

*Alimova Sh.Zh.¹, Sheriyazdanova D.E.², Baigozhina Zh.M.³, Zhakienova A.A.⁴

^{1,2,4}Alkey Margulan Pavlodar Pedagogical University

³L.N. Gumilyov Eurasian National University

^{1,2,4}Kazakhstan, Pavlodar

³Kazakhstan, Astana

ORCID: <https://orcid.org/0000-0003-4254-1932>

ORCID: <https://orcid.org/0009-0003-0824-8721>

ORCID: <https://orcid.org/0000-0001-8832-2087>

ORCID: <https://orcid.org/0009-0003-1882-5174>

[*sholpan_alimova@mail.ru](mailto:sholpan_alimova@mail.ru)

A MOBILE APPLICATION DEVELOPMENT FOR STUDENTS: A CASE OF A PEDAGOGICAL UNIVERSITY

Abstract

Mobile learning has had a beneficial effect on contemporary educational trends and it has changed the way students engage with learning. The goal of the study is to describe the development process of a mobile application for students in order to improve their level of a foreign language proficiency and form the digital competencies. Various research methods were employed during this study, including theoretical analysis, literature and source reviews, assessments of mobile learning practices, content analysis, as well as a non-parametric statistical method such as the Mann-Whitney U-test and the use of SPSS Statistics software version 27.0. The empirical part of our research relied on the findings from testing and implementing the mobile application “Grammapp” created by authors. A total of 58 2nd year students, future English language teachers, from Alkey Margulan Pavlodar Pedagogical University participated in this research. The data collected were analyzed based on the midterm tests during 2024-2025 academic year. Consequently, students of the intervention group have shown greater receptiveness in improving the English language proficiency up to 17.2% and demonstrated competencies in mobile learning.

Keywords: digital tools, mobile application, mobile learning, digital competency, language learning, pedagogical university, interactivity.

Introduction. In the era of digital advances, technologies continue to transform the structure of education, offering innovative tools that help teachers and learners build their professional skills. Technologies are developing at a tremendous speed, which constantly influence the way the educational process is carried out. Technological devices can assist their users in the learning process and foster a competitive environment [1]. These devices provide a benefit as easy access regardless of time and place for all participants. Mobile learning allows students to use every opportunity to improve their skills. Mobile technologies provide students with enhanced convenience and flexibility [2].

Encouraging students about the advantages of mobile learning in higher education is essential [3]. One of these advantages is the fact that students can pursue their studies in spaces that cater to their specific requirements even outside the classroom [4]. Second benefit is that a mobile application also takes into account the psychological aspect of learning, since it helps to individualize the process in favor of learners and it enables personalization [5]. Third, students can choose the level of difficulty of tasks, material presentation and content, thereby giving them the opportunity to rely on their strengths and improve poorly developed processes as much as possible. Moreover, interactive learning, which mobile applications offer in the form of games and quizzes, makes the learning process more interesting. These functions support students' motivation, promote a deeper understanding and memorization of the material [6]. Mobile applications make it easy to track learning progress and get immediate feedback.

In the context of a modern trend in education, where the digital competency of a teacher plays a key role, the relevance of the study is determined by the need to form the digital competencies of future foreign language teachers. Mobile applications open up new opportunities for them in the educational process, such as increasing the effectiveness of learning by creating interactivity [7]. Digital skills enable learners to navigate effectively, utilize and interact with digital tools, technologies and resources to enhance language learning and communication. Digital skills of

students also include the ability to evaluate critically and select appropriate digital resources, adapt and personalize digital learning materials, promote active engagement and collaboration, and provide feedback in the process of foreign language learning [8]. In addition, these skills imply digital literacy, ethical responsibility and the ability to adapt to the ever-changing digital landscape [9]. Research in this area will help in preparing future foreign language teachers to form digital competencies efficiently and improve their level of the English language proficiency. Given the continuous nature of the language acquisition, the use of mobile technologies through ubiquitous devices provides a great opportunity to increase the depth and consistency of learning a foreign language.

