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Didactic Possibilities of Mobile Applications to Form Intercultural Competence of Students

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Abstract

The current epidemiological situation and the format of distance interaction determine the importance of including digital technologies to form intercultural competence. The problems of obtaining the practice of oral foreign language communication, studying the norms of net etiquette, the rules of ethics in multilingual communication, the mechanisms of word formation are actual. The purpose of the research is to identify the didactic possibilities of mobile applications and purposeful work with m-learning technologies to form intercultural competence of students.

The methodology is based on the analysis of scientific literature on the issues of m-learning. The provisions of the communicative-activity approach are taken into account when integrating mobile applications into the subject-subject scheme of intercultural communication. Empirical methods were used (surveys, analysis of the results of working with mobile applications and MS Teams). The effectiveness of the proposed approach was confirmed by a pedagogical experiment, during which educational activities with mobile applications were organized within the framework of a specially designed module. Research results. The authors describe the possibilities of mobile applications for involving students in active group interaction on the project, professional self-presentation and intercultural communication. In conclusion the conditions under which the integration of mobile applications into the educational process will be most effective are summarized: the targeted nature of

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work with m-learning technologies; collaboration of teachers of various disciplines; conscious participation of students at all stages of choosing and using a mobile application.

Keywords: digital technologies, mobile learning, interaction, language diversity, multilingual communication, educational environment.

1. Introduction

In the modern world, taking into account globalization, the need to establish information interaction with representatives of other countries is increasing. The UN General Assembly has proclaimed the period from 2022 to 2032 as the International Decade of the World's Indigenous Languages. Firstly, this event is aimed at mobilizing resources for their preservation, revival and promotion. Secondly, the proclamation of the "decade of the languages of the world" is one of the important results of UNESCO's activities in the direction of intensifying international cooperation and stimulating the dialogue of nations (Burnet, 2008). Thirdly, recommendations were developed on exactly how states should contribute to the enrichment of the information environment for a deep analysis of modern problems and trends in the development of world languages, for the introduction of scientific developments in the educational process. As part of the implementation of these recommendations, international events are being held to develop new approaches to the development of foreign language communication. In practice, it has been demonstrated that tasks focused on the creation of verbal patterns are positively perceived by students. Relevant activities support the atmosphere of creativity and facilitate easier perception of the facts of scientific information.

As a result, a special place is given to form intercultural competence in the digital educational environment: foreign language communication should be organized in all areas of training of specialists at a sufficiently high level. This is also an important condition for graduates to have the opportunity to take an active part in the life of the international scientific community. In-demand professionals need to master all the means of exchanging information with foreign colleagues.

J. Picatoste, L. Pérez-Ortiz, S. M. Ruesga-Benito determine that the resources of mobile technologies must be integrated into the learning process (Picatoste et al., 2018). Indeed, at present, university students are actively using a variety of mobile applications, which are becoming real tools for interactivity and obtaining various types of information. However, in practice, the integration of mobile applications into intercultural communication is accompanied by many problems:

- how to identify and select a mobile application that helps achieve educational goals, meet the challenges of the future, the demands of the digital society, the needs of the students themselves;

- how to use the mobile application as efficiently as possible, i.e., shift the emphasis during integration to its didactic, rather than entertainment potential;

- how to organize a mandatory check of self-directed learning, compliance with the level of material complexity to the curriculum, training and gradual formation of self-control skills, taking into account individual characteristics of students;

- how to maintain the leading role of the teacher in the transfer of new knowledge, education of the individual, socialization and professional self-determination.

And finally, new realities of the digital society necessitate the transformation of education, taking into account sanitary and epidemiological conditions.

In the modern world, mobile applications occupy a significant place precisely due to their unique capabilities for transmitting, searching, processing information; management of information and socio-economic systems; organization of interactivity and interaction. The current situation with COVID-19 and temporary transition to distance work only show their importance in various areas of life and fields of activity, including professional foreign language, intercultural communication.

So, the introduction of mobile learning technologies (m-learning), according to P. Cabrera-Solano, A. Quinonez-Beltran, P. Gonzalez-Torres, C. Ochoa-Cueva, L. Castillo-Cuesta (Cabrera-Solano et al., 2020), helps the activation of professional foreign language, intercultural communication, intensification of knowledge, differentiation in learning. However, like any means, according to K. C. Brata, A. H. Brata, they have their advantages and disadvantages (Brata, Brata, 2020). The task of the teacher is their optimal integration into the educational process and intercultural interaction.

