Improving tertiary education via remote learning: Insights from students and educators

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Abstract

Relevance. The growing adoption of distance learning in higher education necessitates an understanding of the pedagogical conditions that facilitate its effective implementation.

Purpose. This study aimed to identify the pedagogical conditions that support successful integration of distance learning technologies in higher education.

Methodology. A questionnaire survey was conducted among 206 first- to fourth-year pedagogy students, complemented by interviews with 28 teachers. The survey and interviews focused on experiences, advantages, and disadvantages of distance learning from both students’ and teachers’ perspectives.

Results. The findings revealed that 89% of students favoured distance learning, highlighting benefits such as time and budget savings, comfortable home learning environments, easy access to necessary information, and flexible learning schedules. However, 11% of students reported dissatisfaction due to issues like internet outages, perceived lower quality of education, and lack of communication with peers and instructors. Teachers identified several challenges, including students’ information assimilation, their own adaptation to teaching in distance formats, and administrative hurdles.

Conclusions. Distance learning technologies, distinct from traditional methods, emphasize independent student activities and the use of information technology for knowledge exchange. Addressing the identified challenges and leveraging the benefits can significantly enhance the distance learning experience.

Keywords: student adaptation; self-education; network technologies; digitalisation in education; pedagogical conditions.
Introduction
Distance education (DE) involves the full or partial delivery of classes via telecommunication and computer technology. Modern DE is rapidly being introduced at different stages of education. The reason for this is that DE enables students to achieve their own goals, to develop their personality using information technology in learning. Distance learning helps to apply the acquired knowledge, skills, and abilities to reasonably solve life issues, successfully use them in different situations [1]. Distance learning is needed by students who cannot be present in class every day. There is a chance for them to study the learning material in a random sequence with an individualised optimum learning pace. Professional teachers not only present the material studied, but also design the learning process, making it as interesting and attractive as possible, using interactive learning tools and technologies (online games, presentations).

The study of distance education technologies for students is under close attention of Kyrgyz researchers. According to N.D. Imashbekova [2], adaptation of teachers to the global educational context using online learning is a change in the educational model that has occurred and is rapidly gaining momentum in development. The findings of the researcher show that the majority of students choose this type of education, and it positively affects their performance. However, it is also worth investigating the changes in educational models on the territory of Kyrgyzstan, training using interactive technologies and electronic teaching aids for familiarisation with lecture material, laboratory, and practical classes.

D. Shamatov and S. Bahry [3] believe that DE ensures the development of skills, abilities, and competences that meet the modern requirements of the labour market and open new opportunities not only for students but also for teachers, where students are entitled to choose educational institutions without being tied to a territorial location and abroad. In their study, they proved that flexibility and choice of study time is the main advantage of the DE process, and one third of the surveyed students rated online learning quite highly. By creating and improving virtual networks together with the number of online events organised by scientists and research institutes of the country, the quality of knowledge will reach a prominent level and become balanced and massive.

The worldwide shift to DE during the pandemic was a pivotal moment for the conventional form of education, forcing universities to rethink the entire system and structure of education. N.A. Abdybekova and K.U. Eliseeva [4] conducted a sociological study among university teachers who switched to the DE format on the importance and quality of teaching in the current conditions. The researchers believe that in the future, universities will define their role and improve work programmes in the conventional form according to the requirements of students. There is a need to thoroughly consider the communication technologies that enable DE at the level of international format, to strengthen virtual links between the actors involved in the process.

However, according to the survey results of Z. Zhorobekova et al. [5] among students who use social networks for educational purposes, a quarter of students choose this type of learning only for communication and entertainment. Students use online platforms as a way to socialise, as a way to discuss homework, but not as a professional learning methodology; in current teaching it is a secondary method of conducting classes which, when used in the educational process, can be helpful as a means of improving the quality of education since online platforms have an increasing impact on students. Going forward, it is worth exploring online platforms with user-generated content directly for learning and improving the quality of education.

Referring to the opinion of G.A. Adanır et al. [6], the development of technology in education leads to the development of distance learning, increasing the number of students in general. The results of the ongoing experiment of the researchers showed that students generally find text-based course notes for online learning, interactive technologies more useful, but online chat rooms and social networks are less favoured. It is important to consider students’ preferences regarding the choice of methods of educational resources, as well as to identify preferences in the choice of forms and methods of communication in DE.

According to C.R. Kulueva et al. [7], guaranteeing the quality interaction of all subjects in the learning process is an essential factor in the effective implementation of DE. The findings of the researchers’ study summarise the following aspects: constant assistance to the teaching staff of methodological and psychological nature is necessary; the teacher should be proficient in all forms of organising DE and independently adjust the education programme; adhere to feedback from the learner; create favourable conditions for staying in the online space. In the future, it is worth considering the opinions of parents as transmitters of certain cultural values and educating and informing them about the learning structure.

