Modern Education
Правильная ссылка на статью:
Golovkina M.V. A Comparative Analysis of the Effectiveness of Distance and Traditional Learning Technologies in Universities // Современное образование. 2024. № 1. С. 41-52. DOI: 10.7256/2454-0676.2023.4.68854 EDN: LSJHSX URL: https://nbpublish.com/library_read_article.php?id=70599

A Comparative Analysis of the Effectiveness of Distance and Traditional Learning Technologies in Universities / Сравнительный анализ использования дистанционных и традиционных технологий обучения в высшей школе

Головкина Мария Вилевна

ORCID: 0000-0002-7825-7565

кандидат физико-математических наук

доцент, кафедра физики, Поволжский государственный университет телекоммуникаций и информатики

443010, Россия, Самарская область, г. Самара, ул. Л. Толстого, 23

nauka77@yandex.ru

Статья из рубрики "Массово-информационные процессы в обучении"

DOI:

10.7256/2454-0676.2023.4.68854

EDN:

LSJHSX

Дата направления статьи в редакцию:

01-11-2023

Аннотация: В статье проведен сравнительный анализ результатов обучения студентов высших учебных заведений при использовании двух различных форм обучения: традиционного оффлайн обучения и дистанционного обучения. Рассмотрены особенности дистанционного обучения, выявленные в процессе широкого использования дистанционных технологий во время эпидемии COVID –19. При проведении исследования учтено широкое внедрение цифровых технологий как в дистанционном, так и в традиционном обучении. Предметом исследования является влияние различных форм организации учебного процесса на результаты учебной деятельности. Цель исследования: выявить наиболее подходящие в эпоху глобальной цифровизации формы обучения, которые обладают максимальной эффективностью в современных условиях. В качестве метода исследования использован сравнительный

анализ результатов обучения в дистанционном и традиционном формате, полученных во время пандемии COVID –19 и после нее. Рассмотрены как оценки студентов, так и материалы смешанного анкетирования обучающихся в высших учебных заведениях на различных специальностях. В качестве объективных критериев эффективности обучения были приняты: оценки студентов, средний балл во время аттестации, количество студентов, которые успешно сдали предмет. Несмотря на трудности объективного сравнения результатов обучения, связанные с тем, что итоговая аттестация в дистанционном и традиционном формате проводится в различных условиях, удалось выявить различия между разными видами обучения. В целом было показано, что студенты, проходившие обучение в традиционном формате, получали больше профессиональных умений и навыков по сравнению со студентами, обучавшимися дистанционно. В результате проведенного исследования сделаны выводы о предпочтительных формах обучения, обладающих наиболее высокой эффективностью. К таким формам в настоящее время относятся традиционное обучение, использующее весь арсенал подачи современного цифрового контента, а также смешанное обучение, использующее как контактные, так и дистанционные формы занятий.

Ключевые слова:

высшее образование, цифровизация образования, дистанционное обучение, смешанное обучение, мотивация студентов, электронный образовательный контент, образовательные технологии, социальное взаимодействие, успеваемость, удовлетворенность

Previously published in Russian in the journal *Pedagogy and Education.*

Currently, digitalization has covered all spheres of human activity, including education. As a result, digital learning technologies, which are used both remotely and in traditional face-to-face learning, have become an integral part of the educational process. The availability of digital tools has made it possible to conduct real distance learning, which has many advantages compared to traditional offline learning. The main advantage of distance learning is the possibility of obtaining a high-level education without leaving for another city and without leaving work, which allows a huge number of people to gain additional education, take advanced training courses, and acquire a new profession in the process of online training. The undoubted advantages of the distance learning format—time flexibility and the ability to take classes conveniently and from anywhere in the world—have led to the widespread introduction of various distance learning courses, including university courses, into the education system. But, despite the advantages, the distance learning format also has disadvantages, which may affect the result of training when receiving a bachelor's or master's degree at a university in a distance format. A deep comparative analysis of various teaching methods is required: traditional, which involves personal communication between students and a teacher in the classroom but using the latest digital technologies, and remote, which is conducted online. It should be clarified that, at present, digitalization can be considered an integral element of both traditional and distance learning. Therefore, when comparing the two forms of education, it is necessary to separate the impact of the use of digital technologies from the influence of various forms of educational process organization: the traditional form of education with personal contact with the teacher and fellow students or the remote form without personal contact. However, it should be remembered that digitalization and the use of electronic content in distance

learning covers all aspects of the learning system [1, p. 117], which does not happen in traditional learning. At the same time, both distance learning and traditional face-to-face learning are transforming educational relationships that are fully or partially transferred to the virtual space using new forms and opportunities in these relationships [2, p.1160].