Thus, there is a need for further research of the potential of mobile applications in the context of the new epidemiological situation and the development of distance learning.

1.2. Objectives of the research
The purpose of the work is determined from the need to identify the didactic capabilities of mobile applications and to determine the effectiveness of targeted work with m-learning technologies form intercultural competence.

Research objectives:
- to determine the potential of m-learning in the new epidemiological situation and distance interaction;
- to analyze the experience of using mobile services in online learning and multilingual communication at a distance;
- to identify new promising areas for the use of mobile applications for distance foreign language information interaction;
- to describe the stages of systematic purposeful work that allows the most effective use of mobile applications to form intercultural competencies of students;
- to confirm the effectiveness of the proposed educational and cognitive activity for the formation of intercultural competencies of students experimentally.

2. Relevance
2.1. Literature review
2.1.1. Analysis of Russian scientific and pedagogical literature
Intercultural competence is considered by O.E. Khukhlaev, M.Yu. Chibisova as the ability of a person to function effectively when communicating with representatives of different nations and in different cultural environments. Its importance for solving specific professional problems in a multicultural environment, according to these scientists, is obvious. The authors note that if the achievement of a certain level of intercultural competence allows solving problems associated with cultural differences, then a high level of intercultural abilities allows using cultural diversity as a resource (Khukhlaev, Chibisova, 2010). In this regard, the issue of measuring intercultural competence is extremely relevant both for the research field and for teaching practice.

According to O.A. Obdalova, O.V. Odegova, the inclusion of students in foreign language information interaction should no longer be an end in itself (Obdalova, Odegova, 2018). The language of another country, another culture can be used as a learning tool for seminars and lectures. In addition, intercultural communication is becoming the leading activity of a modern scientist.

Intercultural communication of the future specialist is understood by N. A. Sergeeva et al. as a software-mediated context of any interaction of foreign language teachers based on foreign language communicative activities in the field of multicultural education (Sergeeva et al., 2021).

According to V. V. Matveev et al. features of intercultural communication based on digital technologies must be taken into account when designing a system for training a professional of the future at the following levels (Matveev et al., 2021):
- with organizing intercultural interaction in the digital environment as a special communicative social space, a special place for the implementation of the language;
- with verbal communication expressed using electronic texts;
- with the development of linguistic diversity in cyberspace and the organization of equal access through global networks to any information that is in the public domain.

In the domestic theory and practice of integrating mobile applications into education, there are following areas of research: highlighting the features, principles and advantages of using m-learning technologies in the educational process of higher education (Soboleva, Perevozchikova, 2019); description of specific organizational forms and teaching methods to form various competencies (Levina, Goncharova, 2021). D.D. Klementiev and V.V. Klementieva emphasize the expediency of using accessible mobile applications in education on specific examples to optimize classroom lessons and self-directed learning (Klimentyev, Klimentyeva, 2018). E.A. Komochkina, L.V. Yarotskaya substantiate the need for the introduction and use of mobile technologies in the system of higher education. The authors consider in detail mobile applications for systematic evaluation and control (Komochkina, Yarotskaya, 2020).

The work of E.V. Tikhonova, A.S. Potapova, A.V. Kreider also reveals the goals of using innovative technologies for a foreign language teaching: providing the possibility of continuous learning regardless of age, place and time; creation of a unified information and educational environment (Tikhonova et al., 2018).

The use of m-learning technologies, as noted by N.S. Petrishcheva, T.G. Rybalko, allows "updating students' knowledge, engaging them in an active dialogue, learning to express their point of view, demonstrating their skills and developing certain skills" (Petrishcheva, Rybalko, 2020). This circumstance is especially important for training and practice of solving future professional problems, reaching the level of professional competence.

The use of mobile applications, as substantiated by N.N. Serostanov and E.I. Choporova, meets the requirements of modern education standards and, subject to the conditions for effective organization, helps the activation of the didactic process (Serostanova, Choporova, 2020).

O. Kalugina, N. Tsarevich prove that in the system of professionally oriented education, directions for the development of innovative processes have been outlined: a change in the role of the teacher in the educational process; increasing student autonomy; diversification of the content of training; strengthening interdisciplinary links between the study of a foreign language and other disciplines; changing the nature of profiling; increasing interest in project-based and blended learning technologies (Kalugina, Tarasevich, 2018).

