Comparing the efficiency of podcasts and mobile applications in the study of the german language by university students

Comparación de la eficiencia de podcasts y aplicaciones móviles en el estudio del idioma alemán por estudiantes universitarios

Lidiia Oliinyk
lidiaol1976@ukr.net
https://orcid.org/0000-0003-1401-9223
Candidate of Philological Sciences (Ph. D.), Associate Professor, Department of Theory, Practice and Translation of German, Faculty of Linguistics, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine.

Iryna Gaman
irinagaman32@gmail.com
https://orcid.org/0000-0002-9042-5162
Candidate of Philological Sciences / PhD in Philology, Associate Professor, Department of Theory, Practice and Translation of German, Faculty of Linguistics, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine.

Olena Chaikovska
chaikovska24@gmail.com
https://orcid.org/0000-0001-9945-4296
Candidate of Philological Sciences (Ph. D.), Docent, Department of Theory, Practice and Translation of German, Faculty of Linguistics, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" Kyiv, Ukraine.

Olena Bezzubova
abezzubova@gmail.com
https://orcid.org/0000-0003-2767-7217
Candidate of Philological Sciences / PhD in Philology, Associate Professor, Department of Theory, Practice and Translation of German, Faculty of Linguistics, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine.

Marianna Paustovska
mpaustovska@ukr.net
https://orcid.org/0000-0002-1228-2178
Candidate of Pedagogical Sciences, Associate Professor, Department of Germanic and Romance Languages, Pedagogical Faculty of Romano-Germanic Philology, Kyiv National Linguistic University, Kyiv, Ukraine.

Abstract

The article aims to study and compare the efficiency and effectiveness of podcasts and mobile applications in the study of the German language by students of the faculty of linguistics. The research involved several key stages: (1) studying scientific publications

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that demonstrate the experience of using the studied methods in teaching a foreign language in university; (2) selecting a sample from the 2- and the 3-year students of the faculty of linguistics, Philology; (3) the diagnostic stage that includes testing to identify the level of knowledge of students and dividing participants into groups according to the test results; (4) the forming stage that presupposes studying with the use of podcasts and a mobile application; and (5) the final stage with re-testing followed by quantitative and qualitative analysis of the research results. It has been discovered that podcasts and the mobile application have a higher efficiency of learning a foreign language, compared to the method of traditional home assignment. At the same time, podcasts are more effective in developing students' communicative competence, enriching vocabulary and improving the knowledge of orthoepic standards of the German language, while the mobile application showed the best results in developing students' grammar, spelling and punctuation skills.

Keywords: German language teaching methods, podcasts, mobile applications, mobile learning, distance learning, effective methods of studying German language.

Resumen

El artículo tiene como objetivo estudiar y comparar la eficiencia y eficacia de los El artículo tiene como objetivo estudiar y comparar la eficiencia y eficacia de los podcasts y las aplicaciones móviles en el estudio del idioma alemán por parte de los estudiantes de la facultad de lingüística. La investigación involucró varias etapas clave: (1) estudiar publicaciones científicas que demuestren la experiencia del uso de los métodos estudiados en la enseñanza de una lengua extranjera en la universidad; (2) seleccionar una muestra de los estudiantes de 2 y 3 años de la facultad de lingüística, Filología; (3) la etapa de diagnóstico que incluye pruebas para identificar el nivel de conocimiento de los estudiantes y dividir a los participantes en grupos de acuerdo con los resultados de las pruebas; (4) la etapa de formación que supone estudiar con el uso de podcasts y una aplicación móvil; y (5) la etapa final con nuevas pruebas seguidas de análisis cuantitativo y cualitativo de los resultados de la investigación. Se ha descubierto que los podcasts y la aplicación móvil tienen una mayor eficiencia en el aprendizaje de un idioma extranjero, en comparación con el método de asignación tradicional en el hogar. Al mismo tiempo, los podcasts son más efectivos para desarrollar la competencia comunicativa de los estudiantes, enriquecer el vocabulario y mejorar el conocimiento de los estándares ortopédicos del idioma alemán, mientras que la aplicación móvil mostró los mejores resultados en el desarrollo de las habilidades de gramática, ortografía y puntuación de los estudiantes.

