

The Role of Mobile Applications in a Foreign Language Learning

ALLA LATYGINA, IRYNA ZVARYCH, NATALIYA LATYGINA, OLHA DUBININA,
LIUBOV KOLOT, YULIYA YUVKOVETSKA
Department of Foreign Philology and Translation,
Faculty of Trade and Marketing,
Kyiv National University of Trade and Economics,
19, Kyoto Str., Kyiv, 02156
UKRAINE

Abstract: - In the era of digitization, the traditional teaching method is not a sufficiently effective tool in increasing the level of information acquisition. One method to improve the educational program can be the introduction of a variety of content, technological or not, which occupies a noteworthy place in enhancing learning effectiveness. The purpose of the study was to determine the impact of using mobile applications on the success of students in learning a foreign language. To achieve the goal, the comparative method, testing, surveys, and statistical methods of analysis were used. The results showed a statistically significant difference in the vocabulary of the students of the experimental group when comparing the results before and after the study. EG student engagement, attention focus, and immersion in educational programs using mobile applications received relatively high marks. The study provides preliminary empirically supported results that indicate that mobile applications can be attractive and highly effective in foreign language learning. The practical value of the study is that the results demonstrate that teachers can benefit from the fact that students will use mobile applications to enhance their vocabulary performance when learning a new language. By general recognition, mobile applications are exceptionally convenient to use, and students demonstrate better results in learning as compared to students who took a course according to a traditional program. A promising research perspective can be the use of artificial intelligence for learning a foreign language in institutions of higher education.

Key-Words: - Foreign language, mobile applications, digitalization of education, digitalization era, vocabulary, grammar.

Received: April 21, 2023. Revised: November 18, 2023. Accepted: December 18, 2023. Published: January 23, 2024.

1 Introduction

An urgent issue is the need to choose and apply the same teaching methods that will allow students to acquire the necessary knowledge and skills when learning foreign languages and ensure a high level of assimilation of the material, as well as the opportunity to use it in practice, [1], [2]. Drawing on the above, the methodology of teaching foreign languages needs to be updated, namely, the involvement of modern technologies and various methods in order to develop students' speech and communication skills grounded on basic competencies.

Scholars supporting current initiatives still perceive digital literacy skills as a development that "should be an integral part of the educational program of preparation before and during work", [3], and should also already meet the requirements of future employers. But it is expedient to move further, in the course of university education to

engage students in self-education throughout their lives. This requires continuous improvement, taking into account student feedback. Furthermore, digital literacy will tend to gain its relevance at the same rate as technological advances.

The researchers noted that the assimilation of the studied material with the help of digital technologies is connected precisely with the spread of mobile means of communication, the increase in the number of educational applications that provide opportunities, and also improve the educational process' quality, [4]. In practice, mobile applications have quite a big advantage in contrast to traditional teaching methods, such as enhancing educators' cognitive activity, intensification of independent activity, motivation for learning, individualization of learning, and the ability to provide feedback. Many mobile applications have become effective learning tools when mastering a foreign language. Given the above, the purpose of the article was to investigate in more detail the role

of mobile applications for learning a foreign language in higher education institutions.

To address the above purpose, several tasks have been set:

1. To analyze modern mobile applications for learning a foreign language and choose the most suitable to be implemented in the educational process;
2. To develop an educational program using mobile applications during lectures;
3. To analyze students' level of foreign language proficiency before starting the experiment
4. To compare groups of students to determine the effectiveness of the implemented mobile applications.

2 Literary Review

The globalized world encourages its citizens to establish intercultural interaction with representatives of other countries. With that in mind, learning a foreign language has a special place in the educational system of countries. Command of the English language at a high level is an indispensable condition for graduates to have the opportunity to contribute to international scholars' scientific inquiry.

Several foreign researchers also share this view. In this regard, a foreign language is no longer an end and can also oftentimes serve as a professional language for lectures and academic engagement. Moreover, the English language is increasingly becoming a necessary tool in everyday activities as well as the professional work of scientists. Competitive professionals of the future need to master all ways of communicating with foreign colleagues, [5].

Still, other scholars have identified the integration of mobile applications into the educational environment for various educational areas. For example, in his work, [6], was conducted research using a specialized mobile application for Android. The researcher decided to implement m-learning in a distance learning format to determine the application effectiveness in improving access to relevant educational resources, as well as for instant messaging between students and teachers during seminars. Was determined how the integration of mobile applications will affect the development of fitness during physical education lessons, [7]. Was conducted a study, [8], to determine not only the analysis of educational outcomes but also the analysis of students' opinions about the study of chemistry using different applications. Therefore, it can be concluded that the introduction of mobile

applications to the educational program can enhance educators' success.