Thus, the purpose of this study is to describe the development process of a mobile application for students in order to improve their level of a foreign language proficiency and form the digital competencies.

Methods and materials. In the process of the study, a variety of scientific methods were utilized, encompassing theoretical analysis, literature and source review, mobile learning practices, content analysis, as well as a non-parametric statistical method such as the Mann-Whitney U-test and the use of SPSS Statistics software version 27.0. The empirical segment of our research was based on the outcomes from testing and implementing the developed mobile application “Grammapp”. A total of 58 second-year students, future English language teachers, from Alkey Margulan Pavlodar Pedagogical University participated in this experiment. The students involved in the pedagogical experiment were split up into two groups: comparison and intervention, with 29 learners in each group. The pedagogical experiment took place during the academic year 2024-2025. In this article, we determined three research questions that are central to the study:

RQ1 – What is the primary level of English proficiency among students in both the intervention and comparison groups?

RQ2 – What changes occur in the language proficiency of students in the intervention group after utilizing the developed mobile application?

RQ3 – How effective is the newly developed mobile application “Grammapp” for the intervention group students?

Results and discussion. We analyzed mobile applications for English learning available on the AppStore and Play Market platforms and found out that the majority of these apps focus on various aspects: enhancing vocabulary (70%), teaching grammar (24%), and only a few that cover both areas (6%).

Applications that concentrate on grammar provide a comprehensive set of all grammar rules, but they do not categorize these rules by varying levels of difficulty. In these types of applications, the sections detailing the rules are frequently organized by principles in alphabetic order, which may not effectively support the learning process because certain grammar concepts are interrelated. During the study period, some information may overlap with another one, resulting in a lack of coherent sequence, causing all the material to be mixed up. Not all applications have a feedback section that will not allow students to take tests and assess their knowledge.

Vocabulary learning applications aim to enhance vocabulary by introducing new words, phrases and expressions. These apps feature engaging content, presented through colorful cards, games, and crosswords to make learning enjoyable. This technique enables learners to efficiently and swiftly expand their vocabulary and phrasal expressions. Some of these applications offer new words within the context of sentences and texts. Furthermore, there is a third category of apps that takes a holistic approach to learning and integrating both grammar and vocabulary elements.

Before the development of a mobile application, we conducted the pedagogical experiment to find out students' level of English. To assess the mid-term control indicators for the course “Practice of Oral and Written Speech” a language test was launched for both groups. The outcomes of assessing the English language proficiency of the comparison group students (n=29) and the intervention group students (n=29) at the initial stage of the experiment are shown in Figure 1.

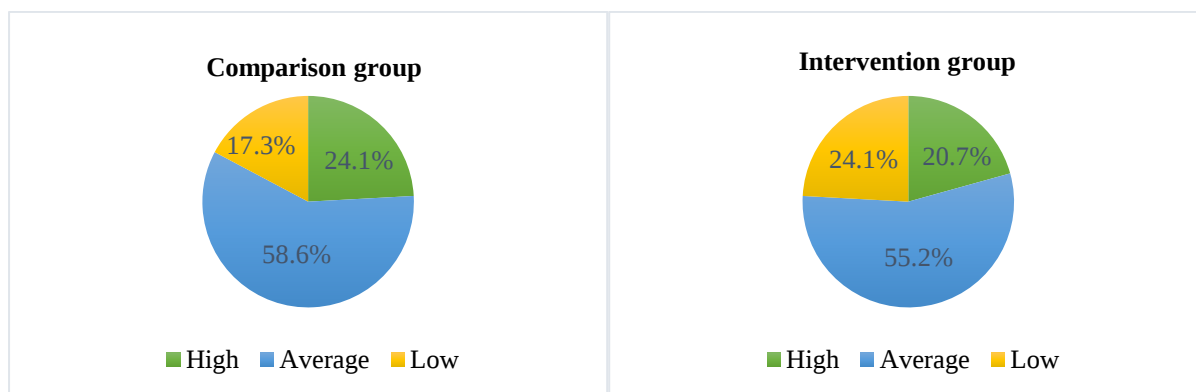


Figure 1. The outcomes of assessing students' English language proficiency

Source: created by the authors

The data reveal that students of the comparison group at the initial stage of pedagogical experiment have a high level of English – 24.1% (7 students), an average level – 58.6% (17 students) and a low level – 17.3% (5 students). The students of the intervention group demonstrated the English language proficiency in a high level – 20.7% (6 student), in an average level – 55.2% (16 students) and in a low level – 24.1% (7 students).