Palabras clave: métodos de enseñanza del idioma alemán, podcasts, aplicaciones móviles, aprendizaje móvil, aprendizaje a distancia, métodos efectivos para estudiar el idioma alemán.

1. Introduction

The use of various technical teaching aids has been an urgent problem of scientific research since the end of the last century. Alongside the development and improvement of computer and mobile technologies, pedagogical science has formed its set of techniques related to the use of multimedia technologies in the educational process. Today, there is hardly a university student who does not have a smartphone with access to the World Wide Web. In addition, numerous studies and social surveys confirm the fact that various digital gadgets have long been an integral part of the lives of modern youth, taking up more and more of their time and attention. 2020 posed a new challenge for the global educational space. The pandemic that has spread around the world has forced in a short time to form and apply a totally new approach to education at all levels, namely distance learning. Although methods of using mobile applications and podcasts while studying a foreign language have been the subject of a lot of theoretical and practical research in the fields of pedagogy and linguistics, the comparative efficiency of such applications remains insufficiently studied. In our opinion, practical developments in this direction are also insufficient. In particular, there are no specialized mobile applications for students of higher educational institutions of philological faculties to learn German in contrast to mobile apps for learning English.

Domestic and foreign lecturers substantiate in their scientific research the potential of mobile learning, prospects for its development, advantages and disadvantages.

The research focuses on the didactic characteristics and methodological functions of podcasts, the choice of texts for podcasts (authentic vs. adapted texts, types of texts), the mechanism of organizing the learning process through podcasts (Sysoiev, 2014). In the scientific articles where mobile applications are the subject of research, the functionality of educational mobile applications, range of trained skills, target audience are evaluated (for example, studies removed applications that are aimed only at learning basic speaking and reading skills needed during a short stay in a foreign country, during a tourist trip), focus only on selected applications or only on training certain skills (listening) (Demouy, Jones, Kan, Kukulska-Hulme & Eardley, 2015; Kukulska-Hulme, Norris & Donohue, 2015; Gafni, Biran & Rahmani, 2017; Jamaldeen, Hewagamage & Ekanayaka, 2018; Hwang & Fu, 2019; Nalyvaiko, Vakulenko & Zemlin, 2020).

Note that both practice-oriented research (for example, the creation of mobile applications to expand vocabulary) and theoretical review of sources relate exclusively to English-language materials, although among the common platforms with podcasts in the general list for the most popular languages (English, French, German) is mentioned such as www.podcast.de. (Andersen, 2013; Wu, 2015; Khalitova & Gimaletdinova, 2016; Zhang, 2016; Oriogu, Ejemezu & Ogbuiyi, 2018; Hwang, Hsu & Hsieh, 2019).

Having analyzed 16 scientific publications, Czech researchers Kacetl and Blanka Klímová (2019) state the mobile learning is becoming an integral part of the educational process

in higher education institutions. The authors also note a significant number of benefits of using mobile devices when teaching a foreign language, namely mobility, individual orientation, etc. The researchers, havingstudied the experience of using mobile applications in learning a foreign language, point out a number of peculiarities:

- mobile application significantly increases students' interest in studying the subject;
- lecturers should control the use of a mobile application in the educational process;
- an important disadvantage of educational mobile applications is that they are mostly developed not by specialists in foreign language teaching;
- mobile applications allow to provide a maximum of individual approach while language learning and increase students' motivation.

A Spanish educator, Ghada Awada (2016), researched the effectiveness of using the WhatsApp mobile application when learning a foreign language, and also studied its potential as a method of increasing students' motivation to study. The author of the experiment argues that mobile learning can be a logical complement to traditional teaching forms and methods. In addition, it corresponds to the realities of modern learning, increases the level of social communication of students during online discussions, promotes the use of authentic materials necessary for comprehensive learning (p. 2).