S.B. Bodbaeva and A.A. Akylbekova [8] considered the problems that arise in preschool education: lack of access to the Internet, difficulties of learning and teaching in the online environment faced by both students and teachers. However, the outcome of the researchers’ study shows that the benefits of DE do prevail. It is worth investigating the ways of solving the above problems on quality teaching of the stated form of education in greater detail.

Modern Kyrgyz science does not pay enough attention to the study of information technology in distance education, there is a need to investigate the problems faced by students in DE. All the above motivates researchers to find new ways to investigate the use of online technologies in education. Hence, the purpose of this study was to examine the pedagogical conditions, advantages and disadvantages in the application of distance technology in learning. The purpose defined the objectives: to investigate the advantages and disadvantages of DE; to analyse distance technologies used in higher education, their forms and methods of application in DE; to determine the relevant pedagogical conditions in the organisation of online education.
Materials and Methods
The study of pedagogical conditions that would successfully model with distance learning technologies (network and case-based) in the field of higher education was held with 1st-4th-year students of speciality “Pedagogy” of the Institute of Continuous and Distance Education of K. Karasaev Bishkek State University. The study involved 206 students who were in years 1-4 at the time of the study. An interview was also conducted with 28 lecturers at the said institute to determine the quality of education of the students (Table 1).

Table 1. Demographic characteristics of the study participants

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>90</td>
<td>18-28</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>68</td>
<td>19-35</td>
<td>39</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>21-42</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>23</td>
<td>21-35</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>1-4</td>
<td>29</td>
<td>29-54</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Teachers</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: compiled by the authors of this study.

The key criteria for the selection of these students was that the training classes of the 1st-4th-year are conducted according to the method of interactive learning tools, innovative technologies with the introduction of distance learning, and teachers apply the most innovative teaching methods.

The students’ satisfaction with distance education, quality of education, forms, and ways of learning were investigated according to the questionnaire method. Questionnaires were sent out using online links, emails, and face-to-face contacts. Students were asked to answer the following questions:
1. Is this the first time you have received education in the form of a DE?
2. If given a choice between forms of education, would you prefer the conventional form of education?
3. Are you satisfied with the DE?
4. Do you consider DE to be quality education?
5. Do you feel the absence of the instructor when studying? Would you like live interaction with fellow students?
6. Do you have problems accessing education platforms?
7. Have you been provided with the necessary learning materials?
8. Do you consider the time commitment to be a plus in DE?
9. Do you think that DE saves the family budget (tuition fees, housing costs, financial costs for food, accommodation)?
10. Do you find the home environment conducive to obtaining education through DE?
11. Are you comfortable with self-education, personalised learning schedule (pace, time)?

In the interviews, the university teachers answered “yes”, “no”, “different answer” to the proposed questions. They were asked 11 basic questions:
1. Do you feel a lack of communication with students in your teaching?
2. Do you consider the material and technical base at the institute sufficient for conducting distance education?
3. Do you make full use of DE’s fixed assets? Do you independently select the relevant material for the lessons?
4. Do you consider the networked technology of DE to be sufficient for teaching?
5. Do you consider the case-based technology of DE to be sufficient for teaching?
6. Do you conduct seminars online?
7. Do you think that when difficulties arise, the student always seeks the teacher’s help?
8. Do students always meet the specified deadlines in DE?
9. Do the institute’s faculty members have enough existing expertise to provide DE to students?
10. Does the administration of K. Karasaev Bishkek State University fully contribute to the solution of current problems and issues related to the application of distance learning technologies in the institute?
11. Do you have conflicts with parents of students, if yes, on what grounds?

In this study, a considerable amount of thematic literature was researched, which included scientific publications by researchers from different countries of the world who have been engaged in the investigation of distance education in higher education institutions.

Results
Starting in 2020 and with the pandemic sweeping the world, the demand for distance learning has skyrocketed. Informatisation is being introduced into all educational structures. Distance education has become the new standard of modern education. Many aspects contribute to this: there is an increasing number of students who want to study disciplines in depth, who are engaged in practical activities in parallel, there is a need for DE for students with disabilities. In these cases, the conventional form of education is replaced by DE under the guidance of a professional educator.

The origin of distance learning dates back to the middle of the 19th century in Europe, when “learning by mail” became popular, which is associated with the solution of functional possibilities of improving postal communication, qualitative and rapid growth of the education system with the expansion of the structure of universities, the functioning of specialised public and private educational institutions with the introduction of innovations in the education process. With such innovations in learning, the list of information technology is also expanding, and the conditions for the creation of a unified educational and information sphere are developing [9] All this leads to a new system of learning. In society there is a demand for a person who would possess fundamental knowledge, skills, and abilities with a creative and analytical mind, capable of self-organisation and self-development.
The main difference between conventional and distance education lies in the availability of a technological base. The conventional form of education focuses on the teacher-student learning system, whereas DE focuses more on interactive technologies and their active application in the learning process by the learners themselves [10]. Distance learning is an innovative educational organisation that operates on the principle of self-education, where learners are distanced from the educator online and engaged outside of time. The main goal of DE is to provide learners are distanced from the educator online and engaged outside of time. The main goal of DE is to provide learners with educational plans and programmes at home with the use of interactive innovative pedagogical and computer-information technologies in the educational process. Such an organisation is an information centre, which appears as a software shell for mastering each participant.