The application of statistical significance of the non-parametric Mann-Whitney U-test confirmed the findings of both comparison and intervention groups. There are no differences in key characteristics between two groups at the initial stage according to the formula (1), which was utilized for this calculation [10]:

$$U = n_1 \cdot n_2 + \frac{n_x \cdot (n_x + 1)}{2} - R_x \quad (1)$$

The total ranking for the intervention group is 816, for the comparison group is 894. We will count the largest sum by $R_x=894$.

The statistics enable the formulation of hypotheses:

H0: the intervention group does not perform better than the comparison group regarding the level of English language proficiency.

H1: the intervention group performs better than the comparison group regarding the level of English language proficiency.

By calculating the value U_{emp} with suggested formula (2), we receive:

$$U_{emp} = 381 \quad (2)$$

So, $U_{crit} = p \leq 0.01 - 270$, $p \leq 0.05 - 314$, consequently, the statistics indicate samples of insignificant differences, supporting the null hypothesis (H0) that confirms these groups are consistent at the initial stage.

Based on the received information, the final choice was made to focus on grammar utilizing feedback for students. The Adalo platform was selected for the development of the mobile application "Grammapp" [11]. The application's first page includes a greeting, a logo, a title of the app, along the "Start" button that leads to subsequent window. The "List" window was chosen next, allowing users to scroll through conveniently and find a relevant topic. The "List" contains various grammar rules of the English language. Each button has its own name, function and is responsible for a specific grammar rule. By clicking on any of these buttons, learners will access a new screen that presents an explanation of the rule along with examples. We included an additional "Remember" section that highlights crucial information regarding the use the grammar structure. Moreover, every screen, except for the first page, incorporates the "Back" button that enables students to return easily to the previous page. Figure 2 illustrates a prototype screen of the "Grammapp" application.