Mobile applications and podcasts help to expand vocabulary, grammar, improve the perception of oral speech of native speakers. The most popular applications and podcasts to learn foreign languages are the following: Duolingvo, LinguaLeo, Listening Drill, Bussu, Mondly, Learn German, Rosetta Stoneta, etc. The list encompasses the most effective programs for learning foreign languages. The number of downloads of these applications reaches 5 million. The programs are designed both for children and adults. The functions of these programs include: (1) online games to score points, (2) creating one's own voiced vocabularies, (3) materials for listening, reading, writing, video lessons, grammar and vocabulary exercises.

A huge advantage is the availability of a clear and easy to use interface, several types of interactive training and the fact that applications are free. Using certain applications, one can learn the language from scratch and can study it from the level that he/she has already reached.

Mobile applications are polycoded texts. In linguistics, a polycoded text is defined as a complex structural unit that contains signs of different semiotic systems: text, images (pictures, photographs, diagrams, histograms, various schematic images, etc.), voice, and music. The main advantage of such texts is their high informational and polysemantic value. According to I. Kolehaieva (2015), additional components help decode the information contained in the text more easily, provided that they are optimally selected and used (p. 107). The textual component in such units is defined as verbal one, and all other auxiliary components in national linguistics have received the definition of iconic

ones. Polycoded podcasts are mostly a combination of video and audio components (Heil, Wu, Lee & Schmidt, 2016).

A number of researchers (Agafonova, 2011; Odinokaya & Nesvetova, 2017; Klímová & Prazak, 2018; Kuimova, Burleigh, Uzunboylu & Bazhenov, 2018) studied the relevance and efficiency of using mobile applications to develop foreign language competencies of students of non-philological specialties. The researchers point out that although modern students actively use mobile phones in everyday life, the use of smartphones in the educational process is not widespread. The authors of the research also pay attention to the problem of lack of specialized mobile applications to learn foreign languages by students of higher education institutions, as well as that there is a lack of methods for developing the lexical competence in these popular applications.

Sangeeta Johri (2020) identifies the following shortcomings of mobile learning: lack of pedagogical justification when using these programs; a high cost of applications; lack of contact with people, etc.

A significant number of publications are also devoted to the use of podcasts in the study of a foreign language at a higher education institution. O. Betsko (2012) characterizes this phenomenon as follows: "Podcasts are audio blogs or online broadcasts that can be easily downloaded to an MP3 player and listened to at any time convenient for the user; these are individual files or a series of files that are posted to the same address on the Internet and are regularly updated. Podcasts are most in demand among owners of electronic equipment like personal computers, portable players and all kinds of mobile devices. For the convenience of playing podcasts, appropriate software has been developed. It regularly requests the website for new recordings, in order to download them to the user's computer. The user, in turn, decides how and where he/she uses the recordings. Podcasts usually have a specific theme and frequency, with which they are uploaded" (p. 35).

The full potential of this technology is revealed in the process of teaching a foreign language, because the language itself, as a means of transmitting information, is the object of study (Stefancik & Stradiotová, 2020). When teaching different types of speech, the use of podcasts promotes increase in motivation to learn a foreign language, the emergence of a variety of phonetic material, the development of listening skills and the ability to perceive different speech styles with different accents and intonations, the improvement of speaking skills (Troshina & Verbickaja, 2015).

Thus, the scientific literature provides mainly theoretical research on the use of mobile applications and podcasts in the study of a foreign language with only few dedicated to methods of using social networks and the development of an original mobile application or podcast. Apart from that, methodology of creating podcasts and mobile applications to learn foreign languages at a higher education institution is insufficiently discussed. There are also no studies on comparing the effectiveness of the most popular methods of mobile

learning, in particular the use of social networks, messengers, podcasts and mobile applications. Therefore, the purpose of our study is to compare the effectiveness of podcasts and mobile applications in the study of foreign languages by students, identify the main disadvantages of these teaching methods as well as formulate further recommendations for their elimination.

2. Aim and hypothesis

Preliminary study of the chosen topic has given grounds to hypothesize that mobile applications have greater potential for effectiveness in learning German by students of philological faculties, as their structure allows creating a polycoded didactic unit that optimally combines signs of different semiotic systems: visual, sign and audio systems, etc.