Professional training of a teacher working in the DE system differs significantly from the conventional one. A teacher in a higher education institution where distance education is used needs to be a well-rounded professional and have several “roles” in education. For instance, such as those present in Table 2.

### Table 2. The role of the teacher in DE

<table>
<thead>
<tr>
<th>Role</th>
<th>Course designer</th>
<th>Controller</th>
<th>Tutor</th>
<th>Organiser</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE administrator</td>
<td>Selection of necessary materials, student assessments</td>
<td>Monitoring student learning, checking assignments</td>
<td>Student support (supervisor)</td>
<td>Organisation of the training process, consultations</td>
</tr>
</tbody>
</table>

**Source:** compiled by the authors of this study.

That is, the role of a modern teacher in higher education institutions is very diverse, multifunctional, and excessively important for the professional training of students. Teachers need to constantly improve their qualifications and develop their skills using modern innovations to meet the current requirements of curricula. The tutor guides students throughout their studies, assists them in assimilating the programmes and provides feedback during the learning process. In the development of the courses, the DE is guided by the transformation of previously developed curricula and courses into the structure of the information environment. For curriculum design, the educator applies their interactivity, knowledge of instructional design, and instructional materials methodology. An instructor who thinks in obsolete concepts should not teach the modern student and create a platform for learning. They should be creative, intuitive, original, empathic, critically thinking, and motivate students to learn. The teacher is entitled to choose the ways and methods of conducting training sessions, forms of knowledge control, develop a system of feedback with all participants in the process, provide learning assistance, make forums and chats with students of the course, lead the activities of groups of students involved in certain projects, as well as analyse the outcomes of student learning and adjust the content of the course [11].

A DE student must have an initial level of knowledge, self-organisation and perseverance. For them, it is individualised learning where the student has internal management of education. The specific feature of DE is to meet the needs of the student through online learning and in the aggregate continuous education due to the need for constant growth of skills, knowledge, and abilities. DE has a range of advantages as well as disadvantages (Table 3).

### Table 3. Advantages and disadvantages of distance education

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student can learn at a distance, with no geographical limitations</td>
<td>Lack of personal communication between students and instructor, which may entail ineffective learning outcomes</td>
</tr>
<tr>
<td>Education is available for people without health contraindications</td>
<td>Creation a living environment that meets learning requirements</td>
</tr>
<tr>
<td>Distance learning is more financially accessible than the conventional form</td>
<td>A need for continued access to educational sources</td>
</tr>
<tr>
<td>Self-organisation in terms of schedule and pace of learning</td>
<td>Material and technical requirements: computer, internet access, phone, or tablet</td>
</tr>
<tr>
<td>DE perspective</td>
<td>Lack of educational supervision of students</td>
</tr>
<tr>
<td>DE allows working in parallel, applying knowledge in practice</td>
<td>Lack of preparedness in curricula</td>
</tr>
<tr>
<td>DE has modern, innovative methods and materials</td>
<td>Underdeveloped curricula and courses</td>
</tr>
<tr>
<td>Individual timetable for the student</td>
<td>Lack of professionalism among educators</td>
</tr>
</tbody>
</table>

**Source:** compiled by the authors of this study based on M. Aristidou and S. Cross [12]

DE has even more advantages and disadvantages, but it is a rapidly developing education system, which can influence the population and professions by the method of social interaction. For a student with a personality-oriented individualised approach in learning, it is a method of achieving pedagogical objectives and the educational and informational sphere that receives innovation, combines a considerable amount of material and technical means that
aim to create a broad outlook of students who get a profession in higher education.

Accordingly, it is important to introduce a massive number of innovative information technologies, methods, ways, techniques for their development. Considering the disadvantages of DE, it is necessary to mention the possible ill health of students and teachers, excessive work at the computer affects eyesight, gastrointestinal tract, decreased physical activity. Since DE technologies are only possible through Internet networks and technical means, in most cases students use social media for non-educational purposes. Distance learning entails self-management and self-learning, where the connection of communication between teacher and student is lost, but it must be recognised that there is factually a complete lack of contact between all participants in the educational process, i.e., all communication is reduced to a digital process of communication.

Distance learning enables students to obtain a degree in education regardless of their individual capabilities (social equality, age, nationality). Successful learning in DE requires an innovative computer platform and uninterrupted access to Internet resources, appropriate teacher education and sound lesson preparation, and incentives for DE. The specificity of distance education is its ability to meet the needs of the learner, due to the mobile, virtual form of learning, and the needs of society in the field of continuing education, as there is a need to develop knowledge and skills [13]. Principles of higher professional education are certain rules that define the relationship between the basic learning objectives of subject matter experts with higher education and the laws that control professional learning in these institutions. In the HEI sector, the principles of DE can be categorised as follows (Figure 1).