M-learning technologies significantly expand the possibilities of implementing the procedure for assessing students' achievements. According to the communicative characteristics, D. Bartosh, N. Galskova, M. Kharlamova, E. Stoyanova distinguish two models of interaction at the stage of systematization and control: "student – mobile application" and "student – mobile application – teacher" (Bartosh et al., 2020).

Another classification was proposed by N.V. Vasiliev, V.V. Grigoriev, Golubev, I.V. Evgrafov (Vasiliev et al., 2017). The paper considers two models for using mobile applications: choose your device and bring your device. So, mobile technologies make it possible to significantly expand the practice of foreign language communication with native speakers and engage in intercultural communication. O. Putistina also notes that it is necessary to monitor the compliance of the level of the material complexity with the curriculum, to ensure the gradual formation of self-control skills, taking into account the individual characteristics of students (Putistina, 2015).

One of the problems of a modern university in the new sanitary and epidemiological conditions, as noted by N.A. Sergeeva et al., is the organization of oral, professionally oriented foreign language communication. In their opinion, the effectiveness of the implementation of teaching foreign languages during the coronavirus pandemic depends on the level of students' motivation to study the discipline, the presence of clearly structured advanced homework assignments and the use of active teaching methods during online classes (Sergeeva et al., 2021).

Another important position for the research is presented in the work of D. A. Ivanchenko (Ivanchenko, 2014). The scientist concludes that it is advisable to use a complete set of such mobile applications: universal mobile services, mobile identification and authentication tools for effective communication and distance interaction in a higher education institution.

Thus, despite the fact that there are enough works on m-learning and their formation by means of intercultural foreign language communication, there are two important circumstances:

- in most of them, mobile applications are used only at one stage of education (actualization, motivation, new material, consolidation/systematization, control or reflection);

- the sanitary and epidemiological situation and distance learning require a revision of methods and forms of interaction.

Due to the fact that formation of intercultural competence of a highly qualified and competitive specialist is a priority of the modern educational space, there is an objective need for additional study of the didactic potential of mobile applications in the context of the new epidemiological situation and the development of a remote interaction format.

2.1.2. Analysis of foreign research

Modern society is characterized by a sharp intensification of migration processes and clashes with representatives of other cultures, which differ in many respects from the indigenous people. Possession of intercultural competence, according to H. Trisasanti et al., allows to build relationships with representatives of other cultures with knowledge of their characteristics, due to

differences in traditions, norms, behavior, appearance and many other things that are behind the focus of attention externally observed (Trisasanti et al., 2021).

The personal qualities and professional competencies necessary for a specialist of the future in order to interact in a multicultural environment, given its diversity, for the implementation of developmental activities, according to G. Tutunea, include the ability to form and develop universal learning activities, patterns and values of social behavior, multicultural communication skills and tolerance (Tutunea, 2021).

At the personal level, as M.J. Ennis et al. prove, multicultural education help form professionally significant qualities of students as a system of professionally significant affective and subjective-volitional characteristics, the presence and degree of formation of which ensure the successful implementation of the professional activities of a teacher in a multicultural educational environment (Ennis et al., 2021). At the level of society, as shown in the work of H. Trisasanti et al., multicultural education helps overcome interethnic conflicts and, as a result, better efficiency in the cooperation of citizens who proclaim certain values of a particular culture (Trisasanti et al., 2021).

A foreign language is included in the basic cycle of the humanities studied at many levels of education, including at the stage of higher education. This, as N. Yemez, K. Dikilitaş substantiate, means that the teacher of a foreign language faces the task of developing in students both communicative skills (listening, speaking, reading and writing), language skills (phonetic, lexical, grammatical), and sociocultural awareness (Yemez, Dikilitaş, 2022). These findings allow them to suggest that turning to productive models of a foreign language teaching can not only help improve communication skills and language skills, but also stimulate the formation of outside-the-box thinking professionals who are able to creatively refract the acquired knowledge in practice.

The Universal Declaration on Cultural Diversity, adopted by UNESCO, defines the range of activities that countries/states should implement (UNESCO: Building peace..., 2022):

– preservation of the linguistic heritage of mankind, promotion of the dissemination of creative ideas;

- encouragement of linguistic diversity, fostering respect for the mother tongue, promoting the study of several languages from childhood.

