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Digital Learning Environment in Training Future Kazakhstani English Teachers

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ABSTRACT

This research explores the integration of digital learning environments in the training of future English teachers in Kazakhstan. As the demand for innovative pedagogical strategies increases and technology becomes more prominent in education, it is important to examine how digital tools and platforms can improve the preparation of English teachers. Using a mixed-methods approach, including qualitative interviews and quantitative surveys, this study assesses the effectiveness of digital learning environments in Kazakhstani teacher training programs. The findings indicate that digital learning environments have the potential to enhance language proficiency, pedagogical skills, and technological fluency among teachers. However, there are also areas for improvement, such as addressing challenges related to access and integration of technology into the curriculum. This research explores the implementation of digital learning environments in the training of prospective English language teachers in Kazakhstan. It is essential to examine how digital tools and platforms can enhance the preparation of teachers for innovative teaching methods and the growing prominence of technology in education. Utilizing a mixed-method approach, including qualitative interviews and quantitative surveys, the study assesses the efficacy of digital learning environments within teacher training programs in Kazakhstan. It evaluates the advantages, challenges, and consequences of these digital learning spaces for future educators. Findings indicate that digital learning environments have the potential to improve language proficiency, teaching skills, and technological proficiency among teachers. Nevertheless, there are areas for improvement, such as addressing barriers to access and integrating technology into the curriculum more effectively.

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1. Introduction

Today, modern universities use various teaching methods in teaching, including lectures, practical classes or seminars, laboratory work, workshops, as well as independent student projects and student-led projects. Such learning formats as distance learning and mobile learning are being implemented in the educational process. In pedagogy, these methods facilitate strategies for managing the cognitive activity of future specialists to solve specific learning tasks [1]. The widespread use of digital technology in the educational process increases the effectiveness of training, as well as the professional skills and qualifications of future specialists. It is worth noting that these approaches help in retraining personnel and increasing their digital competence [2].

Digitalization in the field of education is undoubtedly aimed at improving the efficiency and quality of education at all levels and also contributes to achieving the goals of developmental learning through the use of smart technologies, modern online environments and platforms where a personal learning approach is applied [3]. Smart educational technologies involve the introduction of advanced digital tools as teaching materials in the educational process [4]. This updates the training materials and provides a personalized approach to learning, reducing the preparation time. These components play a crucial role in the modern realities of education, which is reflected in the economic, technological, and socio-cultural progress of the country and society [5].

The use of digital content allows us to constantly update and adapt modern methods to the changing needs in the global space. The use of smart platforms and digital educational resources gives education great advantages, optimizes the educational process, increases the motivation and involvement of students in learning the language as a subject, and also expands opportunities for independent learning of future English teachers [6]. In addition, the digital educational environment has a positive impact on students, develops them both culturally and intellectually, and improve critical thinking skills, which undoubtedly contributes to the improvement of the educational process.

Over the past decade, digital learning environments have revolutionized education by offering flexible, interactive and student-centered learning experiences. In Kazakhstan, in particular, the implementation of digital learning environments in the training of future specialists is aimed at improving domestic educational practice in line with global requirements and achievements in the field of digitalization. This study examines the effectiveness of digital educational platforms in the training of personnel, especially future English teachers, by analyzing the performance indicators of two Kazakhstani universities. The study used statistical research and examines the impact and effectiveness of the digital learning environment on various aspects of teaching English in universities.

2. Literature Review

In the last decade, there has been an increase in the volume of scientific and pedagogical research on the topic of digitalization of education in Kazakhstan. This is due to the entry into force of the state strategy “Digital Kazakhstan”, which determined the course of digitalization development in all spheres of activity in the country.

Kazakhstani researchers have studied the problems of informatization of education in various fields of pedagogy, including general and digital pedagogy, theory and methodology of teaching various subjects, as well as theory and methods of professional training of future personnel, thereby ensuring the development of their digital competencies.

It is worth highlighting the works of Nurgaliev G.K., Muldakhmetov Z.M., and Gazaliev A.M. [7] where the theory and practice of training specialists in the field of digital technologies and the use of digital tools in the training of technical specialists are considered in detail, which in turn defines the digitalization of education as a branch of science that studies the social consequences of computerization and digitalization, as well as pedagogical and psychological aspects of computer technology and determines the most effective approaches and methods of language learning, implementation and assimilation of information.