![Diagram showing principles of distance learning in higher education](Image)

**Figure 1.** Principles of distance learning in higher education

**Source:** compiled by the authors of this study.

The principle of humanisation is characterised by the fact that education is beyond time limits, it is self-selection and self-education, combining work and study. The principle of interactivity shows the pattern of students’ connections with the teacher and classmates. During DE, the exchange of information and materials is more predominant between students than teacher-student communication. This principle is characterised by the fact that during practical classes, students are provided with a personal login and password for the educational activities carried out. The principle of initial knowledge implies initial education (knowledge) for successful DE, e.g., personal computer skills to use Internet resources.

The principle of individualisation is a kind of control over the factual learning of material and adjustments to educational courses. For instance, creating a personalised learning plan that will influence quality learning in the future. The principle of systematic learning is characteristic in its application to 1st-3rd-year students for the implementation of planning and control of learning. The principle of flexibility shows that there are no age, gender, national restrictions in learning, no criticism of the learning process of DE in time limits. This principle allows students to adjust or supplement the learning programme. The principle of identification highlights the importance of technical means for self-learning control. For instance, during an online conference, it is possible to identify who is present. Identification is part of student safety [14]. It is worth adding that in distance learning in higher professional education, most programmes make provision for face-to-face weekend or evening classes, but students do not have to be present in the classroom all the time. Some educational institutions run two-day or one-day off-premises learning, which can bring students together at weekends for group work.

Information technology refers to software and hardware that is based on the application of computer technology. They make provision for the processing and storage of learning material, its delivery to the student, and the interactive relationship between the student and the educator. In IT-enhanced learning, the rate of achievement of learning objectives is also significant. DE technologies are learning technologies, they are not a form of education, they constitute a set of means, methods, and forms of learning to implement a given amount of learning. These technologies are oriented to the application of didactic means of knowledge, scientific principles of studying and planning the process of DE. Such technologies are used in part-time, full-time, and externships [15].

The main thing in students’ self-education is the focus on the learning material. Therewith, the workload of the teacher is increased through supervision and management, preparation for classes, and counselling. This method of presenting information arouses students’ interest in the learning process, initiative in classes, self-organisation. The introduction of information technologies in the learning process encourages students to work with electronic resources and textbooks. Working independently, students go through the material studied using professional special periodicals, monographs, various kinds of research.

Distance learning is of the following types: chat classes, web classes, and teleconferences. Chat classes are conducted using computer technology. They are conducted synchronously, where all participants share an activity at the same time. Most distance education institutions have a chat school where distance learning takes place with the help of special chat rooms. Web classes are classes, conferences, lessons, seminars, games, practical and laboratory work, and other types of classes that are conducted by means of telecommunications and Internet.
resources. Teleconferences are conducted by email distribution. The main purpose of their implementation is to achieve the learning objectives. Webinars are also relevant in the educational environment and are actively used by teachers. A webinar is a web conference based on online consultations, online presentations over the Internet, and other interactive features. During the webinar, each learner uses their own computer, communication is via the Internet, using special training software that is installed on the student’s work computer, or is used through a web application. It is worth saying that through the web application is very convenient to use because there is no need to install software on the students’ work platforms. Webinars allow for full interaction between students and educators.

The main technologies of DE include telecommunication technologies, case technologies, and network technologies. Case technology provides students with information learning resources in the form of a specialised set of methodological complexes for self-study using different information media. Network technologies are based on the use of local and global computer networks to provide students with access to educational resources and the organisation of a system of methodological and software methods of management, implementation of the process of education, regardless of the geographical location of subjects. Telecommunication technologies are built on the use of satellite-based transmission and broadcasting mechanisms, local and wide area networks for seamless student access to educational platforms such as digital libraries, online manuals, and reference books. Innovations are gaining popularity and relevance for the growth of specialists in the republic. A great importance is given to distance learning, both worldwide and in Kyrgyzstan. Educational portals for distance learning, tools, software, technologies, and methods of DE are being created.

The DE programme uses various modern ways of delivering information to the student: television, audio or video broadcasts, radio, internet conferences, online broadcasts. More developed and popular forms of DE are management games and online stimulators (e.g., transport broadcasts. More developed and popular forms of DE are video broadcasts, radio, internet conferences, online delivering information to the student: television, audio or teaching elementary basics of management, management simulators, business games, economic games.