The literature analysis shows the relevance of using mobile applications in education, so it was decided to probe deeper into the impact of mobile applications on students' engagement in learning a foreign language. Many scientists hold that the implementation of mobile applications in education is an effective tool for tackling complex educational programs. For instance, researchers, [9] and [10], experimented to determine the effect of mobile applications on enhancing foreign vocabulary. In study, [11], was tested mobile applications' influence on learning vocabulary and grammar of a foreign language. However, the choice of mobile applications did not take into consideration students' personal needs.

The paper, [12], determined the impact of integrating mobile applications in the study of business English. With that in mind, the authors developed learning strategies and also suggested ideas on how they can be implemented in the educational process. Other researchers maintain that m-learning should be integrated into the traditional system of learning a foreign language, [13], [14]. Indeed, contemporary students have become active users of smartphones and various mobile applications, which have become effective tools for quick searches for the necessary information.

However, the issue of effective integration of mobile applications and the educational process, namely for learning a foreign language, has not been addressed:

- due to the large selection of mobile applications for determining a foreign language, it isn't easy to decide which mobile application will contribute to the achievement of educational goals, as well as educators' needs;

- how to introduce a mobile application into the educational process so that students' attention is focused on its didactic potential and not on the entertainment one;

- how to organize an independent review of work, determination of compliance of material complexity level with the curriculum, taking into account the individual characteristics and considering students' wishes;

- how to preserve the teacher's role in knowledge transfer and students' professional development.

Therefore, we can conclude that the new realities of the digital society require the optimization of language education. The modern world places a significant place on mobile applications due to their unique possibilities of transmitting, searching, and

processing information. Modern globalized challenges related to COVID-19, the military invasion in Ukraine, and the transition to remote work indicate their importance in various spheres of life and diverse fields of activity, including the goals of foreign language acquisition, and intercultural communication.

Given the above, several scholars share the opinion that the introduction of m-learning into the practice of teaching a foreign language contributes to the activation of foreign language communication, individualization of intensification, and differentiation of learning, [15]. However, according to [16], mobile applications, like any other medium, have their advantages and drawbacks. The teacher's task is to ensure an

appropriate optimization and integration of mobile applications into the educational process and foreign language communication. Hence, there arises a need for further study into the didactic potential of mobile applications in the context of globalization and the elaboration of remote interaction forms.

3 Materials and Methods

3.1 Research Procedure

The research procedure was as follows (Table 1). The educational program for learning a foreign language was elaborated during the experiment (Table 2).

Table 1. Stages of the experimental part of the study

Stage	Period	Description
Preparatory	September 2022	1. Analysis of the traditional approach to foreign language learning at higher education institutions. 2. Selection of relevant mobile applications to be implemented in the educational process. 3. Selection of students for the experimental part through preliminary testing. 4. Division of students into homogeneous groups according to their level of English language proficiency.
Experimental	October-December 2022	Introduction of mobile applications in the experimental group during the educational process.
Stating	December 2022	1. Conducting a general test to determine students' lexical skills after the introduction of mobile applications, as well as the quality of vocabulary. 2. Conducting a conversation to determine students' lexical and speaking skills.
Final	January 2023	1. Analysis of the obtained results. 2. Statistical processing of results. 3. Preparation of conclusions.

Table 2. The structure of the curriculum for the 1st semester in the subject "Foreign (English) professional language"

No.	Topic	Q-ty of hours	Mobile applications used
1	Company structure. Activity and its indicators. (Key positions in large companies (Common job titles). Description of positions and major job duties. Writing e-mail).	10	MyWordBook, Rosetta Stone Vialogues
2	Data and facts. ("No place to hide". Internet use. Data verification. Information storage and security).	10	MyWordBook, Socrative, Kahoot!
3	Etiquette. ("Office workers admit being rude." Organizational and corporate culture. Business ethics. Politeness in the workplace. Rules of business etiquette in English-speaking countries. Being honest and polite).	10	MyWordBook, Rosetta Stone, Pear Deck
4	Reputation. ("Fashion's favorite." Famous brands. Fashion industry. Product promotion on the market).	15	Pear Deck
5	Success. (Success and failure. Starting up a business. Success stories/successful companies).	15	Pear Deck, Rosetta Stone,
6	The future. ("A space elevator." Changes for the better? Enterprise capital. Making predictions).	15	Pear Deck, Kahoot!
Total hours		75	