The COVID-19 pandemic was not only a powerful impetus for the use of distance technologies at all levels of education [3. p. 115] but also allowed some quantitative assessments to be made when comparing the training results in the traditional and distance formats. In general, the use of distance learning during the pandemic showed not only the effectiveness of using online technologies in education but also identified several problems that need to be solved when using distance learning. The issues of using distance learning technologies in teaching students of higher educational institutions include the following [3–7]:

– lack of full feedback during training,

– lack of social contacts and group interaction during training,

– reduced motivation of students during online learning,

– the absence of such a decisive element in the learning process as imitation,

– technical errors that occur when using various distance learning systems,

– technical problems related to the operation of equipment,

– problems of digital inequality related to the fact that different students with different educational levels demonstrate different effectiveness in extracting information from digital sources and its practical application,

– lack of students' formed skills in organizing their own educational activities within the framework of flexible management of their time,

– insufficient psychological readiness for independent learning.

The accumulated data on the effectiveness and features of online learning during the fairly widespread use of distance learning technologies require a detailed analysis of the distance and the usual full-time learning method. Therefore, this work aims to compare the features of the application of the traditional teaching and distance education method in the conditions of rapid digitalization of all spheres of human activity.

Materials and methods of research

The objectives of the conducted research were: a) the study of the influence of interpersonal communications on the process and outcomes of higher education, b) the study of the influence of various digital and traditional learning technologies on student motivation and learning outcomes, c) the choice of the most effective technologies to ensure the desired result from educational activities. At the same time, the problems that arise for teaching staff during the transition to distance learning, associated with an increase in the teacher's word load and the need to master new technologies and new teaching methods, were not considered.

By the tasks set, a comparative analysis of various learning methods using distance learning technologies was used as a research method based on the synthesis of a large amount of data that was published after the start of the COVID-19 pandemic [8–13]. The

paper uses the results of studies that primarily use the materials of a mixed questionnaire (conducted in the form of a survey with the distribution of material in traditional form or as an electronic survey) [4, 8, 14, 15]. The results of the students' academic performance analysis, combined with a survey [5, 9], were also used. It should be noted that, despite the large number of studies on comparing various forms of education in individual educational institutions, only some works summarize the results of the conducted research. This is because the specifics of the training organization and assessment of knowledge for students of various specialties can vary greatly, which makes it difficult to quantify the influence of various factors on the nature of the formation of students' preferences, their satisfaction, and the result of mastering the educational program.

Research results and their discussion

In accordance with the purpose of this study, it is necessary to analyze both subjective assessments of students participating in the educational process and objective indicators that consider student academic performance. First, let's look at how students evaluate various elements of the educational process conducted in traditional or electronic form. As a result of a large-scale study of the academic activities of a large number of students in the Ural region conducted in 2020, it was shown that, at present, the form of realizing information available to students plays a significant role [8]. The content presented to students on electronic media was evaluated by students as less important than the content presented in traditional form (see Fig.1, the source of the questionnaire [8, p. 161]). Thus, the information received by students in electronic or traditional form from departments, specialized offices, and libraries was evaluated by students in importance in approximately the same way (Fig. 1). However, the information received in direct contact with the teacher and fellow students in traditional form during lectures, practical, laboratory classes, turns out to be more than two times more important than information via electronic media.