Table 4. Distance learning methods

<table>
<thead>
<tr>
<th>No.</th>
<th>Learning method</th>
<th>Characterisation and specific feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Self-learning method</td>
<td>The educator creates an educational learning platform from which information reaches the student via telecommunication networks</td>
</tr>
<tr>
<td>2</td>
<td>Individualised method</td>
<td>This method involves individual counselling to the teacher through phone, email, Skype, or WhatsApp.</td>
</tr>
<tr>
<td>3</td>
<td>Method of presentation of information by the educator</td>
<td>Used for student counselling (audio, video lectures) distributed on Internet resources through noticeboards</td>
</tr>
<tr>
<td>4</td>
<td>Method of interaction between participants of the educational process</td>
<td>Focuses on group work, where the teacher is responsible for discussing and preparing the material received, developing plans and programmes</td>
</tr>
<tr>
<td>5</td>
<td>Project method</td>
<td>Implies an integrated process where the student is autonomous in planning and controlling learning activities</td>
</tr>
<tr>
<td>6</td>
<td>Problem-based learning method</td>
<td>It involves solving complex questions, problems, where the student’s attention is focused on actions that increase cognitive activity</td>
</tr>
<tr>
<td>7</td>
<td>Research method</td>
<td>Focuses on the use of certain meaningful and relevant problems and allows students to find a method of solving them</td>
</tr>
</tbody>
</table>

Source: compiled by the authors of this study based on Y. Huang et al. [15].
There are remote access learning tools implemented through innovative technologies: educational books, methodological manuals, training plans in multimedia version, audio and video materials, laboratory workshops, simulators, electronic libraries, databases. Pedagogical conditions for the application of distance learning technologies in higher education are defined as a set of circumstances of the learning process and the properties of the learner, which are involved in the general attitude towards education. Successful pedagogical conditions for effective preschool education include personnel support (teachers, methodologists, tutors with appropriate professional training and qualification level); material and technical base (computer equipment, access to the Internet); methodological support (software training materials, educational platforms). Pedagogical conditions affect the overall process of DE, not only certain stages of learning, and such conditions necessarily accompany the entire educational process [16].

Investigation of a set of pedagogical conditions that would successfully model with distance learning technologies (network, case study) was held with students of the Institute of Continuous and Distance Education of K. Karasaev Bishkek State University. The Institute is a leader in distance education in the country. The Institute is one of the innovative educational institutions, the principles of which are based on e-learning. Its main motto is “receiving education is the student’s self-learning”. The format of distance learning at the Institute is a combination of interactive innovative self-learning and consulting assistance of teachers, as well as a set of technologies, with providing learning material and close cooperation with the teacher. The institute presents a combined model of DE; the classes use different kinds of teaching materials presented in a visual form for qualitative assimilation of the set tasks. All training materials in the institute have six implementation units (Figure 2).

![Figure 2. Educational materials of the institute](image)

**Source:** compiled by the authors of this study.

Lectures are presented in text form with graphs, tables, illustrations, and flash movies, which makes learning the material visual, interesting, and vivid. The material is usually filed in modular form. Interactive laboratory workshops form the operation of instruments and equipment identified by the education standard. Practical fulfillment of the lessons lies in repeating and consolidating the knowledge of theory. Such assignments are presented in text form with the addition of video or audio material. Seminars, student assessments, and tests show teacher-student communication online. Test and additional tasks, references to the studied material are given by the teacher to the student after completing the studied material. Based on the results of the tests, a grade is automatically assigned to the student.

The Institute uses network and case-based learning technologies. The teacher-student relationship takes place mostly face-to-face up to four times per academic year. With network technology, all materials are located on the institute’s server. This type of learning requires the student to work systematically on a computer and uninterrupted access to the Internet. This greatly reduces attendance at the institution, sometimes one can be there once a year for academic performance assessment. Case technology implies learning on the materials developed by the teachers of the institute (methodical sets of training courses, tests and tasks for self-control, collections of exam questions for self-preparation for control exams) and active involvement in the educational process. 1st-4th-year students of the speciality “Pedagogy” of the mentioned institute in the number of 206 people answered the conducted questionnaire to determine the degree of satisfaction with distance learning and the quality of education (Figure 3).

![Figure 3. Degree of students’ satisfaction with DE](image)

**Source:** compiled by the authors of this study.

The survey results show that those who receive education in this form for the first time would prefer the conventional form, as they feel the lack of communication between the teacher and classmates to a greater extent. 89% of respondents are satisfied with the quality of DE. Degrees of dissatisfaction for 11% of students include internet outages, home conditions, and incomplete access to study materials. There were 11 questions in the interview with the teachers of the institute. 28 teachers answered “yes”, “no”, “different answer” to the proposed questions (Figure 4).
Source: compiled by the authors of this study.

From the outcome of the teachers’ interviews, it can be seen that both case-based and network learning technologies should be present in the education process. The following aspects were voiced that require improvement: students’ assimilation of information, deadlines for handing in tests, lack of teaching experience in conducting this type of classes, administrative issues. Educators have no conflicts with parents, only issues of student compliance with deadlines. At the end of the surveys, three main stages of teacher transformation were identified from routine involvement in programme design to research into possible explorations of the processes that are present in the curriculum. The first step is to create a situation where a teacher feels the need to transform. The second stage is action (formalising the activity in an information platform format). The third stage is characterised by the involvement of content from related disciplines in the learning process, i.e., going beyond the programme.