It is worth noting the work of such domestic scientists as Buzaubakova K.D., Amirova A.S., and Makovetskaya A.A., who studied the issue of digital pedagogy and its influence in the training of future specialists. Kazakhstan has published more than 200 scientific papers on the use and development of digital technologies in the field of education, including monographs, textbooks, research and review articles in highly rated journals.

However, there is a lack of professional training in pedagogical specialties and digital technologies among future specialists. The study of the scientific works of outstanding scientists who dealt with the issues of digitalization of education has revealed several scientific areas related to intelligent technologies in education. In the scientific and pedagogical research of Professor Baimukhanov B., such issues as the introduction of smart digital technologies into the educational process, as well as the development of new methods and approaches for using various kinds of software, the expanded use of digital technologies in the professional activities of teachers using statistical methods, as well as mathematical modeling are highlighted.

Methodical preparation of students for the use of smart technology in a digital environment, and teaching and training of digital specialists in various aspects of the theory and methodology of computer science are acute in the current competitive environment. This is due to the need for methodological training of future personnel to use digital platforms and tools, teaching computer science and training specialists in the field of computer science. It is important to develop the information culture of future teachers, providing them with methodological tools in media education at universities and effectively using the media in the educational process of the university[8].

This is due to the fact that nowadays there is a contradiction between the need to teach elements of computerization based on interdisciplinary connections, as well as the inefficiency of some textbooks and curricula in the educational process in the training of future specialists. Thus, the research is aimed at developing theoretical and methodological foundations for the training of future teachers of English and the specifics of various subjects, in which it is necessary to take into account the personal qualities of future teachers in the assessment and control of knowledge. This is reflected in the possibilities of using information technologies to assess and monitor students' knowledge in the educational process, which increases the demand for the development of new methods and approaches, as well as the introduction of these technologies into teaching, the introduction of smart digital platforms and educational environments in the learning process.

The formation of digital competence and information knowledge among teachers helps to solve many aspects and surveys: the policy and prospects for the development of human capital and resources in the state, the goal of digitalization of education, the system of formation of professional, digital and pragmatic competencies of teachers in connection with the development of smart digital technologies, as well as providing the material and technical base of universities[9].

At the same time, after studying the research works of scientists, it became clear that the use of the didactic capabilities of digital smart technologies for pedagogical purposes has a positive effect on the overall content of education, as well as contributes to the improvement of teaching methods and forms[10]. This creates great opportunities for individual and group approaches to learning and also facilitates the teacher's work by automating the process.

Digital learning environments have great potential to improve learning efficiency through the use of various advanced technologies such as virtual classrooms, multimedia resources and interactive platforms[11]. These technologies can significantly improve language acquisition, engagement, and teaching skills, research has shown. Nevertheless, the introduction of digital educational environments is fraught with some difficulties, such as requirements for technological infrastructure and resistance to change. To eliminate these difficulties, efforts are being made to provide educational institutions with the latest devices and equipment, as well as modern laptops and computers[12].

Comprehensive work to improve the teaching of the use and implementation of digital technologies is bearing fruit in the form of the formation of pragmatic and digital competencies, as well as the information culture of students. Nowadays, digital environments can be divided into several types: virtual classrooms, learning management systems (LMS), educational games and applications, and multimedia resources[13].

Virtual classrooms include platforms such as Zoom, Microsoft Teams and Google Meet, which provide commu-

nication and collaboration between teachers and students in real-time [14], making learning more effective. Learning Management Systems (LMS) serve as centralized platforms for storing course materials, assignments, and grades, creating a more structured and organized learning environment. These include platforms such as Moodle, Blackboard and Canvas. Educational applications and games, for example, offer effective approaches such as games that promote learning a foreign language [15].

Multimedia resources include videos, podcasts and simulators that improve language learning. It should be borne in mind that the information environment consists of a combination of software, hardware, information and communication networks and organizational and methodological elements of applied information systems of higher education [16]. These components are used by users of different interests and whose goals may also differ, and in general, effectiveness in improving the quality of life depends on the correct application of smart technologies.