Undoubtedly, classes in the form of conferences, linguistic and cultural quizzes, virtual tours, debates, creative competitions and presentations, projects and days of national culture are effective for the formation of intercultural competence. So, it is necessary to create educational communicative situations that determine the conditions and goals of communication for the organization of intercultural communication in the classroom for a practical course of a foreign language.

For example, cultural competition. Students are offered images of famous scientists of various nationalities. The task is to correlate each portrait with an attribute of the activity that glorified this person. To check the correctness of the answer, you need to "click" on the portrait. Or, it is proposed to correlate the portrait with the type of activity that glorified the person.

This type of task provides an opportunity to get acquainted with the manners and etiquette of different countries; help to understand the peculiarities of the culture of other peoples, thus forming multicultural competence; provide a communicative orientation of training; help develop practical skills and creative abilities of students by stimulating the vigorous activity of their thinking and speech.

R. Barac et al. argue that work in accordance with these areas must begin at preschool age and continue at all stages of education (Barac et al., 2014). Including in the practice of university teaching. N. Yemez, K. Dikilitaş conclude that the learning model in the modern multicultural world should involve the formation of a creative personality capable of independent creative search for solving professional problems (Yemez, Dikilitaş, 2022). M. Elphik considers the possibilities of mobile technologies in terms of increasing the creative potential of students (Elphik, 2018).

In particular, A. Andujar et al. identify the following goals for using digital tools for learning a foreign language: improving the quality and efficiency of mastering theoretical material; activation of knowledge and support of professional self-determination; implementation of intersubject communications; increase in the volume and optimization of the search for the necessary information; development of communication skills (Andujar et al., 2020). G.E. Putrawan, B. Riadi explore the potential of m-learning specifically for the modern educational space (Putrawan, Riadi, 2020).

In the new sanitary and epidemiological conditions, mobile learning is characterized by the following features: interaction and collaboration in the network, regardless of the location of

students and teachers; use of a mobile device as a source of organizational, methodological, reference and educational materials; providing students with the opportunity to adjust the content; researching; learning at your own pace based on the multimedia content of mobile devices (Nadeem et al., 2020).

Thus, in the course of analytical work with the literature, it is substantiated that

- promoting linguistic diversity, promoting the dissemination of creative ideas, incorporating digital resources into learning are initiatives supported at the UNESCO level;

- the formation of intercultural competence determines the formation of professional competencies of future specialists;

- a foreign language teaching has a powerful didactic potential for the development of intercultural competence;

- in the modern educational space and the conditions of the spread of COVID-19, new digital tools are emerging that create additional conditions for the formation of intercultural competencies of students.

It is necessary to determine the conditions under which new digital technologies most effectively realize their potential in distance learning for specialists whose future professional activity involves solving problems in the field of education, healthcare, culture, sports, management, and social assistance to the population (Günday, Çamlioğlu, 2016).

3. Materials and Methods
3.1. Theoretical and empirical methods

The following methods were used in the work: theoretical analysis and generalization of literature in describing the conditions for effective training of future specialists in the context of the spread of COVID-19; features of the inclusion of mobile services in multicultural education, adaptation and socialization of the individual; the didactic potential of digital tools to enhance foreign language communication and dialogue between representatives of different cultures.

The research methodology takes into account the key principles of task-based learning (hereinafter – TBL). TBL is a kind of communicative method. Technology places a strong emphasis on skills and competencies. The basic principle of TBL is that it is important not only what is taught, but also why in this way.

The execution of tasks using mobile resources includes the following steps: problem statement (tasks) – selection of a mobile application – planning activities in the MS Teams space – execution – reflection (assessment of the solution itself and the effectiveness of choosing a service).

The second principle is the selection of means and methods for overcoming communication problems. All activity with mobile applications is subordinated to the goal of developing the skills required to master any language (reading, grammar, speaking, listening and writing). Mastering the required material in a short time and with sufficient efficiency is due to the fact that the key expressions of the language of another country, grammatical structures, vocabulary are conveyed to the student using a mobile application, in a real and emotionally charged situation.

Simulation of dialogues of professional communication, intercultural communication in the space of a mobile application is used to simulate educational practical activities that allow students to "pass the situation through themselves". This increases the efficiency of mastering another language, since along with the intellect, the emotional factor is connected. The task of the teacher when integrating mobile technologies into the study of educational material is to create a situation that motivates the student to research, search for solutions to creative issues, and develop grammatical and lexical structures in speech.