The aim of the study consists of several key points:

− to specify the frequency of mobile apps and podcasts use by university students in their daily lives;
− to carry out a comparative analysis of the use of podcasts and mobile applications when teaching the German language to the second- and the third-year students of the faculty of linguistics;
− to formulate guidelines for improving the efficiency of mobile learning technologies in the study of German in a higher education institution based on quantitative and qualitative analysis of the results.

3. Methods

Research Design

In the process of working on the chosen topic, we used the following mixed research methods:

− surveying (to specify the frequency of use and the intended use of mobile apps and podcasts by students);
− testing (to determine the level of proficiency in German of students);
− pedagogical experiment (the formulating stage);
− mathematical analysis (calculation of averages and percentages) and
− data analysis.

Participants

We conducted the survey among 120 students and 6 lecturers of the faculty of linguistics (the 2nd and 3rd years of studying) of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", as this number is sufficient to be considered

representative, and all students, according to the curriculum, have the level of language proficiency of at least B1. This level, from the experience of teaching the authors of the study, involves the possession of such language skills and knowledge that would be sufficient for independent work, in particular with mobile apps and podcasts for learning foreign languages.

Instruments and Procedure

To obtain information on the level of familiarity and use by students of applications and podcasts of various functionalities and topics we used questionnaires in the form of Google-Forms with clearly defined "closed" questions, namely dichotomous yes - no (the first question of the questionnaire "Does your smartphone have Internet access ») and polyvariate (the second and third questions of the questionnaire" Which of the following mob applications / podcasts do you use? "), at the same time deliberately abandoned semi-closed questions, as the survey aims primarily to determine the activity of the use of educational mobile applications and podcasts in comparison with at least two other types (based on general trends in content distribution on the Internet with the target audience "youth" were chosen entertaining and aimed at health promotion mobile applications and podcasts).

To determine the level of proficiency in German of students was conducted a testing with the combined tasks, formed in accordance with the knowledge and skills that need to be tested. To determine the level of communication skills, tasks from the books of preparation for the German language exams were used Goethe Zertifikat; Telc B1-B2 (part of the exam "speaking" and "writing"). To test the level of grammar knowledge were involved test tasks from the German-language site Sicher B1-B2. https://www.hueber.de/sicher/einstufungstest.

Calculation of averages and percentages based on the usual rule of determining the arithmetic mean of numerical indicators of results.

Data Analysis

At the preparatory stage of our research, we conducted a short survey among the students. The purpose of this stage of the experiment is to specify the frequency and the intended use of mobile apps and podcasts by students.

The next (diagnostic) stage of the experiment was to conduct educational testing of students in order to determine the level of proficiency in German according to three key indicators:

– communication skills (including orthoepic standards);
– the knowledge of grammar (the use of articles, declension);
– writing skills (spelling and punctuation).

The test consisted of three sections, the maximum number of points that could be obtained for each type of task was 20, the total number of points was 60.

The tasks were divided in the way so that quantitative and qualitative analysis of the effectiveness of the use of podcasts and mobile applications in the study of the German language could be carried out according to the results of the experiment.

According to the results of the diagnostic testing students were divided into 3 groups for the further pedagogical experiment. The division was carried out in such a way that the total number of points received by students in each group was approximately the same. The pedagogical experiment lasted for two months.

The first group studied according to a standard plan and received traditional tasks to get prepared for seminars (including tasks that involved multimedia means, i.e. audio files to the textbooks, etc.).

To get prepared for practical classes, the second group actively used podcasts selected by a lecturer according to the topics they worked on during the classes.

The third group, when preparing for classes, used the DW Learn German application. This free application is available for every Internet user. Its feature is that it offers to study the German language on several levels: A1, A2, B1, B2 of general German and B1 of professional German. The last of these courses contains several sections, which students studied in accordance with the topics of the classes.

The final stage of the experiment involved re-testing of these student groups. For this purpose we used a similar test with modified theoretical and lexical material.