Analyzing the above, it has become necessary to introduce the curriculum of teachers of such courses as "Digital Technologies in Teaching Foreign Languages", "Open Educational Resources", "Modern Digital Technologies in An Open Educational Space", "Theory and Practice of Distance Learning" and "Methods of Teaching Foreign Languages", which led to updating the content of education by the requirements in the field of science and education.

3. Methodology

3.1. Research Design

The study was conducted at the E.A. Buketov Karaganda University among students of 3–4 courses in the specialty "Foreign language: two foreign languages". As part of this study, surveys were conducted in various disciplines.

The survey identified several topics that needed to be repeated in the following disciplines: "Digital Technologies in Foreign Language Education", "Methods of Teaching Foreign Languages", "Open Educational Resources", "Modern Technologies in Modern Education", "Theory and Practice of Distance Learning", and "Computer Technology in Science and Education". These topics were identified during the 2022–2023 academic year and must be completed in order to obtain a bachelor's degree in education within four years.

The study used a quantitative approach using statistical analysis to assess the effectiveness of using digital smart technology in the training of English language teachers. The data were collected at Karaganda Buketova University among full-time and distance learning students. Participants were divided into control and experimental groups to assess the impact of the digital learning environment on their learning outcomes.

3.2. Participants

The sample consisted of 503 students enrolled in foreign language teaching programs. The participants were distributed as follows:

- full-time students 250
- distance learning students 255

The questions were selected for both full-time and distance learning, which made it possible to create a representative sample of future English teachers.

3.3. Data Collection

The data were collected through performance assessments and surveys. The study focused on three key areas: (1) motivational components, which include indicators of student motivation and engagement in the digital learning environment; (2) content components, which imply an assessment of the understanding and application of English-language content; and (3) organizational components, which implies an assessment of students' ability to implement digital tools into teaching practice.

The indicators were collected and analyzed using statistical tests to determine the effectiveness of smart technology and digital educational environments.

3.4. Statistical Analysis

The data were analyzed using descriptive statistics, Chi-squared and T-squared criteria. The descriptive statistics were used to summarize the data and provide a general idea of the effectiveness of each of the participants. The Chi-square criterion was used to study the differences between the control and experimental groups in terms of motivational, content and organizational components. The T-test was also used to compare averages between groups, in addition to

assessing statistical significance.

4. Results

4.1. Descriptive Statistics

In the course of the research, descriptive statistics were used to summarize the performance indicators of participants in two groups: control and experimental groups. As a result, the average scores for the following components were calculated and compared:

First, the motivational components, where the average score for the control group = 3.2 (SD = 0.8), the average score for the orientation group = 4.1 (SD = 0.7).

Secondly, content-based components, where the average score for the control group is 3.5 (SD = 0.9), the average score for the indicative group is 4.3 (SD = 0.6);

Thirdly, organizational components were taken, where the average score for the control group is 3.4 (SD = 0.8); the average the score for the reference group is 4.2 (SD = 0.7).

4.2. Chi-Square Test

In the study, in order to distribute the levels of academic performance between the control and experimental groups, a chi-square test was used for evaluation. First, motivational components were evaluated, where $\chi 2(2, N = 505) = 23.45$, $p < 0.01$.

Next, the content components were evaluated, where $\chi 2(2, N = 505) = 28.76$, $p < 0.01$.

The latter was evaluated by the organizational components, where it was found that $\chi 2(2, N = 505) = 21.34$, $p < 0.01$.

The results of the study showed differences between the control and experimental groups in all three components to a significant extent in **Figure 1**.

4.3. T-Criterion

Another type of comparison of the average indicators of the control and experimental groups was the t-criterion, which compared three components: The first is the motivational components, in which $t(503) = 9.45$, $p < 0.01$.

The second is the content components, where $t(503) = 10.22$, $p < 0.01$.

The third is the organizational components, where $t(503) = 8.94$, $p < 0.01$.

Analyzing the results of the t-test, one can see significant differences in all three evaluated components, the proof of which is the value where the experimental group scored more points than the control group. These results were illustrated in **Figure 2**.