To obtain up-to-date information about changes in the level of skills that make up the essence of intercultural competence, empirical methods were used (observation, analysis of the results of working with mobile applications and MS Teams).

The conversation as a psychological method provided for direct or indirect, oral or written receipt from the student of information about his activities. With the help of the method, the most significant, characteristic of the subject, psychological phenomena were objectified. Types of conversations used: interviews, questionnaires and psychological questionnaires.

The experimental study was carried out on the basis of the Vyatka state university. The integration of mobile applications into education was implemented within the disciplines

"Psychology of the professional activity of the individual", "Electronic resources in professional activity", "Foreign language", "Digital technologies in education". Special testing was developed and carried out, including 15 tasks. Auxiliary methods of computer data processing were also used: data presentation in the form of mind maps, tables, diagrams, graphs. 90 students of the second or third year of the bachelor's program 37.03.01 Psychology were involved. When characterizing the relationships of the features under consideration, nonparametric statistical criteria are used, in particular, the Pearson's chi-square coefficient – $\chi 2$.

3.2. The base of research

The main goal of the experiment was to test the potential of mobile applications in the context of the new epidemiological situation to form intercultural competence of students.

Achieving the goal and objectives of the research becomes possible due to the involvement of teachers of related disciplines in the choice of mobile services and platforms (in particular, "Psychology of professional activity of the individual", "Electronic resources in professional activity", "Foreign language", "Digital technologies in education"), the inclusion of all digital resources and files in a single MS Teams space. The average age of the respondents was 21 years (78 % of girls and 12 % of young people). 90 students of the second and third courses were involved.

With the help of the results of the entrance test, it was possible to collect the required initial data on students. The sample was not random. To fulfill the rules of probabilistic selection, the same teachers supervised the practical activities of all students. They also formulated systems of educational tasks, directed intercultural interaction in the process of solving professionally oriented tasks by students using MS Teams tools:
- creating teams and channels, inviting participants;
- support for intercultural and multilingual activity in the chat,
- placement of educational materials;
- holding an online seminar or lecture;
- screen sharing, meeting recording, recording storage;
- conducting an interactive lesson in MS Teams;
- creating homework, checking, grading; test creation.

The integration of mobile applications into training was carried out in the same classrooms, using the same equipment and software.

The materials for the test were developed by the authors in accordance with the current standard of higher education in the field of study.

3.3. Stages of research

The study was carried out in three stages.

At the preparatory stage of the experiment, various mobile applications for multilingual interaction at a distance (HelloTalk, MS Teams, Zoom, Skype, Tandem, HiNative, Busuu, Duolingo, Memrise, etc.) were considered and analyzed.

To obtain up-to-date information about changes in the level of skills that make up the essence of intercultural competence, empirical methods were used (observation, analysis of the results of working with mobile applications and MS Teams). The integration of mobile applications into education was implemented within the disciplines "Psychology of the professional activity of the individual", "Electronic resources in professional activity", "Foreign language", "Digital technologies in education" of the bachelor's program 37.03.01 Psychology.

The didactic potential of m-learning methods and tools for systematic professionally oriented student learning was studied. Materials of specially organized testing were used to evaluate the input conditions.

For the test-paper, the student could get from 0 to 45 points. According to the measurement results, the levels were determined as follows: from 45 (inclusive) to 39 points – the value of "high", from 38 (inclusive) to 24 – the value of "average", for other cases – "low".

Thus, it was possible to collect data on 90 students, from which the experimental (45 students) and control (45 students) groups were formed. The sample was not random. The experimental group included 78 % of girls and 12 % of young people.

The second stage of the study was devoted to determining the directions for the purposeful inclusion of work with mobile applications and devices in the educational process of the university.

The third stage of the study covers experiential teaching and the use of mobile applications in learning to form professional intercultural competence of students.

4. Results
4.1. Clarification of the essence of the basic concepts

In the framework of the present research, mobile learning is understood as learning supported by mobile devices. The didactic process implemented by means of m-learning reveals the relationship between cognitive activity, intercultural communication and foreign language competence. Intercultural competence is a set of knowledge, skills and abilities common to all participants in information interaction, as well as a positive attitude towards the presence of different ethnic and cultural groups. It implies a willingness to conduct a dialogue based on knowledge of one's own and other cultures, the ability to navigate in time and space of a partner, his social status, intercultural differences, the use of various language forms and information technologies.