3.2 Formation of the Sample

168 students from Kyiv National University of Trade and Economics participated in the study. The students were enrolled in the 2nd and 3rd year of bachelor programs, which made it possible to assess the development level of their foreign language competence during their studies. Focusing exclusively on the 2nd and 3rd year students was made to ensure equal conditions for learning. Apart from that, it also enables users to obtain up-to-date data because of the development of learning mechanisms using mobile applications. The research participants were students of non-philology majors, who were subdivided into 2 groups after determining their level of English language proficiency. Students with average scores were selected using the median. That being said, 130 students took part in the experiment. The experimental group (EG) consisted of 65 students, and the control group (CG) consisted of 65 students.

3.3 Methods

During the current research, the empirical methods were applied as follows: Comparative method. This method was used to compare modern mobile applications for learning a foreign language, which subsequently made it possible to select the most applicable ones to shape foreign language competence. The obtained results ensured the choice of mobile applications that correspond to the specified educational program.

To probe into the students' opinions regarding the quality of the educational program and to ensure a short period of study, the coefficient of consistency degree was calculated, [17].

3.4 Data Analysis

During the research, the following data collection tools were used:

1. Testing method. The conducted English language test was used to check the vocabulary of students of the experimental and control groups. Before testing, the questions were checked and approved by an expert who is a native English speaker to determine the reliability of the conducted method. The test contained 10 open questions related to the material covered.

2. Survey. The questionnaire was chosen to check the personal impression of the students after the experiment. With the help of the selected tool, the following criteria were determined: the involvement of students when using mobile applications, the quality of absorption of the received information, and the degree of immersion

in mobile applications during education. Verification and translation of the questionnaire were carried out by an expert group consisting of 2 native speakers of the Ukrainian language; and 1 native English speaker. Cronbach's alpha coefficient was used to test the validity and reliability of the instruments. The obtained results confirmed the validity and reliability of the selected instrument and were 0.86.

3.5 Ethical Criteria

It should be mentioned that students' participation in the study was voluntary, in compliance with all the principles in terms of protecting the rights of research participants during data collection and ensuring their safety and confidentiality. The research was based on the principles of impartiality and objectivity in the process of research activities.

4 Results

Initially, according to the developed training program, the task of learning foreign words was set. Understanding and perception of new words took place by ear, without visual interpretation. This contributes to the activation of brain activity after repeating the heard word. Next, after the student learned the word by hearing and also made associations, the spelling of the word was studied. To that end, students had to use the Pear Deck mobile application and insert the appropriate picture or draw it themselves.

To fully consolidate the words, a quiz was conducted using Kahoot! mobile application. Students had to quickly pass 10 test questions that had associations with the studied words. Also, students had to score more points than others to take 1st, 2nd, or 3rd place in the quiz. This greatly contributed to the improvement of leadership qualities and motivation to master new material.

Using MyWordBook while learning a foreign language contributes to the visual perception of educational information. MyWordBook provided an opportunity to develop professional knowledge, and to boost speaking and writing skills by the level of previously acquired knowledge. In the beginning, the study of tense forms was carried out as a result of practical task achievement. To practice writing skills, the MyWordBook application was introduced, which allowed correcting sentences, adding phrases, choosing synonyms, and much more. Moreover, there is an opportunity to ensure the accuracy of task achievement and the selection of tense forms.

The results of checking lexical skills before and after the experiment are presented in Table 3.

Table 3. The obtained results of checking the linguistic skills of students of CG and EG before and after the experiment

	M	SD	M	SD
Control group (CG)	1.30	2.00	3.73**	2.30
Experimental group (EG)	1.96	1.99	4.50**	2.35

Note: ** = statistically significant result <0.01.

The obtained results indicate the effectiveness of using mobile applications to improve students' lexical skills. EG students averaged 4.5 points after using mobile apps. Meanwhile, the control group, which continued its education using traditional methods, averaged 3.7.

Further, the quality of the vocabulary in EG and CG before and after the implementation of mobile applications was determined (Table 4).

