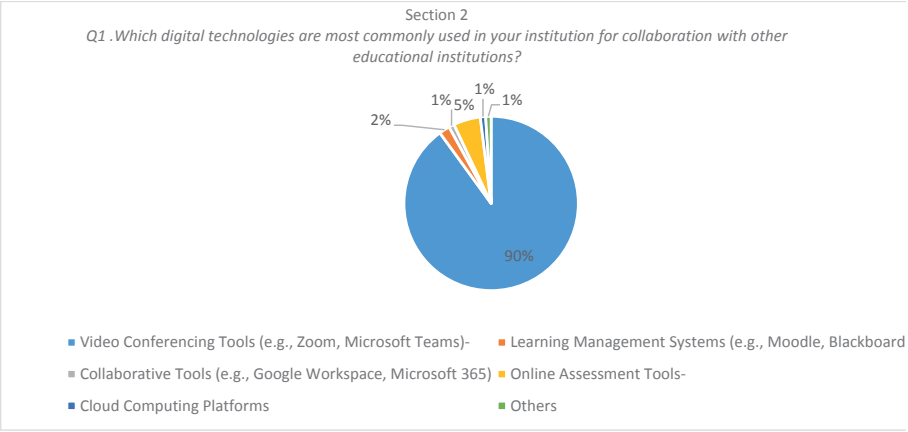

Figure-3. The answer to the question "Which digital technologies are most often used in your educational institution for cooperation with other educational institutions?"

Section 3: Impact on Teaching and Learning: *How effective are digital technologies in supporting joint curriculum development between schools and universities?*- Very Effective-97%, Effective-3% (Figure 5); *To what extent do digital technologies improve student transitions from school to university?*- Significantly improve-95%, Somewhat improve-3%, No noticeable impact-2%; *How do digital technologies facilitate personalized learning for students across both school and university settings?*- Highly facilitate-93%, Facilitate-6%, Neutral -1%; *What challenges have you encountered in using digital technologies for collaboration between schools and universities?*- Lack of training or expertise- 60%, Resistance to change-22%, Data privacy concerns-5%, Insufficient funding or resources-13%.

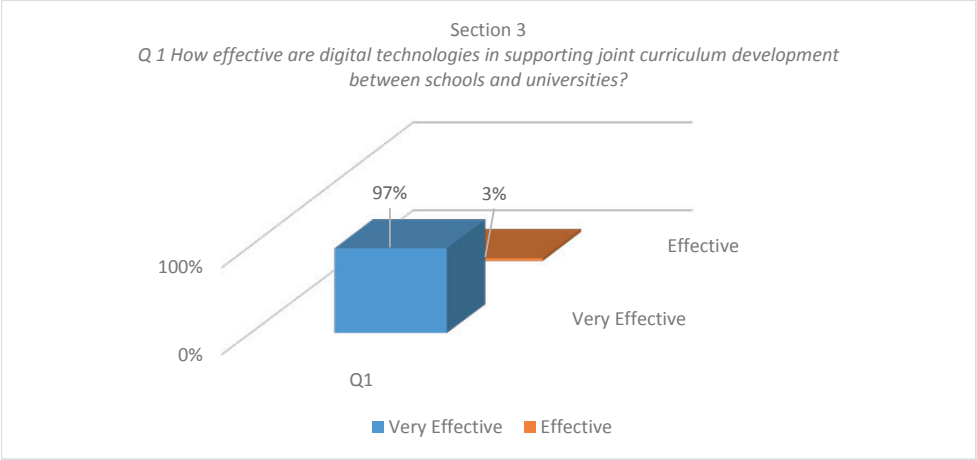

Figure-5. The answer to the question 'How effective are digital technologies in supporting joint curriculum development between schools and universities?

Section 4: Future Perspectives: *In your opinion, what is the most significant benefit of using digital technologies in collaboration between schools and universities?*- Enhanced communication and coordination-25%, Improved access to resources-22%, Better alignment of curricula-24%, More efficient administrative processes-16%, Greater support for student transitions-13%; *What areas of collaboration could be further improved with the adoption of digital technologies*?- Joint research initiatives-34%, Curriculum alignment- 35%, Teacher and faculty training, Student engagement and support Resource sharing-31% , *How likely are you to recommend the increased use of digital technologies in school-university collaborations?, What additional digital tools or technologies would you like to see implemented to improve collaboration between schools and universities? Any other comments or suggestions regarding the role of digital technologies in collaboration between schools and universities?*

These diagrams showed provide a clear visual representation of how digital technologies are used and their impact on collaboration between educational institutions. As a result of the survey, we can see the importance and role of digital technology in cooperation between schools and universities.