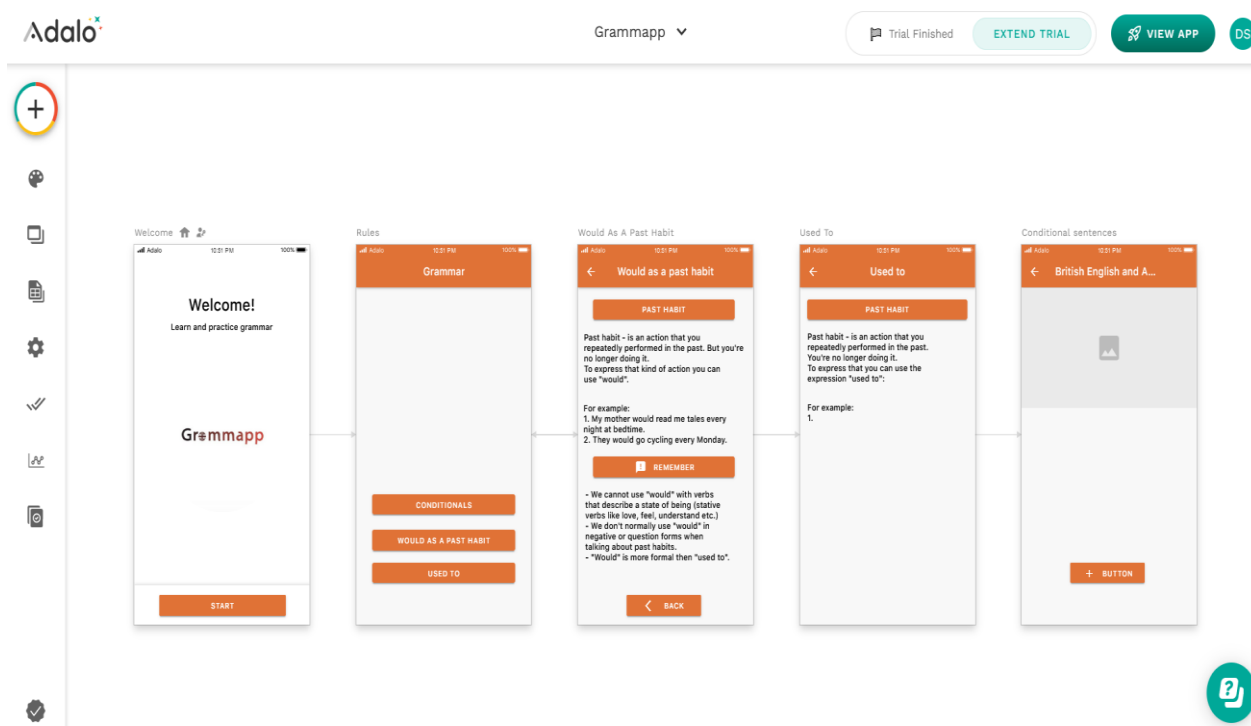


Figure 2. A prototype screen of the “Grammapp” application

Source: created by the authors

Along with developing the application, the main issue was to think through the content of the material. Since our study targets future English teachers, specifically 2nd-year students enrolled in the “Foreign language: two foreign languages” educational program, it is important to note that these students mostly know English at the Intermediate (B1) or Upper-Intermediate (B2) levels. According to the syllabus, at this level of language proficiency, learners study “Modal verbs for invitations, requests, offers and permissions”, “Conditionals”, “Passive voice”, “Reported speech”, “Relative clauses”. This entails the necessity of incorporating grammar structures that align with the rules they have studied. Once the content was determined, the process of finalizing the application began. This involved the tasks of designing windows, inserting text fields, and adding images to increase visual comprehension. The starter version of the mobile application “Grammapp” is presented in Figure 3.

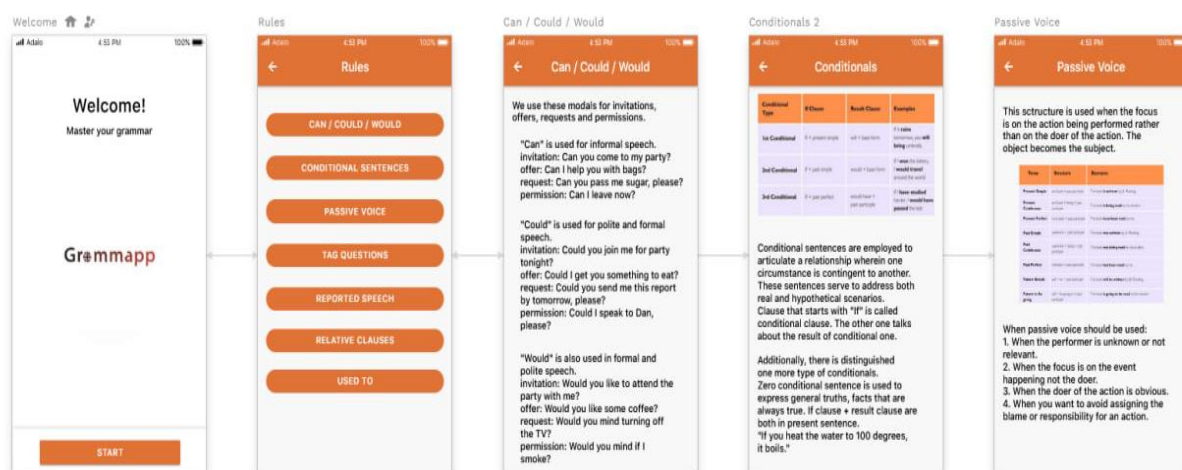


Figure 3. Starter version of the mobile application “Grammapp”