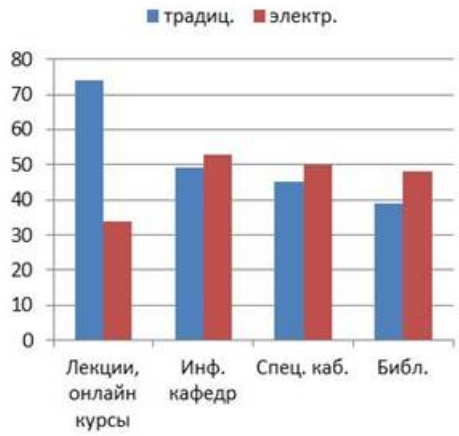

Fig. 1. The importance for students of educational materials on traditional and electronic media obtained from various sources (marked by students as "very important")

Other studies confirm the conclusions obtained above. Thus, a study covering students of 30 universities in the Russian Federation from the Central, Volga, Ural, Far Eastern, Southern, and Siberian districts showed that students easily master distance learning technologies, perceiving it as traditional learning transferred to digital format [3]. As a result of regression analysis, the possibility of social interaction and integration had the greatest influence on forming positive experiences among students during their studies. Students involved in interaction with teachers and other students experience greater satisfaction and positive experiences, leading to greater involvement in learning and

creating greater responsibility.

Similar conclusions can be drawn from an experimental study that examined students' assessment of lectures delivered by unfamiliar teachers in a traditional format in the classroom and the same lectures shown to students in a video [16, p.135]. As can be seen from Figure 2, the teachers' video lectures received lower student ratings in all parameters. The most significant difference in grades was obtained by the criterion of "interest," which is explained by the influence of the teacher's personality during the classroom lecture. However, a significant difference was demonstrated by the amount of information learned (the last column in Fig. 2). After the classroom lecture, students learned 1.4 times more information than after the video recording of the same lecture. This has been demonstrated in many studies confirming the following: all things being equal, the most informative and valuable are those lectures during which the lecturer establishes live contact with the audience, and the audience should be able to see the speaker's facial expressions, gestures, and emotional reaction [14, p. 101].

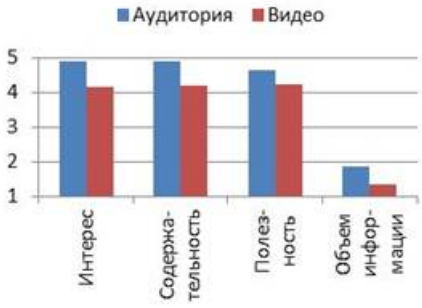

Fig. 2. Comparison of grades given by students to lectures delivered in traditional and video formats

Let's consider objective criteria for the effectiveness of various teaching methods, including the average score during certification and the number of students who successfully passed the subject. A study conducted at Orenburg State University compared the average score obtained by students during a session with traditional training (during the 2019/2020 academic year) and during distance learning (2020/2021 academic year) [17, p.130]. The average score obtained by students in exams did not change much during the transition from traditional to distance learning for both technical and humanities specialties. However, the proportion of students who successfully passed the session decreased in some groups (see Figure 3 for technical and Figure 4 for humanities). If for technical specialties, the share of successful students who passed the course both increased and significantly decreased (see Fig. 3, group 18STR/AD), then for humanities specialties, this share decreased in most groups (Fig.4). However, according to the students themselves, technical specialties cause great difficulties compared to humanities with distance learning [4, p. 111].

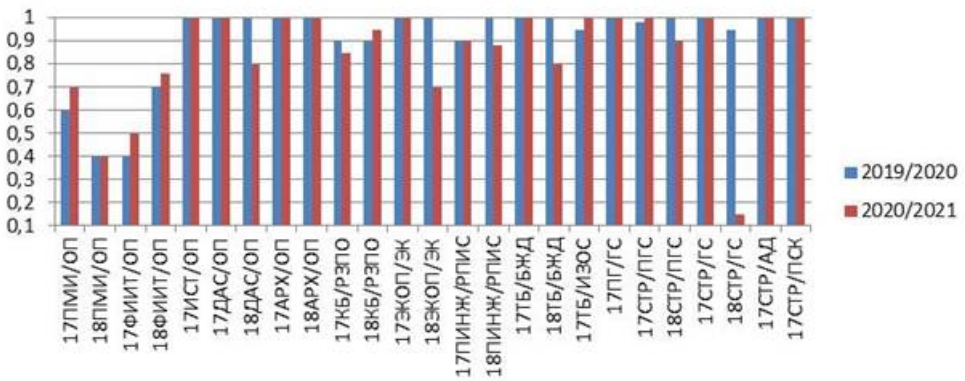

Fig. 3. The percentage of students who successfully passed the session (for technical specialties)