The pedagogical conditions that contribute to the qualitative implementation of DE technologies in the programme of the Institute of Continuing and Distance Education of K. Karasaev Bishkek State University were identified as follows: value bases; content of the training programme with changing pedagogical issues; dialoguing and problematization of learning material. It is also noting that the main condition is the self-determination of the teacher. In such a condition lie the educator’s humanistic values, their intellectual potential, and personal qualities of empathy. In addition, it was found that the presence of a teacher and classmates in the classes still helps in learning, makes the process emotionally rich and interesting, motivating. Motivation and lively emotions are quite hard to sustain within the framework of DE, and often adaptation and planning of the educational perspective of the lesson is necessary. It is important to add that, as practice shows, students and teachers alike face enormous difficulties that hinder successful and effective learning: adaptation to online classes; low level of computer literacy; technical issues, lack of access to the Internet; inability to manage their time, lack of planning; lack of self-motivation among students; social lack of communication.

Finally, DE is also applicable to second higher education, for certificates of completion of professional development courses. Since there is a shortage of qualified personnel in modern education, who are skilled in developing effective courses for DE, creative thinking and competent modelling of the educational process, DE will help to solve these problems as a secondary mode of education.

Discussion
The above results provide innovative insights into the role of distance technology in higher education teaching. The study contributed to the definition of the role participation of educators, opened and expanded the understanding of the impact of DE technologies on education in general. The findings obtained in the study have implications for practitioners and researchers. It is important to integrate these technologies into education, aligning them with the goals of higher education.

Analysing the findings obtained in the study, it can be seen that preschool education is impossible without the use of modern information technologies and educational network platforms. Notably, the global pandemic has considerably affected the quality of higher education, students who were educated in the conventional form experienced a lack of interpersonal communication with professors and classmates. For effective and quality education, it is important for students to develop knowledge and practical communication skills in direct communication. Iranian researcher M. Sadeghi [17] also emphasises that all electronic tools are used to interconnect students with educators, thereby providing access to communication between students and overcoming the barrier of dissemination of educational programmes in the format of DE materials. Such tools are of great value for effective and quality education. In his study, the researcher named similar advantages and disadvantages, where the choice of the form of study depends only on the requirements and circumstances of the student himself. The value of the researcher’s article lies in the recommendations made to improve education in higher education of students.

Despite the considerable popularity of DE, the experience of many shows that this form of learning is not suitable for all learners. L.D. da Silva et al. [18] also investigated the advantages and disadvantages of DE. Most students consider the following disadvantages of DE to be as follows: technical failures – 5% of respondents; for 10% of respondents, the lack of communication is an obstacle; almost a quarter of respondents find it difficult to study in the DE curriculum; 35% answered that the education in this format is not of high quality; 15% complained about the increase in the amount of assigned material; 10% want to return to the conventional form of education. The researchers’ data showed benefits as well, and among them were those cited as in the results above: the ability to learn at a convenient time, pace, and budget savings. As a result of the study, it is stated that DE helps the majority in getting education, DE is a system that

![Figure 4. Interviews of teachers about the quality of students’ education](image-url)
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consists of the principles of independent learning where students are distanced from the educator in time and space.

Although distance learning has disadvantages, it still provides a massive advantage to those students who want more learning opportunities and a comfortable education. The biggest advantage, admittedly, is its cost. As mentioned above, the cost of distance learning differs substantially from the conventional form of education – it can be stated that DE is a working-class choice. It must be assumed that distance education courses and programmes are evolving, and will continue to do so in the future, but there are still some unclear issues that need to be clarified and explored.

F. Bouchikhi [19] examined the effectiveness of DE, generally showing positive results. However, in some cases, DE can be as effective as conventional learning in a group; online learning cannot replace conventional classroom education. Before choosing a DE programme, students should think carefully about whether they will get the suitable education and career goals for their needs. The findings of the researcher in a study conducted with students at the University of Algiers confirm the findings of the present study, where statistical data showed that communication barriers are the main problems that students face in learning. 40% of the respondents confirmed this judgement, while technical and cognitive barriers are not so prominent. The researcher believes that educators too should be trained to teach using online platforms for educational development and excellence. The researcher also provided recommendations to overcome the problems of online education.

Communication technologies are divided into two types: offline and online. Online technologies facilitate the exchange of documents, information in real time, e.g., a letter sent by the addressee, having reached the addressee’s monitor, is quickly redirected to a certain output device. When offline communication technologies are used, the letters received are stored on the recipient’s computer [20]. They can be read at any time. Not as in face-to-face teaching, communication is done online, where it can be present with the answer left behind. Researchers from Morocco, I. Lasri et al. [21], concluded that there is a neutral attitude towards distance learning in higher education institutions. Mostly positive for Psychology and Informatics, and negative for Biology and Chemistry. In their study, Moroccans exploring the DE platform put forward deep learning approaches to analyse people’s sentiment on the social network Twitter regarding distance learning in higher education institutions, which appeared to exceed the researchers’ expectations.