Source – created by the authors

Mobile application was tested with second-year undergraduate students during 2024-2025 academic year. The students were chosen as participants in the pedagogical experiment for several reasons: (1) undergraduate students generally adapt more readily to new technologies and digital advancements; (2) 1st and 2nd-year students are typically more engaged in attending classes and eager to participate actively in the study; (3) since the participants were all enrolled in the same educational program and course of study, they presumably possess a comparable level of foreign language proficiency. Prior to working with this application, we assessed the initial English proficiency of the participants of the intervention and comparison groups. Then subsequently introduced “Grammapp” application to the intervention group students for further engagement.

After the initial stage of using the mobile application, students noted the ease of finding information as well as the absence of registration stage. They reviewed the material presented on the screen, revising the topics. The intervention group students emphasized the completeness of the content, the minimalist design and the absence of the redundant information. The material is relevant, presented in a clear language, and aligns with the curriculum. Throughout their use of the application, no technical issues emerged that required prevention or resolution.

Having studied the preliminary level of digital competency and testing the participants on grammar structures, the intervention group proceeded with testing the application. Despite the fact that we previously described that the application received positive comments from the first use, due its key points, then it became evident that the mobile application needs improvements, specifically, the addition of a defining feature. Since “Grammapp” was created not only as a grammar study tool but also to assist in developing digital competencies. Screenshots of the passive voice section of the “Grammapp” application show one of its new features, called “Learn more”. This button can be used by learners to follow two links to public websites, one of which allows participants to enrich their subject knowledge, while the second link sends them to quizzes (Figure 4).