Table 4. The obtained results of checking the vocabulary of CG and EG students before and after the experiment

	M	SD	M	SD
Control group (CG)	1.28	2.04	3.73**	2.30
Experimental group (EG)	1.93	1.99	4.50**	2.35

Note: ** = statistically significant result <0.01.

The participants passed a preliminary test of their English language knowledge. There were no statistically significant differences between the two groups, so a t-test of independent samples ($t(2)=(-)1.020$; $p=0.34$) was conducted to compare the primary test of students' vocabulary for the experimental group ($M=1.28$; $SD=2.04$) and the control group ($M=1.93$; $SD=1.99$). Thus, group equivalence was established.

The definition of students' interest in using mobile applications is presented in Table. 5.

Table 5. Results of evaluation by EG students of the mobile applications use

Factor	M	SD
Engagement	5.96	0.79
Ease of use	5.78	0.90
Emotional commitment	6.15	0.88
Attention focus	4.98	0.99
Full immersion	4.88	1.19

Note: * = statistically significant result <0.005.

The obtained results indicate a high degree of personal impression of students during training using mobile applications. Students noted that the selected applications were convenient during use, and interesting, which led to emotional attachment of students.

5 Discussion

The purpose of the study was to determine what role mobile applications can play in learning a foreign language. The results showed a statistically significant increase in the obtained points after the experiment compared to the initial conditions. This finding indicates that modern mobile applications are very effective in supporting vocabulary learning and improving vocabulary in a foreign language, and this is in line with the results obtained by scientists, [18], who also supported the implementation of modern technologies for boosting vocabulary learning in a foreign language. The contribution of our study is that it has provided some preliminary empirical evidence indicating the potential educational value of mobile applications, which has been lacking in previous studies on the same topic, [19], [20] Specifically, previous studies either found no statistically significant differences between the conditions they examined, [15], or they did not measure academic achievement, [21].

Importantly, the research made it possible to evaluate students' learning experiences using mobile applications. The following factors were identified: involvement, attention focus, and total immersion. The obtained results made it possible to state that mobile applications gained high in all three dimensions. This indicates that students who used mobile applications were engaged in the application, and they showed emotional commitment and attention focus while feeling immersed in terms of presence and flow. Also, it is worth noting that the characteristics of a small device, including a small screen and, in most cases, a small keyboard, which in previous studies, [22], were considered extremely inconvenient and caused stress among respondents, were not the main complaint in this study. Our study refutes this, as students noted that learning using mobile devices was very convenient and even engaging. We hold that the difference in the results is that the previous studies were conducted at the beginning of the inception of mobile devices (2007-2008), while smartphones were released and people were not used to working with such small devices. Since smartphones have become more accessible, [23], users have already become familiarized with their use, even so that they do not imagine how they could work without them before.

The results of the study show that the investment of higher education institutions in the implementation of paid mobile applications for learning a foreign language is justified because it stimulates students to better perceive and absorb information and be involved in the learning process.

These results are consistent with recent studies, [2], [24], that compared mobile applications to more traditional technological learning environments. In the studies, [25], [26], the effectiveness of modern technologies in comparison with traditional educational methods was not found.

However, the conducted research showed other results that testify to the effectiveness of mobile applications in improving learning outcomes and promoting the involvement of students in learning a foreign language.

5.1 Limitations of the Study

The main limitations of the conducted research were: a limited period for conducting the research, and not a large sample size. Taking into account these factors, we consider continuing the experiment in this direction for a more in-depth analysis and impact of the use of mobile applications during education.

6 Conclusions

Currently, the acquisition of universal foreign language skills is an indispensable aspect of the competitiveness formation of student youth against the context of modern technologies. Due to the conducted research, we managed to fulfill the goals formulated at the beginning, performed the major research tasks, and provided answers to many questions. The purpose of the research was to analyze the implementation effectiveness of mobile applications in the educational environment to enhance the effectiveness of foreign language learning. The findings of the study made it possible to identify and confirm a significant impact on the study and acquisition of material from a foreign language drawing on the use of mobile applications. The practical value of the study is that the results obtained demonstrate that university teachers can benefit from the fact that undergraduate students will use mobile applications to enhance their vocabulary productivity in the course of learning a new language. It is generally acclaimed that the mobile version has a high usability and yields high learning results as compared to the traditional programs. The findings of this study also demonstrate that teachers' integration of mobile applications into the foreign language curriculum is more likely to lead to positive student perceptions of engagement, attention focus, and immersion, at least in the context of undergraduate introductory language courses. Furthermore, the results also provide an opportunity to pay attention to the implementation of individual mobile applications in

the learning process. Technological education is a crucial function to perform repetitive tasks that can be very boring. Learning a new language is one of them. Therefore, the use of mobile applications, with an interesting interface, as well as words and competition with others can be very encouraging, as well as stimulating in the learning process.