Ethical issues

The experiment was conducted in compliance with all ethical principles necessary in the implementation of such investigations (Bryman & Bell, 2007), namely in compliance with the principles of transparency, integrity, anonymity, protection of personal data of participants (name, surname of students encoded under digital symbols), avoidance of discrimination, the right of participants to participate voluntarily and if desired to leave it at any stage (confirmed by students at the beginning of the experiment with an electronic signature). The course, results and methods of research correspond to its purpose and allow to check the set hypotheses.

4. Results

We will mention that the hypothesis formulated at the beginning of research provided comparing the efficiency of podcasts and mobile applications in the study of the German language by students of philological faculties. The results of the survey on the preparatory stage of our research (specification of the frequency of use and the intended use of mobile

apps and podcasts by students), which correlates with first key point of the aim of the study, are provided in the table.
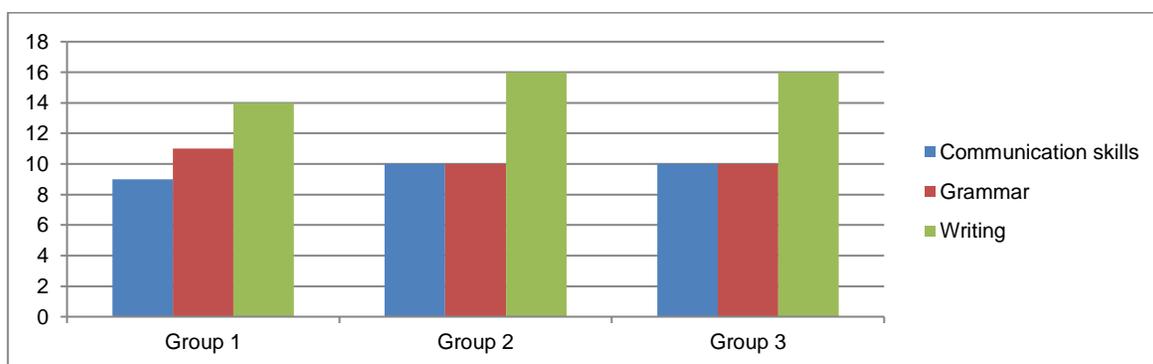
Table 1.
Frequency of use of mobile applications and podcasts by the second- and the third-year students of the faculty of linguistics.

Number of students who have a smartphone with Internet access	The average number of mobile applications in smartphones, including:			The average number of podcasts that students watch during the day, including:		
	Entertaining (including online stores, social networks, etc.)	Educational	Aimed at health promotion	Entertaining	Educational	Aimed at health promotion
200	8	2	3	5	1	3

The results of the survey showed that all students have modern mobile devices and access to the World Wide Web. Most students use mobile applications of entertaining nature, including games, social networks, and messengers. 20% of the total number of mobile applications installed by students on their smartphones are educational or focused on healthy lifestyle and nutrition. Besides, the results of the survey show that podcasts are 40% generally less used by students. The survey showed that students spend much of their free time using mobile applications. However, few students use them in their studies. In our opinion, such interest in mobile applications should be used by teachers in order to intensify students' learning activity, increase motivation to study subjects, increase the amount of time students spend learning material, developing future professional skills and abilities.
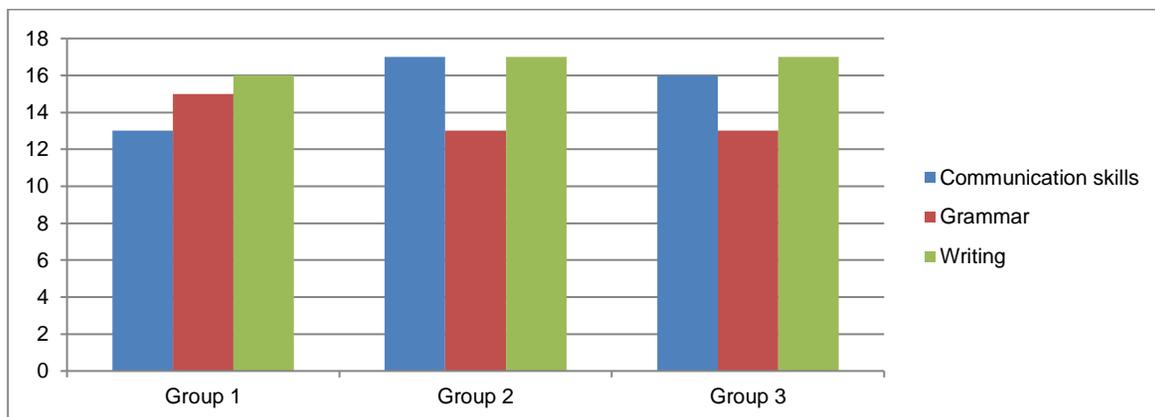
The results of both diagnostic and final testing are represented in the form of diagrams:

Figure 1. The results of the diagnostic testing of three student groups of the faculty of linguistics that participated in the study (the average value of points obtained by a group is indicated).

As the results of the diagnostic testing show, before the experiment students scored the biggest number of points for writing. Speaking part of testing was challenging for the students in terms of the use of vocabulary units as well as observing orthoepic standards of the German language in speech.

The results of the final testing for convenience are also represented in the form of a diagram:

Figure 2. The results of the final testing of three student groups of the faculty of linguistics that participated in the study (the average value of points obtained by a group is indicated).

Comparison of the results of two tests enables to determine the effectiveness of the methods used in quantitative terms (realization of the second key point of the aim):

- communication skills of student group 1 improved by 44%, we can observe the largest increase in the level of communication skills in the group that worked with podcasts, which is 70%;
- students group 3 demonstrated better results according to this criterion by 60% compared to the initial data of the diagnostic testing. According to the obtained results, the most effective method for improving students' communication skills was active use of podcasts in preparation for classes. Traditional tasks without the use of mobile applications proved to be the least effective;
- grammar knowledge of students group 1 has improved by 36%, and this is the highest figure among 3 groups. In the second group, students showed a result 20% higher than the previous one, the group that worked with the application received 30% better points.

Thus, the most effective methods of developing students' grammar skills turned out to be tasks in textbooks and the mobile application. Spelling skills of student group 1 have improved by 14%, and spelling skills of groups 2 and 3 – by 6 percent, respectively.

Comparison of the data of the diagnostic and final stages of the experiment gives grounds to draw up the following conclusions:

− the use of mobile learning by students when studying a foreign language significantly increases the level of communication skills compared to traditional methods of learning German;
− podcasts due to their content have a greater potential to develop communication skills of students while learning German, compared to the mobile application;
− the use of a mobile application allows increase in the level of knowledge of grammatical standards of the German language better than podcasts, however, according to this criterion mobile learning is inferior to traditional methods of learning a foreign language at a higher education institution;
− podcasts and mobile applications are much inferior to traditional methods of learning a foreign language in the development of students' spelling and punctuation skills.

5. Discussion

Introduction sentence. Digitalization and remoteness, as integral features of modern education, open not only opportunities for all participants in the educational process, but also pose challenges to them. Teachers are expected to master and competently apply new technologies.

Statement of the problem. Mobile applications and podcasts are technical learning tools that teachers have integrated into the learning process before the comprehensive distance education introduced in connection with the coronavirus pandemic. The organization of distance learning, as well as the active use of mobile applications and podcasts by students in their spare time reinforces the need to study the effectiveness of their use in the educational process. The expediency of use of these tools in the study of a foreign language by students of philology is not in doubt, but their analysis requires a clearer framework, namely the definition of the best opportunities in comparative terms particularly with regard to the formation of skills and knowledge of a foreign language.

Review of the Methodology. For comparison of the efficiency of podcasts and mobile applications in the study of the German language by university students were involved qualitative, quantitative methods (surveying, testing, pedagogical experiment (the formulating stage), mathematical analysis and data analysis.

Summary of the main results. The hypothesis about the greater potential of the mobile app for effectiveness in learning German by students of philological faculties (in comparison with podcasts), formulated at the beginning of the research, partially confirmed. As experiment results show, a mobile application has proved to be more effective means of learning German than podcasts. In our opinion, this result is due to the structure and content of mobile applications, i.e. their polycode. There was also a difference in the possibilities of using mobile applications and podcasts to develop certain

skills and knowledge: through learning with mobile applications, the best results are recorded for successful learning of German grammar, while podcasts help to improve communication skills. However, both elements of mobile learning have not been effective enough in comparison with traditional methods of learning a foreign language in the development of students' spelling and punctuation skills, which, in our opinion, are still inferior in priority to the knowledge of grammar and communication skills (speaking and writing).