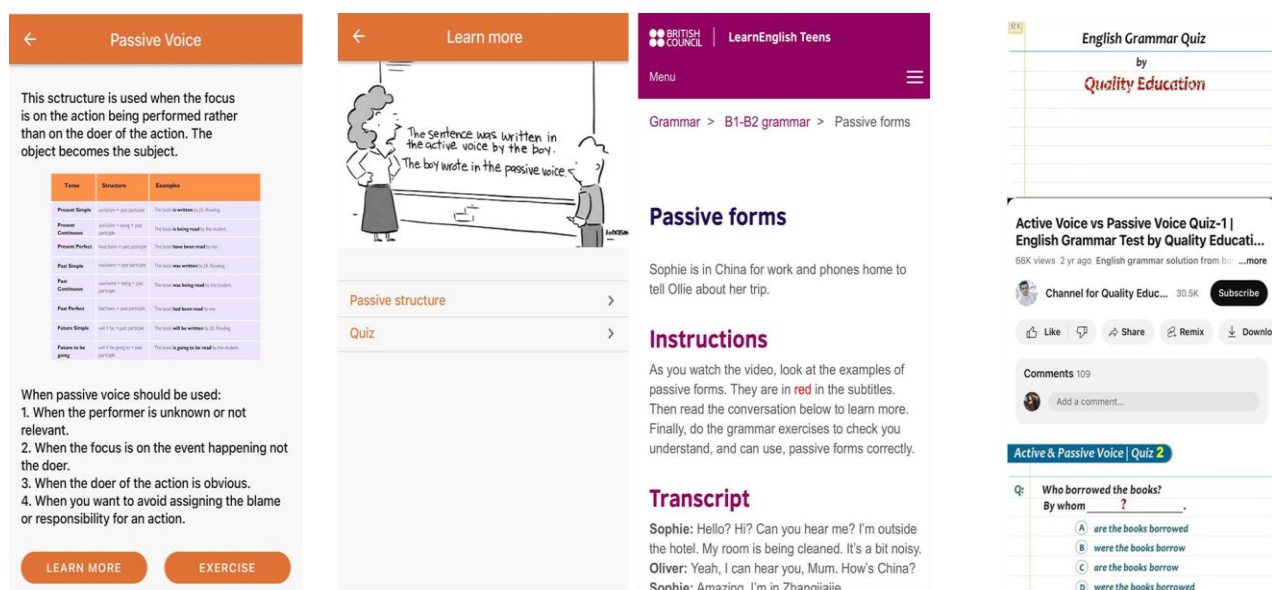


Figure 4. “Learn more” function in the “Grammapp” application

Source: created by the authors

An alternative option was to add the Exercise section to the application, which allows users to complete test assignments that reinforce the studied material. Students of the intervention group positively accepted the innovations, especially the interactivity of the application, the ability to follow links and deepen their knowledge. It was noted that the application had changed slightly, previously identified shortcomings were taken into account, and the appearance of more material content had an excellent effect on its use.

The data in the table demonstrate several shifts in the language proficiency of students in the intervention group after utilizing the mobile application “Grammapp”. The comparison group also saw positive developments, primarily at an average level. The applying of the non-parametric Mann-Whitney U-test indicated that measurable changes occurred in the intervention group at the language level. A comparative table for assessing the language levels of both comparison and intervention groups at the initial and final stages of the pedagogical experiment (Table 1).

Table 1. Comparative table for assessing the language level of the CG and IG at the initial and final stages of the experiment

Stage	Comparison group			Intervention group		
	levels in %					
	high	average	low	high	average	low
Initial	24.1%	58.6%	17.3%	20.7%	55.2%	24.1%
Final	31%	55.2%	13.8%	37.9%	44.8%	17.3%
Comparison	+6.9%	- 3.4%	- 3.5%	+17.2%	- 10.4%	- 6.8%

Source: created by the authors

In addressing to the first research question of our study: “What is the primary level of English proficiency among students in both the intervention and comparison groups?”, the evaluation of hypothesis H0 through non-parametric Mann-Whitney U-test indicates that the intervention group students do not surpass the comparison group students regarding the language proficiency. During the initial stage of the experiment, both groups demonstrated homogeneity. In response to the second research question: “What changes occur in the language proficiency of students in the intervention group after utilizing the developed mobile application?”, it was revealed that following the use of the mobile application created by the authors, the high language proficiency level in the comparison group rose from 24.1% up to 31%, which means an increase of 6.9%. Conversely, the high language proficiency level in the intervention group surged by 17.2%, growing from 20.7% to 37.9%. Answering the third research question: “How effective is the newly developed mobile application “Grammapp” for the intervention group students?”, our findings indicate that mobile learning positively influences not just the level of English language proficiency, but also the enhancement of digital competencies. These competencies include the ability to use digital tools, so intervention group students started using a newly developed mobile application “Grammapp”. Then students were able to navigate between windows as well as to work with supplementary resources integrated within the mobile application. Learner also could individualize the material by selecting the level of English for studying grammar. Moreover, students in the intervention group showed increased independence, the ability to seek not only relevant information but also additional resources, and began providing more feedback.

Although our study yielded positive outcomes, various limitations should be taken into account when interpreting the data and planning future studies. The pedagogical experiment was carried out solely with second-year students from one educational program, which limits the generalization of the results. To improve the credibility of the findings, subsequent studies should be included to expand the sample by incorporating learners from different educational programs. Thus, we have come to the stage of summing up the experiment for our study. Based on the obtained indicators, it should be considered that the main goal of the experiment was successfully achieved. Participants showed a sign of the development of digital competencies, along with the improvement of their knowledge in the field of grammar.

Conclusion. In our study a number of popular mobile applications for learning English were analyzed, which allowed us to find out the areas of digital competencies. This article describes in details the process of developing a mobile application on a specialized website without the need to write code, revealing all the pros and cons of this process. After development, the application was subjected to the procedure of implementation in the process of conducting an experiment. The pedagogical experiment was aimed at second-year students, future English teachers and included

several stages: testing, approbation of the application, testing. Based on the information received, a prototype version of the mobile application was developed, which was called “Grammapp” and during its use some improvements were made. The last stage of the experiment was grammar testing, according to similar principles as in the initial stage. The results of the language test showed that the intervention group students who studied using the mobile application improved their foreign language proficiency up to 17.2% as well as their digital skills.