Discussions. This study set out to examine how digital technologies support collaboration between schools and universities in Kazakhstan, drawing on community of practice theory, constructivist learning perspectives, and systems thinking. Overall, the survey results (n = 88) suggest that digital tools are not simply "technical add-ons," but function as key mediators of joint work—especially communication, coordination, and shared curriculum development—while also revealing persistent capacity gaps (training, resources, and change management). A central pattern is the overwhelming reliance on video conferencing tools (90%) and the very high rate of daily use (98%)**.** This indicates that collaboration is happening frequently, but

mainly through synchronous communication. From a community of practice lens, this makes sense: regular interaction sustains participation, shared language, and joint problem solving. However, the low use of LMS (2%) and collaborative suites (1%) suggests that the collaboration ecosystem is still weak in the areas of knowledge management, artifact co-production (shared documents, shared repositories), and long-term accumulation of shared resources. In other words, partnerships may be strong in "meeting together," but less mature in "building shared systems" that retain institutional memory.

Respondents rated digital technologies as very effective for joint curriculum development (97%), and reported strong benefits for student transitions (95% significantly improve) and personalized learning (93% highly facilitate). These extremely positive ratings align with the idea that digitalization reduces barriers of time and distance, enabling faster coordination and access to university expertise—especially important in a country prioritizing modernization and equitable access across regions.

At the same time, because the data are based on self-reports, the strength of these evaluations may also reflect optimism, social desirability, or the fact that participants were already involved in active partnerships (which can increase perceived success). In future work, these perceptions would benefit from triangulation with observational data (records of joint activities, shared curriculum products, participation analytics, student outcomes).

Conceptualizing school–university collaboration as a research–practice partnership (RPP) emphasizes long-term commitment, mutual expertise, and shared decision-making. Your results show a clear demand for deeper partnership activity in the future: respondents identified joint research initiatives (34%), curriculum alignment (35%), and resource sharing (31%) as the main areas that could be improved through technology. This matches the RPP logic: collaboration is evolving from occasional support toward co-design and co-research.

However, RPPs also require shared tools for documentation, co-authoring, data governance, and iterative improvement—not only meetings. The current tool profile (heavy video conferencing, minimal LMS/collaboration platforms) suggests that partnerships may not yet have the digital "backbone" needed to sustain co-design cycles, archive products, and distribute leadership across institutional boundaries.

Conclusion. Digital technologies have become indispensable tools in researching and facilitating collaboration between schools and universities. By enhancing communication, data collection, and shared resources, these technologies support more meaningful partnerships that benefit both educational institutions. Continued investment in digital infrastructure and research initiatives is essential to maximize the potential of these collaborative efforts, ultimately contributing to improved educational outcomes for all learners.

While digital technologies play a crucial role in fostering school-university collaboration research, several challenges persist. Issues related to data privacy, accessibility, and the digital divide can hinder the efficacy of these technologies.

Furthermore, logistical concerns, such as varying levels of technological proficiency among educators, can impact the success of digital collaboration initiatives. The digital divide, for example, refers to the gap between those who have access to digital technologies and those who do not. Schools and universities must work together to ensure that all students have access to the necessary tools and resources, regardless of their socioeconomic background.

The findings of this study underscore the pivotal role that digital technologies play in fostering collaboration between schools and universities. Video conferencing tools, learning management systems, and other digital platforms have become indispensable in enabling efficient communication, resource sharing, and professional development. As digital technologies continue to evolve, their potential to enhance educational collaboration will only grow. Educational institutions must therefore invest in digital infrastructure and training to fully harness these technologies, ensuring that collaboration between schools and universities remains robust and effective in the digital age.

Finally, ongoing professional development is necessary to ensure that educators are equipped to use digital technologies effectively. Both schools and universities should invest in training programs that help teachers and faculty stay up-to-date with the latest tools and best practices.

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