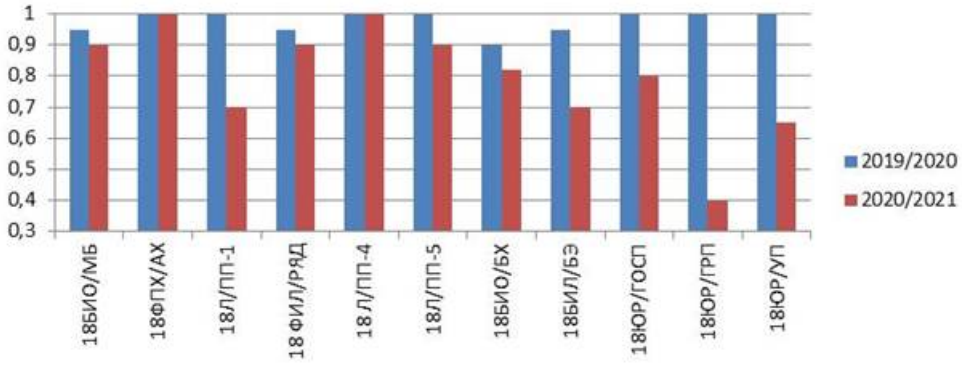

Fig. 4. The percentage of students who successfully passed the session (for humanities)

The studies reviewed were conducted for distance learning during the 2020/2021 pandemic; therefore, comparing traditional and distance learning results may only partially reflect the real picture, as for objective reasons, online and traditional exams were conducted in different conditions. However, when conducting certification in a standardized format, the differences between various types of training are significant, as shown in [9]. Students studying simultaneously with the same teacher in 2019 at the University of Eastern California assessed their professional skills before and after learning during the semester by answering questionnaire questions numbered in Figure 5 as Q1.1, Q1.2, Q1.3, Q1.4, and Q2. As shown in Fig. 5, students who chose traditional education evaluated their professional competencies significantly higher than students who chose distance learning. After completing their training during the semester, these grades, as expected, increased. However, the gap between the two forms of education remained: after studying in the traditional classroom, students gained more professional skills and abilities.

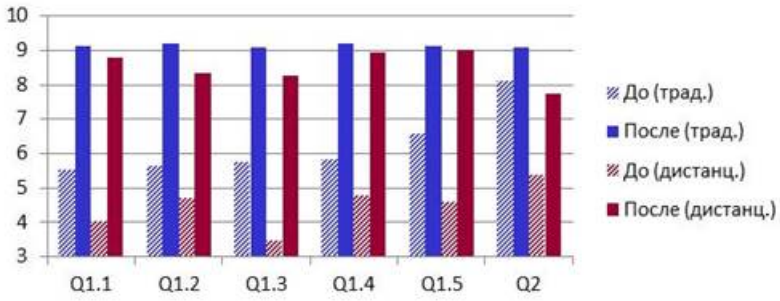

Fig. 5. Students' assessment of personal and professional skills before and after training in traditional and distance form

Here are the results of another comparison of the results of the final attestation of students obtained by the same students during the exam in mathematical analysis conducted in the traditional form in the winter session of the 2019/2020 academic year and during the final control work in remote form during the pandemic in the summer session of the 2019/2020 academic year [5]. The average score received by students for the exam in the traditional form, reduced to a five-point scale, is 2.0, while the average score of the same students for the summer session during the remote form is 4.2. Presumably, students received higher scores for remote work as a result of the fact that they could, despite the control, use the Internet. Therefore, for an adequate assessment and comparison of various forms of training, it is necessary to provide a standardized procedure for conducting final certification in the traditional and distance forms.

It should be noted that conducting exams remotely requires significant processing of exam assignments to exclude the possibility of simply using Internet calculators and an online bank of answers to questions on various topics. On the one hand, the commonality of assessment criteria should be maintained when conducting exams in any form while preserving the basic didactic principles of drawing up examination tasks, including a variety of functions to cover material on all topics, balance in terms of complexity, uniformity of tasks in individual sections [15].