The recommendation following the development of the mobile application at a pedagogical university is to include additional grammar rules and supplementary materials that enhance students’ proficiency in a foreign language and their digital competencies as well. It is also important to increase the range of educational disciplines, where this application can be used. So, mobile applications offer an access to current information, enabling users to practice a foreign language with interactive exercises and multimedia content.

REFERENCES

- 1 Kar, A.K. & Kushwaha, A.K. (2021). Facilitators and barriers of artificial intelligence adoption in business – insights from opinions using big data analytics. *Information Systems Frontiers*, 25, 1351-1374. DOI: <https://doi.org/10.1007/s10796-021-10219-4>
- 2 Juraev, T.N. (2023). The use of mobile learning applications in higher education institutes. *Advances in Mobile Learning Educational Research*, 3(1), 610-620. DOI: <https://doi.org/10.25082/AMLER.2023.01.010>
- 3 Lavidas, K., Petropoulou, A., Papadakis, S., Apostolou, Z., Komis, V., Jimoyiannis, A., & Gialamas, V. (2022). Factors affecting response rates of the Web survey with teachers. *Computers*, 11(9), 1-15. DOI: <https://doi.org/10.3390/computers11090127>
- 4 Chaldi, D. & Mantzanidou G. (2021). Education robotics and STEAM in early childhood education. *Advances in Mobile Learning Educational Research*, 1(2), 72-81. DOI: <https://doi.org/10.25082/AMLER.2021.02.003>
- 5 Alfalah, A.A. (2023). Factors influencing students’ adoption and use of mobile learning management system (m-LMSs): A quantitative study of Saudi Arabia. *International Journal of Information Management Data Insights*, 3(1), 1-8. DOI: <https://doi.org/10.1016/j.jjime.2022.100143>
- 6 Criollo-C, S., Guerrero-Arias, A., Jaramillo-Alcazar, A. & Lujan-Mora, S. (2021). Mobile learning technologies for education: Benefits and pending issues. *Applied Sciences*, 11(9), 1-17. DOI: <https://doi.org/10.3390/app11094111>
- 7 Anthony, B., Kamaludin, A. & Romli, A. (2023). Predicting academic staff behaviour intention and actual use of blended learning in higher education: Model development and validation. *Technology, Knowledge and Learning*, 28, 1223-1269. DOI: <https://doi.org/10.1007/s10758-021-09579-2>
- 8 Nicolaidou, I., Pissas, P. & Boglou, D. (2021). Comparing immersive Virtual Reality to mobile applications in foreign language learning in higher education: a quasi-experiment. *Interactive Learning Environments*, 31(4), 2001-2015. DOI: <https://doi.org/10.1080/10494820.2020.1870504>
- 9 Hinze, A., Vanderschantz, N., Timpany, C., Cunningham, S.J., Saravani, S.J. & Wilkinson, C. (2023). A study of mobile app use for teaching and research in higher education. *Technology, Knowledge and Learning*, 28, 1271-1299. DOI: <https://doi.org/10.1007/s10758-022-09599-6>
- 10 Oti, E.U., Olusola, M.O., & Esemokumo, P.A. (2021). Statistical analysis of the Median test and the Mann-Whitney U test. *International Journal of Advanced Academic Research*, 9(7), 44-51. [Electronic resource]. – URL: <https://www.ijaar.org/statistical-analysis-of-the-median-test-and-the-mann-whitney-u-test/>
- 11 Mobile and web application builder. [Electronic resource]. – URL: <https://previewer.adalo.com/24bf2a90-7a26-4bd7-9f27-6687332fa82b>