Reference to previous research. Thus, experiment results correlate with conclusions of the previous researches about the functions of mobile learning as logical complement to traditional teaching forms and methods and about necessity to control of use of a mobile application by the lecturer while working on materials of mobile apps and podcasts by students (selection of topics, types of text, degrees of complexity, responsible homework checking). In our comparative research we have managed to cover the levels of formation of different skills and knowledge of the foreign language, and not just follow the training of some of them (for example, listening training with podcasts).

Discussion of the results. The learning potential of mobile applications is much higher compared to podcasts, due to the fact that the student turns from a passive viewer into an active user. Most podcasts are aimed at a passive perception of information by students, and feedback only takes place in chat or during a discussion after the information is perceived. The mobile application, on the other hand, is aimed at the active participation of the learner. Apart from the perception of information, students have to complete various tasks, and only in case of successful performance they can access the next information block.

The issue of the quality of mobile content available for learning a foreign language deserves special attention. It is worth mentioning that in online stores there are no specialized applications aimed at learning the German language for specific purposes. There are also no applications for learning German for students of philological faculties, designed with the participation of qualified linguists. We are convinced that theoretical research into the use of mobile applications for learning a foreign language should end with the practical development of such content with the involvement of respected linguists and educators.

Recommendations for educators. Implications for practice. To increase the effectiveness of mobile German language learning and teaching German in higher education institutions, it is necessary to find out the reason for such differences, as well as outline the ways of improvement and the principles for developing own podcasts and mobile applications by lecturers. The development of a mobile application is a difficult and troublesome task that requires additional effort from the lecturer, however, as the results of numerous studies (including ours) show the mobile learning is an urgent requirement of nowadays, without which further development of modern education is impossible. If more time and attention are allocated for students to use mobile applications, the

efficiency and effectiveness of learning a foreign language in a higher education institution will significantly increase.

Polycoded podcasts consist of video and audio components. This feature creates certain obstacles for students to master spelling and grammar rules of the German language. Lecturers who create their own podcasts for distant work with students should take this feature into account. Grammar rules shall be clearly visualized and be in students'line of sight for some time. As the results suggest, students better understand the rules and standards that they perceive not only by ear but also visually. For this purpose it is essential to use screenshots that include standards and rules as well as examples of how a word is spelled. Such podcasts will obviously have to be additionally edited that will require additional time, but in this case, the effectiveness of a podcast as a learning means will increase significantly.

An important component of the effectiveness of any teaching method is the constant control by a lecturer over the learning process. This is what distinguishes higher education at an educational institution from self-education. When choosing or creating a mobile application to learn German, the lecturer must make sure that its form and content are fully consistent with the educational and didactic objectives of higher education.

Suggestions for further research. A small sample of our study requires further confirmation of mobile applications to be more effective in learning a foreign language than podcasts. It should be noted that the study was not conducted under the conditions of distance learning – thus requiring additional research of the issue.

Limitations. A small sample of our study requires further confirmation of mobile applications to be more effective in learning a foreign language than podcasts. It should be noted that the study was not conducted under the conditions of distance learning – thus requiring additional research of the issue.

6. Conclusion

The experimental research proved that the use of mobile applications by university students has greater potential to increase the level of knowledge of a foreign language than podcasts. This, should be taken into account by foreign language lecturers when choosing the means of mobile learning, especially in the context of distance learning. The study has revealed the advantages and disadvantages of using podcasts and a mobile application when learning a foreign language. It has been discovered that podcasts contribute to the development of students' communication skills, but the lack of visualization does not allow proper development of students' grammatical skills in German. The results of the study give grounds to assert the need to develop specialized programs for learning German for students of philological and non-philological specialties with the involvement of lecturers, linguists, educators and IT specialists.

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