On the other hand, when conducting a remote exam to prevent students from using Internet resources, careful work is required on the selection of both the questions and buildings them, as well as in formulating them, which should not make it possible to find a quick answer using quick copying but should make the studied material comprehensible. To do this, in the online exam, in addition to questions in the selection of answers, you can use the input of intermediate results of solving the problem in various templates and the input of step-by-step problem-solving. However, such preparation of tasks requires a lot of the teacher's time, and due to the high role of social interaction of students who collect information about all the tasks that exist, it is necessary to revise them every semester and show a creative approach [15, p. 26]. At the same time, the teacher must constantly improve both pedagogically and their level of computer technology proficiency.

In this regard, it should be noted that a modern teacher must possess high-level digital skills like searching and evaluating information on the Internet, independently creating educational materials and multimedia content, using existing educational resources, and creating virtual platforms for their student groups both based on the distance learning system used and on social networks, creating and distributing their digital portfolio, choosing modern methods, including mixed and mobile learning [18]. Mixed learning is a set of techniques and strategies that include three mandatory components: classroom, distance learning with a teacher, and mandatory independent work that a teacher must organize [19]. Blended learning has great potential for further development and can become one of the most common forms of learning [20, p. 97]. Mixed learning technologies are currently undergoing a stage of formation and simultaneous rapid development, which makes it difficult to timely assess their various aspects from the point of view of a scientific approach. However, from the typology of the twelve models of blended learning presented in [19, p.56], it is possible to identify models with high potential for further development. This is a mixed individual curriculum where the student chooses the number of subjects they need along with the form of study for each subject; a mixed academic subject, when various sections of the subject, as well as various stages of mastering (learning new material, consolidation, control, practical application), are studied by contact or remotely; online support with the organization of collective webinars and answers to questions; a mixed study that can be applied to undergraduates. Similar models or elements of blended learning are already being used in the training of students, which shows their undoubted attractiveness and prospects for improvement.

Conclusions

This paper compares the results of traditional and distance learning based on the analysis of quantitative and qualitative assessments of learning outcomes obtained during the training of students of higher educational institutions from various specialties. The following can be noted as a result of analyzing the learning outcomes obtained using various forms of learning. Currently, the highest results are achieved when using traditional

and mixed training. The traditional approach, carried out in the presence of direct contact between the teacher and students, provides a strong motivation to study due to direct interaction with the teaching staff and a comfortable perception of information both during lectures and during practical classes. The results of mastering theoretical information and practical skills when using traditional teaching are higher than when using distance learning, and students' subjective assessments of the convenience and comfort of learning are also higher for traditional teaching methods. At the same time, the traditional approach uses all modern digital technologies to provide better accessibility and visibility of the information received. Blended learning, which is undergoing rapid development at present, can be considered an evolution of traditional learning in the era of digitalization when some stages of learning can be more effectively organized in digital form and a distance format. Such stages and elements of training include the current control of knowledge, the development of practical skills in solving standard tasks, and the initial study of new material. At the same time, students' direct contact with the teacher and study group members is wholly preserved. Distance learning at this stage makes it possible to make education accessible to large groups of the population, which is one of the main advantages of this format. However, the results of mastering the educational material with remote learning show its lower effectiveness than the traditional and mixed approach.