*Алимова Ш.Ж.¹, Шериязданова Д.Е.², Байгожина Ж.М.³, Жакиенова А.А.⁴

^{1,2,4}Әлкей Марғұлан атындағы Павлодар педагогикалық университеті

³Л.Н. Гумилев атындағы Еуразия ұлттық университеті

^{1,2,4}Қазақстан, Павлодар

³Қазақстан, Астана

СТУДЕНТТЕР ҮШІН МОБИЛЬДІ ҚОСЫМША ӘЗІРЛЕУ: ПЕДАГОГИКАЛЫҚ УНИВЕРСИТЕТТІҢ ТӘЖІРИБЕСІ

Аңдатпа

Мобильді оқыту заманауи білім беру үрдістеріне оң әсер етіп, студенттердің оқуға деген көзқарасын өзгертеді. Зерттеудің мақсаты – студенттердің шет тілін меңгеру деңгейін арттыру және олардың цифрлық құзыреттілігін қалыптастыру үшін мобильді қосымшаны әзірлеу процесін сипаттау. Жұмыс барысында теориялық талдау, әдебиеттерге шолу, мобильді оқытуды пайдалану тәжірибесі, контент-талдау, сонымен қатар параметрлік емес статистикалық әдіс Mann-Whitney U-test және SPSS Statistics бағдарламалық қамтамасыз ету 27.0 нұсқасын қамтитын әртүрлі зерттеу әдістері қолданылды. Зерттеуіміздің эмпирикалық бөлігі автордың “Grammap” мобильді қосымшасын сынау және енгізу нәтижелеріне негізделді. Зерттеуге Әлкей Марғұлан атындағы Павлодар педагогикалық университетінің болашақ ағылшын тілі пәнінің мұғалімдері, 2 курстың 58 студенті қатысты. Жиналған деректер 2024-2025 оқу жылындағы аралық бақылау нәтижелері бойынша талданған. Зерттеу нәтижесінде эксперименттік топ оқушыларының ағылшын тілін меңгеру деңгейі 17.2%-ке артып, студенттер мобильді оқу құзыреттіліктерін де көрсетті.

Түйінді сөздер: цифрлық құралдар, мобильді қосымша, мобильді оқыту, цифрлық құзыреттілік, тіл үйрену, педагогикалық университеті, интерактивтілік.

*Алимова Ш.Ж.¹, Шериязданова Д.Е.², Байгожина Ж.М.³, Жакиенова А.А.⁴

^{1,2,4}Павлодарский педагогический университет имени Әлкей Марғұлан

³Бразильский национальный университет имени Л.Н. Гумилёва

^{1,2,4}Казахстан, Павлодар

³Казахстан, Астана

РАЗРАБОТКА МОБИЛЬНОГО ПРИЛОЖЕНИЯ ДЛЯ СТУДЕНТОВ: ОПЫТ ПЕДАГОГИЧЕСКОГО ВУЗА

Аннотация

Мобильное обучение оказывает положительное влияние на современные образовательные тенденции и меняет отношение студентов к обучению. Целью исследования является описание процесса разработки мобильного приложения для повышения уровня владения иностранным языком и формирования цифровой компетенции студентов. В ходе работы были использованы различные методы исследования, включая теоретический анализ, обзоры литературы, опыт применения мобильного обучения, контент-анализ, а также непараметрический статистический метод U-критерий Манна-Уитни и программное обеспечение SPSS Statistics версии 27.0. Эмпирическая часть нашего исследования опиралась на результаты тестирования и внедрения авторского мобильного приложения “Grammap”. Всего в исследовании приняли участие 58 студентов 2 курса, будущие учителя английского языка Павлодарского педагогического университета имени Әлкей Марғұлан. Собранные данные были проанализированы на основе результатов рубежных контролей в течение 2024-2025 учебного года. В результате исследования отмечено, что у студентов экспериментальной группы уровень владения английским языком увеличился на 17.2%, а также студенты продемонстрировали компетенции в мобильном обучении.

Ключевые слова: цифровые инструменты, мобильное приложение, мобильное обучение, цифровая компетенция, языковое обучение, педагогический университет, интерактивность.

Received: 10.06.2025

Approved after peer review: 22.07.2025

Accepted for publication: 26.09.2025