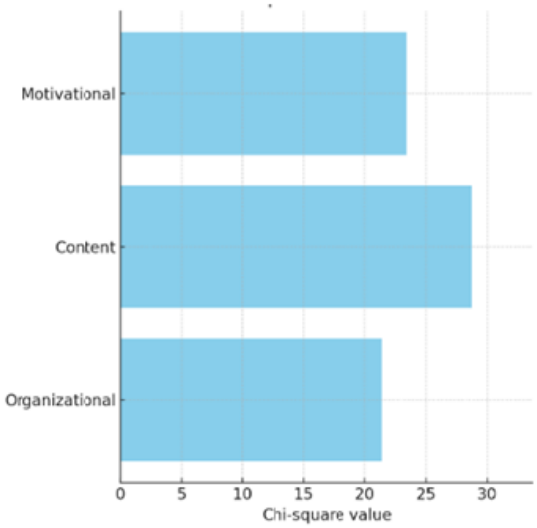

Figure 1. Chi-square test results.

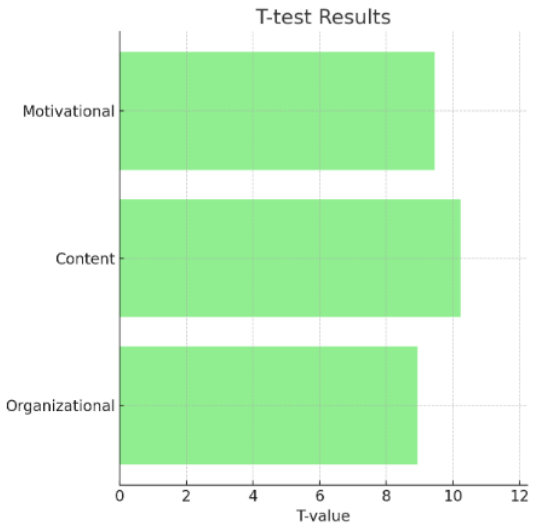

Figure 2. T-test results.

5. Discussion

Today's society is developing using digital technologies in many fields of activity. If we take the field of education, then this development has led to an increase in demand for digital educational platforms, as well as for the skills and

ability to use them by students of higher education.

The research conducted in this field provides a theoretical basis for research to substantiate the relevance of the implementation of smart technologies by future specialists in higher education. This aspect is important because it reflects the socio-economic changes in the country and society. Analyzing the research bases, it can be noted that there is a close and pronounced interdisciplinary connection in the field of digital technology application.

In order to achieve high results in the development of the courses taught, applications were implemented, with the help of which there were trends in the current education system through the use of smart technologies and digital environments. This has undoubtedly led to a significant increase in the number of applications of digital technologies, which will continue to play an important role in the higher education system in the future, as well as contribute to improving educational trends in Kazakhstan.

6. Recommendations

Smart technologies and digital environments will undoubtedly play an important role in the training of future personnel, as well as contribute to the expansion of computer technology in the field of higher education. The research that will be conducted in the future should eliminate various kinds of organizational issues associated with the digital research platform. They, in turn, can change the content of curricula and syllabuses, as these innovative changes using digital technologies will contribute to the development of teaching methods and approaches.

Smart technologies will undoubtedly become a universal tool in the training of future English teachers and specialties in other specialties.

They are able to meet the requirements of scientific and technological progress, including the use of smart technologies in the context of higher education. When conducting future research, it is necessary to take into account the limitations, as well as changes in the content of the curriculum if innovative changes are to be made in the methodology of foreign language education and teaching approaches.

7. Limitations

This study has a number of limitations. Firstly, it is intended exclusively for future English teachers and does not include those who currently work in this field. Secondly, it is specifically designed for future English teachers in Kazakhstan, which may limit the applicability of the results to English teachers in other contexts or countries.

Author Contributions

Conceptualization, S.A. and G.S.; methodology, A.G. and S.A.; validation, A.S.; formal analysis, G.T.; resources, G.S. and S.A.; data curation, A.G.; writing—original draft preparation, S.A.; writing—review and editing, G.T.; visualization, S.A.; supervision, G.S. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement

Not applicable.

Data Availability Statement

We are pleased to share our work and hope these resources facilitate further inquiry in the field. However, some data is unavailable due to privacy or ethical restrictions.

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Conflict of Interest

Authors declare no competing interest.

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