Библиография

1. Лукашенко М. А., Громова Н. В., Ожгихина А. А. Цифровой имидж преподавателя предпринимательского университета // Высшее образование в России. 2021. Т. 30. №7. С. 91–104.
2. Шухман А. Е., Парфенов Д. И., Легашев Л. В., Гришина Л. С. Анализ и прогнозирование успеваемости обучающихся при использовании цифровой образовательной среды // Высшее образование в России. 2021. Т. 30. № 8-9. С. 125–133.
3. Панферов В. Н., Безгодова С. А., Васильева С. В., Иванов А. С., Микляева А. В. Эффективность обучения и академическая мотивация студентов в условиях онлайн-взаимодействия с преподавателем (на примере видеолекции) // Социальная психология и общество. 2020. Т. 11. № 1. С. 127–143.
4. Студеникина Л. И., Журавлева Е. В. Методические особенности составления экзаменационных тестов по математическим дисциплинам в период дистанционного обучения // Высшее образование сегодня. 2021. № 5. С. 24–29.
5. Остроглазова Н. А., Старостина Н. В. Лекция-презентация как инструмент внедрения инноваций в вузе // Высшее образование в России. 2021. Т. 30. № 6. С. 97–107.
6. Fuchs K., Karrila S. The perceived satisfaction with emergency remote teaching (ERT) amidst COVID-19: An exploratory case study in higher education. The Education and Science Journal. 2021. V. 23 (5). Pp. 116–130.
7. Gherhes,, V., Stoian, C.E., Farcasiu, M.A., Stanici, M. E-Learning vs. Face-To-Face Learning: Analyzing Students' Preferences and Behaviors // Sustainability 2021. V. 13. 4381. Pp. 1–15.
8. Al-Karaki J. N., Ababneh N., Hamid Y.,. Gawanmeh A. Evaluating the Effectiveness of Distance Learning in Higher Education during COVID-19 Global Crisis: UAE Educators' Perspectives // Contemporary educationa; technology. 2021. V. 13 (3). ep. 311, Pp. 1–16.
9. Abuhmaid A. M. The Efficiency of Online Learning Environment for Implementing Project-Based Learning: Students' Perceptions // International Journal of Higher Education 2020. V. 9. No. 5. Pp. 76–83.
10. Abney S. A Comparison of Traditional Classroom and Distance Education Classroom on Global Logistics and Group Settings // The Journal of Technology, Management, and Applied

Engineering 2020. V. 36. N. 4. Pp. 1–10.
11. Нархов Д. Ю., Нархова Е. Н., Шкурин Д. В. Динамика образовательной активности студенчества под воздействием цифровизации // Образование и наука. 2021. Т. 23, № 8. С. 147–188.
12. Ендовицкий Д. А., Рисин И. Е., Трещевский Ю .И., Руднев Е. А. Дистанционное обучение – дисбаланс возможностей и угроз // Высшее образование в России. 2022. Т. 1. № 1. С. 89–97.
13. Филатов В. В., Гобыш А. В. О роли дистанционного обучения в современном высшем образовании // Профессиональное образование в современном мире. 2020. Т. 10. №4. С. 4243–4251.
14. Дедюхин Д. Д., Баландин А. А., Попова Е. И. Дистанционное обучение в системе высшего образования: проблемы и перспективы // Мир науки. Педагогика и психология. 2020. №5. С. 1–11. https://mir-nauki.com/PDF/25PDMN520.pdf (доступ свободный). Загл. с экрана.
15. Старчикова И. Ю. Особенности дистанционного обучения в современных условиях российского вуза: по материалам опроса студентов // Перспективы науки и образования. 2021. № 2 (50). С. 103–117.
16. Казакова Е. И., Кондракова И. Э., Проект Ю.Л. Переход к экстренному дистанционному обучению в условиях пандемии в призме переживания студентами трансформации образовательной среды вуза // Образование и наука. 2021. Том 23. № 8. С. 111–146.
17. Козолупенко Д. П. Инверсия основных тенденций цифровизации в образовательном пространстве // Высшее образование в России. 2022. Т. 31. № 12. С. 115–129.
18. Заиченко Н. А. Цифровизация образования как триггер изменений образовательных отношений // Экономика и управление. 2020. Т. 26. № 11. С. 1157–1169.
19. Блинов В. И., Есенина Е. Ю., Сергеев И. С. Модели смешанного обучения: организационно-дидактическая типология // Высшее образование в России. 2021. Т. 30. № 5. С. 44–64.
20. Другова Е.А., Журавлёва И.И., Аюшеева М.Г. Трудности проектирования смешанного обучения в высшем образовании: опыт «Школ педагогического дизайна» // Высшее образование в России. 2023. Т. 32. № 6. С. 93–115.

Результаты процедуры рецензирования статьи

В связи с политикой двойного слепого рецензирования личность рецензента не раскрывается.
Со списком рецензентов издательства можно ознакомиться здесь.