Mobile devices have become an indispensable accessory used by virtually every student in the world. Its ubiquitous features allow using it anywhere, anytime. Given the above, it is a great opportunity to facilitate education for students and teachers. The implementation of m-learning applications can considerably facilitate and encourage the use of these applications in the educational environment.

References:

- [1] I. Zapadynska, The role of learning a foreign language in the globalization process of higher education institutions, *Modern Information Technologies and Innovation Methodologies of Education in Professional Training Methodology Theory Experience Problems*, vol. 66, pp. 89–95, 2023, <https://doi.org/10.31652/2412-1142-2022-66-89-95>.
- [2] J. Rudolph, S. Tan, and S. Tan, ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning and Teaching*, vol. 6, no. 1, pp. 342–363, 2023, <https://doi.org/10.37074/jalt.2023.6.1.9>.
- [3] P. Reddy, K. Chaudhary, and S. Hussein, A digital literacy model to narrow the digital literacy skills gap. *Heliyon*, vol. 9, no. 4, 2023, <https://doi.org/10.1016/j.heliyon.2023.e14878>.
- [4] C. Uz Kurt, E. B. Ekmekcioglu, S. Ceyhan, and M. B. Hatiboglu, Digital technology use of SMEs during the COVID-19 pandemic in Turkey: mobile applications' role on motivation and job performance, *Kybernetes*, 2023, <https://doi.org/10.1108/K-08-2022-1189>.
- [5] N. Murray, A. J. Liddicoat, G. Zhen, and P. Mosavian, Constraints on innovation in English language teaching in hinterland regions of China, *Language Teaching Research*, vol. 27, no. 5, pp. 1246–1267, 2023, <https://doi.org/10.1177/1362168820979855>.
- [6] S. K. Pangeni, Use of a mobile application for communication, interaction, and learning: Lessons from an action research, *J Train Dev*, vol. 6, no. 1, pp. 60–70, 2021, <https://doi.org/10.3126/jtd.v6i01.41781>.