Referring to the results of this study, it is important to note that the key factor in the self-education of learners is the emphasis on the submitted material. M.C. Tamondong et al. [22] say in their work that the attitude of teaching staff and professional training and readiness to teach, precisely in the aspect of learning communication and competence in courses, have a noticeable impact on the quality of teaching when using distance learning technologies. The findings of this study show that the use of interactive lectures, online webinars provide an opportunity for students of the speciality “Pedagogy” to acquire practical skills online. It can also be concluded that an integrated approach is necessary for quality and effective DE. Innovative training programmes, effective support of mentors and the integration of online tools, contribute to the assimilation of theoretical material, as well as the development of practical skills that will be applied by future specialists.

Notably, the types of innovative technologies used by educational institutions was one of the programmes, e.g., in Chinese education, which was used during the school closures during the pandemic. The above pedagogical conditions agree with the findings of K.C. Li et al. [23], who analysed 247 publications on DE in higher education institutions. Researchers have identified the basic conditions of DE: learning technologies; teaching approaches and methods; DE teaching programmes; assessment activities. By also studying the pedagogical conditions of science teaching through distance education, researchers have identified four main aspects that encompass the use of online laboratories in science courses. These include developing DE based on virtual reality; encouraging the construction, application, and learning of educational approaches to DE; increasing interactivity in DE through the use of multimedia.

The structure and data of training material for distance learning should assume the possibility to apply this material in self-study for the learner. The format of such learning materials should be consistent with the educational programme, established state standards and higher education programmes. The structure should be shaped according to the specifics of the discipline and age group for which the material is applied. Application of some elements of DE technologies and specially created methodical aids in the format of conventional form of training of future professionals gives motivation to implement modern learning technologies, increases the efficiency and quality of higher professional education. M. Pinto and C. Leite [24] concluded that the overall impact of using information technology has a positive effect on student learning. Technology is used to promote active and effective attention to student learning in an educational environment inside and outside the classroom.

In terms of the impact of distance education format on learning, the analysis above identified that there is a significant result of the benefits of switching to DE. This result was labelled as positive by 89% of the survey respondents and indicates that the advantages of DE outweigh the disadvantages. The same findings were indicated in a study by T. Alasmari [25], which investigated the attitudes of learners educated in tertiary vocational institutions as well as teachers’ experiences of DE. The findings of the study state that DE has influenced the effectiveness of learning, and it is required for HEIs to make certain extra efforts to invest a massive amount of resources to support education, which will be able to cover the shortcomings and gaps in learning. The researcher believes that there is need for effective technical facilities and support from the faculty and the administration. It is also important for instructors to encourage students to avoid developing feelings of isolation.

In terms of the role of the instructor in distance learning, it can also be added that in planning and organising learning activities, they can master the tools and platforms for developing online courses at the highest
level. J. Kammer [26] notes that online training programmes should be tailored to administrative needs, recruitment, counselling. DE teachers can choose to apply conventional teaching models as well, or they can integrate new technologies and innovative pedagogy. The key factors that influence the future development of DE are the student population, an effective and competent education programme, accessibility, as well as the possibility of connecting students to innovations in education.

The lack of communication, the inability to contact the instructor in class, was also noted by students at the National Polytechnic Institute of Mexico. M.D. Lytras et al. [27] conducted a study during the COVID-19 pandemic, proving that students were negatively affected by distance learning due to the loss of face-to-face contact. DE also had some negative impact on the psychology of students (depression and irritability appeared) during the period under study. The findings of the researchers do not agree with the results of the present study. They point out that perceiving the learning processes of this format elicits solutions to the problems that emerge in the process of analysing learning. And the provision of valuable information on structuring guidelines and optimising the progress of these decisions by all stakeholders in the educational process is not available.

It is also worth mentioning the work of Malaysian researchers J. Rajadurai et al. [28], in which a similar degree of student satisfaction and performance of distance learning in distance and open education universities in Malaysia was determined. The researchers’ findings indicated a significant relationship between students’ academic performance and positive attitudes towards DE. The students are mostly satisfied with the study programme, online knowledge tests, academic assistance and services provided by the university. However, understanding the indicators of successful application of the education platform will enable the analysing universities above to take the important necessary steps to ensure successful implementation of education programmes.

K. Kubikova et al. [29]) conducted a successful study of factors affecting student adaptation to distance learning during a pandemic. The results of the questionnaire showed that the methods and programme of study play an important role, but equally important is the adaptation of students to the DE and the existing significant differences depending on gender, type of programme of study, and student preferences. The present study mentioned that the contact with the teacher-mentor is the main aspect of effective learning of students, maintaining the relationship with teachers is crucial for the application of adequate free pace of learning and choice of free time. As a result of the study, the pedagogical conditions for the application of distance learning technologies in higher education institutions were determined, such as staff support, with appropriate professional training and qualification level, material and technical base and methodological support, which are the main conditions for the optimal implementation of distance learning in higher education institutions.