На рецензирование представлена работа «Сравнительный анализ использования дистанционных и традиционных технологий обучения в высшей школе».
Предмет исследования. Работа посвящена проведению сравнения особенностей применения традиционного метода обучения и дистанционного образования в условиях стремительной цифровизации всех сфер человеческой деятельности. В работе представлены полученные результаты теоретического и эмпирического исследования. Автор выполнил поставленные задачи:
- изучено влияние межличностных коммуникаций на процесс и итоги обучения в высшей школе;
- исследовано влияние различных цифровых и традиционных технологий обучения на мотивацию студентов и результат обучения;
- выбраны наиболее эффективные технологии, обеспечивающие получение требуемого результата образовательной деятельности.

Поставленная цель была достигнута.

Методология исследования определяется актуальностью. Автором проведено теоретическое и эмпирическое исследование. В нем использован комплекс методов и методик, а также количественный и качественный анализ полученных результатов.

Актуальность исследования определяется тем, что важно решить имеющиеся трудности и проблемы применения дистанционных технологий при обучении студентов высших учебных заведений. В работе особое внимание уделено анализу традиционного метода обучения и дистанционного образования.

Научная новизна исследования. Проведенное исследование позволило:

- определены достоинства и недостатки, а также проблемы применения дистанционных технологий при обучении студентов высших учебных заведений;
- представлены подробные результаты проведенного исследования;
- выделены цифровые навыки, которыми важно овладеть современному преподавателю;
- описана технология смешанного обучения.

Стиль, структура, содержание. Стиль изложения соответствует публикациям такого уровня. Язык работы научный. Структура работы четко прослеживается, автором выделены основные смысловые части.

Во введении автор отметил актуальность затронутой проблемы. Было выделено, что цифровизация охватила все сферы человеческой деятельности, в том числе образование. Значительное влияние стало играть дистанционное обучение, на активное развитие которого повлияла пандемия COVID-19. Дистанционное обучение имеет определенные преимущества и достоинства, но также значительное количество недостатков. В то же время дигитализация и использование электронного контента в дистанционной форме обучения охватывает все аспекты системы обучения, что не достигается традиционной формой обучения. Дистанционное и традиционное очное обучение отличается трансформацией образовательных отношений, которые полностью или частично переносятся в виртуальное пространство, используются новые формы и возможности в этих отношениях. Автором выделены основные проблемы использования дистанционных технологий при обучении студентов высших учебных заведений. Проведенный анализ позволил выделить основное противоречие затронутой проблемы и цель работы. Однако важным является рассмотрение затронутой проблемы, поскольку наблюдается дефицитарность подобных исследований.

Следующие разделы посвящены описанию материалов и методов исследования. Автором выделены его задачи, методы и методики, а также основное содержание. Особое внимание в полученных результатах посвящено обсуждению следующих вопросов:

- важность для студентов учебных материалов на традиционных и электронных носителях, полученных из различных источников;
- сравнение оценок, данных студентами лекциям, прочитанным в традиционном и видеоформате;
- оценка студентами личных профессиональных навыков до и после обучения в традиционном и дистанционном виде и др.

Автором выделены цифровые навыки, которыми должен владеть современный преподаватель на высоком уровне: поиск и оценка информации в интернете, самостоятельное создание учебных материалов и мультимедийного контента, использование существующих учебных ресурсов; создание виртуальных площадок для своих студенческих групп, как на базе используемой системы дистанционного обучения, так и в социальных сетях; создание и распространение своего цифрового портфолио, выбор современных методов, включая смешанное и мобильное обучение.

Заключение содержит обоснованные и обобщающие выводы.

Библиография. Библиография статьи включает в себя 20 отечественных и зарубежных

источников, которые изданы за последние три года. В списке представлены, в основном, статьи и тезисы. Источники оформлены, в целом, корректно и однородно.

Апелляция к оппонентам.

Рекомендации:

- описать перспективы и основные направления дальнейшего исследования затронутой проблемы;
- выделить новизну и авторский вклад в решение выделенной проблемы;
- конкретизировать цель работы, поскольку в рамках данного исследования выделить особенности использования традиционного метода обучения и дистанционного образования в условиях стремительной цифровизации сложно во всех сфер человеческой деятельности.

Выводы. Проблематика статьи отличается несомненной актуальностью, теоретической и практической ценностью; будет интересна специалистам, которые занимаются проблемами использования дистанционных и традиционных технологий обучения в высшей школе. Статья может быть рекомендована к опубликованию с учетом выделенных рекомендаций.