- [7] M. Papastergiou, P. Natsis, N. Vernadakis, and P. Antoniou, Introducing tablets and a mobile fitness application into primary school physical education, *Educ Inf Technol*, vol. 26, pp. 799-816, 2021, <https://doi.org/10.1007/s10639-020-10289-y>.
- [8] T. Sadykov, H. Ctrnactova, and G. T. Kokibasova, Students' opinions toward interactive apps used for teaching chemistry, *Bulletin of the University of Karaganda – Chemistry*, vol. 103, no. 3, pp. 103-114, 2021, <https://doi.org/10.31489/2021Ch3/103-114>.
- [9] H. Puspitasari, R. F. Maharani, W. H. Setyawan, and Y. Primasari, Android-Based Mobile Application for Vocabulary Learning, *Jurnal Pendidikan Dan Pengajaran*, vol. 55, no. 3, pp. 469-479, 2022, <https://doi.org/10.23887/jpp.v55i3.40661>.
- [10] P. Polakova, and B. Klimova, Vocabulary Mobile Learning Application in Blended English Language Learning, *Front Psychol*, vol. 13, 2022, <https://doi.org/10.3389/fpsyg.2022.869055>.
- [11] B. Klimova, Impact of mobile learning on students' achievement results, *Education Sciences*, vol. 9, no. 2, pp. 90, 2019, <https://doi.org/10.3390/educsci9020090>.
- [12] B. Klimova, and M. Pikhart, New advances in second language acquisition methodology in higher education, *Education Sciences*, vol. 11, pp. 128, 2021, <https://doi.org/10.3390/educsci11030128>.
- [13] L. Maketo, T. Issa, T. Issa, and S. Z. Nau, M-Learning adoption in higher education towards SDG4, *Future Generation Computer Systems*, vol. 147, pp. 304-315, 2023, <https://doi.org/10.1016/j.future.2023.05.010>.
- [14] M. Yao-Ping Peng, Y. Xu, and C. Xu Enhancing students' English language learning via M-learning: Integrating technology acceptance model and S-O-R model, *Heliyon*, vol. 9, no. 2, 2023, <https://doi.org/10.1016/j.heliyon.2023.e13302>.
- [15] E. V. Soboleva, N. N. Vekua, S. Y. Novoselova, G. Yang, Achieving personal educational results of secondary school students in the conditions of integrated informatization in teaching Chinese as a foreign language, *Perspectives of Science and Education*, vol. 55, no. 1, pp. 284-300, 2022, <https://doi.org/10.32744/pse.2022.1.18>.
- [16] J. Senanayake, H. Kalutarage, M. O. Al-Kadri, A. Petrovski, and L. Piras, Android Source Code Vulnerability Detection: A Systematic Literature Review, in *ACM Computing Surveys, Association for Computing Machinery*, 2023, <https://doi.org/10.1145/3556974>.
- [17] E. O. Bereczki, and A. Kárpáti, Technology-enhanced creativity: A multiple case study of digital technology-integration expert teachers' beliefs and practices, *Think Skills Creat*, vol. 39, 2021, <https://doi.org/10.1016/j.tsc.2021.100791>.
- [18] W. C. Fang, H. C. Yeh, B. R. Luo, and N. S. Chen, Effects of mobile-supported task-based language teaching on EFL students' linguistic achievement and conversational interaction, *ReCALL*, vol. 33, no. 1, pp. 71-87, 2021, <https://doi.org/10.1017/S0958344020000208>.
- [19] S. M. Amelina, R. O. Tarasenko, S. O. Semerikov, and L. Shen, Using mobile applications with augmented reality elements in the self-study process of prospective translators, *Educational Technology Quarterly*, vol. 2022, no. 4, pp. 263-275, 2022, <https://doi.org/10.55056/etq.51>.
- [20] F. Jia, D. Sun, Q. Ma, and C. K. Looi, Developing an AI-Based Learning System for L2 Learners' Authentic and Ubiquitous Learning in English Language, *Sustainability (Switzerland)*, vol. 14, no. 23, 2022, <https://doi.org/10.3390/su142315527>.
- [21] R. Zhang, and D. Zou, "A state-of-the-art review of the modes and effectiveness of multimedia input for second and foreign language learning," in *Computer Assisted Language Learning*, Routledge, 2022, <https://doi.org/10.1080/09588221.2021.1896555>.
- [22] R. Gafni, and N. Geri, Generation Y versus Generation X: Differences in smartphone adaptation, in *Proceedings of the CHAIS Conference on Instructional Technologies Research: Learning in the Technological Era*, Raanana, Israel, 2013, [Online]. <https://api.semanticscholar.org/CorpusID:6894752> (Accessed Date: October 25, 2023).
- [23] C. Zhang, and L. Tang, Research on online and offline comprehensive intervention program of adolescent healthy use of mobile phone, *Chinese Journal of School Health*, vol. 43, no. 6, pp. 843-846, 2022, <https://doi.org/10.16835/j.cnki.1000-9817.2022.06.011>.
- [24] T. L. Vu Anh, and T. Le Quoc, Development orientation for higher education training program of mechanical engineering in industrial revolution 4.0: A perspective in Vietnam, *Journal of Mechanical Engineering*

Research and Developments, vol. 42, no. 1, pp. 71–73, 2019, doi: 10.26480/jmerd.01.2019.71.73.

- [25] C. Y. Chang, H. Y. Sung, J. L. Guo, B. Y. Chang, and F. R. Kuo, Effects of spherical video-based virtual reality on nursing students' learning performance in childbirth education training, *Interactive Learning Environments*, vol. 30, no. 3, pp. 400-416, 2019, <https://doi.org/10.1080/10494820.2019.1661854>.
- [26] M. Järvis, L. Ivanenko, I. Antonenko, T. Semenenko, A. Virovere, and T. Barantsova, Application of the integration model in the system of inclusive education, *Journal of Curriculum and Teaching*, vol. 11, no. 1, pp. 35–44, 2022, <https://doi.org/10.5430/jct.v11n1p35>.

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy):

The authors equally contributed to the present research, at all stages from the formulation of the problem to the final findings and solution.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself:

No funding was received for conducting this study.

Conflict of Interest:

The authors have no conflicts of interest to declare that are relevant to the content of this article.

Creative Commons Attribution License 4.0 (Attribution 4.0 International, CC BY 4.0)

This article is published under the terms of the Creative Commons Attribution License 4.0

https://creativecommons.org/licenses/by/4.0/deed.en_US