Based on the results obtained, it is necessary to allocate sufficient funds for universities, firstly, for material and technical base, secondly, for training and professional development of teachers, and thirdly, to improve psychological and pedagogical competences of teachers who teach remotely. H.E. Vidergor [30] noted that the innovativeness of a teacher has quite a strong influence on their pedagogical practice; teachers with more than a decade of teaching experience feel professionally prepared to conduct lessons using DE technologies; have a prominent level of personal responsibility; consider themselves innovative; can imagine, generate, and apply new forms and ideas compared to teachers with little experience. As a result, the findings obtained not only in the present study, but also in the works of researchers from different countries helped to consider the pedagogical conditions of distance learning in universities and to study the form of distance education in general at a sufficient level.

Conclusions
The study considered distance learning technologies used in higher professional education, such as case technologies, telecommunication technologies, and network technologies. The findings showed that these DE technologies are significantly different from those used in the conventional form of education. They are aimed at students’ self-education using computer-based tools. The study also emphasised that for successful application of distance learning technologies in higher education institutions, it is necessary to have relevant qualified training of teaching staff, motivation of students, establishment of interconnection between teachers and parents, and uninterrupted work of Internet resources. Furthermore, it was found that the use of information technology in education can be an effective method of increasing students’ interest in learning. According to the data of the conducted survey of students, the disadvantages of DE are Internet connection interruptions, quality of education, lack of communication with classmates and teachers, while the advantages of students consider time and budget saving for travelling and accommodation, comfortable home learning conditions, accessibility of searching for necessary information, free choice of pace and time of study. The advantages and disadvantages of distance learning were also defined, innovative technologies used in higher education institutions were considered, and pedagogical conditions for the application of distance learning were named.

In summary, the present findings put forward actions to address the challenges faced by instructors and students during distance learning: the need for reliable technology; organising a conducive climate in the classroom; supporting contact between students and instructors outside the classroom; creating small groups when teaching; allowing students to assess their own skills, practising a system of flexibility to adjust student learning; using their capabilities and strengths skilfully; using their abilities and strengths skilfully; and providing students with the opportunity to assess their skills and abilities.

Future research should focus on the adaptation of DE students, person-centred method of DE of university teachers. The possibility of introducing other factors for alternative means of student and teacher surveys should also be explored. Future topics for study may also include the reasons that affect the mental state of distance learning.
students, to determine the impact of other aspects of education. This study has limitations that need to be further scrutinised. First of all, it should be stated that the data in this study is variable, which is likely to be subjectively biased. The number of students for whom the application of distance learning in higher education was studied is one cohort of 206 students.

An important mechanism of study in the future could also be research to show whether the findings covered other professions from DE institutes, as here data from only one institute on the impact of DE on students, pedagogical conditions of distance education application were obtained.

Therefore, more studies are needed from other universities in the country on the impact of distance learning on the overall education process. The study conducted provides value data for future research on the impact of DE on student performance and the application of technology to learning in the digitalisation era.

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**Conflict of Interest**

None.

**References**


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Вдосконалення вищої освіти за допомогою дистанційного навчання: Погляди студентів та викладачів

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Анотація

Актуальність. Зростаюче впровадження дистанційного навчання у вищій освіті потребує розуміння педагогічних умов, які сприяють його ефективному впровадженню.

Мета. Метою дослідження є визначення педагогічних умов, які сприяють успішній інтеграції технологій дистанційного навчання у вищу освіту.

Методологія. Було проведено анкетування 206 студентів першого-четвертого курсів педагогічних спеціальностей, доповнене інтерв'ю з 28 викладачами. Опитування та інтерв'ю були зосереджені на досвіді, перевагах та недоліках дистанційного навчання з точки зору як студентів, так і викладачів.

Результати. Результати показали, що 89% студентів віддають перевагу дистанційному навчанню, підкреслюючи такі переваги, як економія часу та бюджету, комфортне домашнє навчальне середовище, легкий доступ до необхідної інформації та гнучкий графік навчання. Однак 11% студентів повідомили про своє незадоволення через такі проблеми, як перебої з інтернетом, низька якість освіти та брак спілкування з однолітками та викладачами. Викладачі визначили кілька викликів, серед яких засвоєння інформації студентами, власна адаптація до викладання в дистанційних форматах та адміністративні перешкоди.

Висновки. Технології дистанційного навчання, на відміну від традиційних методів, акцентують увагу на самостійній діяльності студентів та використанні інформаційних технологій для обміну знаннями. Вирішення виявлених проблем та використання переваг може значно покращити досвід дистанційного навчання.

Ключові слова: адаптація студентів; самоосвіта; мережеві технології; діджиталізація освіти; педагогічні умови.