The formation of intercultural competence of students through the purposeful integration of the work of students with m-learning technologies into the educational process of the university involves:

- support for a special psychological attitude towards cooperation with representatives of another culture;
- development of abilities to overcome social, ethnic and cultural stereotypes;
- mastering a set of communication tools and supporting their correct choice depending on the communication situation;
- observance of etiquette norms in the process of multilingual virtual communication.

In accordance with these directions, the content was determined for each level of formation of intercultural competence of students (described in paragraph 4.3.2.).

The following ways of forming intercultural competence are applied in the work: educational and cognitive activity in the information environment to understand the features of one's own and another's culture; situational business communication and replenishment of knowledge about other cultures; professional orientation and the acquisition of knowledge about the socio-cultural forms of professional interaction in a foreign culture.

The first key idea for the effective use of mobile applications in a foreign language teaching and the formation of students' intercultural competence is precisely the targeted integration of students' work with m-learning technologies into the educational process of the university.

Directions for the implementation of the key idea: leveling the knowledge and skills of students in the field of using mobile applications; organization of practical activities within the framework of various modules (disciplines).

4.2. Stages of systematic purposeful work on the use of mobile applications to form intercultural competence of students

Next, we describe the features of purposeful work with m-learning technologies to form intercultural competence of students. The didactic potential of mobile applications is revealed on the materials of a specially developed module "Mobile Technologies: Opportunities to Support Online and Offline Learning".

The content of intercultural interaction includes groups of mobile applications that can be used to form the professional competencies of sought-after specialists of the future: instant messengers, mobile versions of social networks, mobile versions of cloud services; QR code scanners, analytics and statistics apps, flash card mobile apps.

At the first stage, students get acquainted with distance learning platforms, their functionality and limitations. It is advisable to include the named module into the composition of a related discipline, for example, "Digital Technologies in Education". It was within the framework of this module that the MS Teams platform was reasonably chosen to integrate various mobile learning resources: chat bots, calendars, Trello, Stream, OneNote Class Notebooks, MindMeister, OpenLearning, Kahoot, Nearpod, Quizlet, and Flipgrid, etc.

Further, educational group activities were organized directly within the framework of the discipline "Foreign Language". The groups were formed from students with different levels of knowledge of mobile applications. In order for students not to deviate from the main task, which is to equalize knowledge and skills in the use of mobile devices for foreign language communication, the groups were given a task. It consisted of two parts. The first part is obligatory. It lists mobile apps to learn and foreign language tasks to complete with them. For example, organize a group video discussion of a situation of professional communication, consolidate grammatical skills, expand vocabulary and work out pronunciation. The second part is variable. Students themselves choose an application that was left unattended in the main part, or explore a "new" aspect of its work. For example, travel planning, finding an online tutor, compiling a menu for a dining room, etc.

At the second stage of including work with mobile applications in the educational activities of the university (and in the teaching of a foreign language), a public defense of group projects was organized. In particular, one of the groups presented the presentation "My Holidays with TripIt". This English-language service allowed them to create a route, save information about departures, mark all the necessary places on the map and indicate upcoming meetings. Notifications about changes in flight status, maps of airports and terminals, and points of interest were also provided.

The integration of mobile applications at the third stage was implemented in the distance learning format for a traditional lesson. At the update stage, the Nearpod application was used, CoachBot for motivation, Trello for learning new material, MindMeister for systematization, Quizlet for consolidation, and the Assessment service for control.

Further, mobile applications were tested on various types of learning activities in online and offline formats. The search for information in a foreign language was supported by such mobile applications as iTranslate, ABBY Lingvo, mobile versions of digital libraries. The selection and brief review of sources was accompanied by work with Coursera, Google Classroom, Moodle, Stepik. Participation in webinars, courses to improve the skills of foreign language and intercultural communication took place on the MS Teams platform itself. Group discussion of the task, problem, plan, results of work is implemented through Trello, Skype, instant messengers.

The second key idea of the study is that the student is an active participant at the stage of a reasonable choice of the mobile application itself to support intercultural communication. In other words, the result of the cognitive activity of students in the module "Mobile Technologies: Opportunities to Support Online and Offline Learning" should be a case of mobile applications. The purpose of the cases: firstly, students demonstrate their competence in the field of digital technologies; secondly, they are preparing the basis for a model of personalized foreign language teaching. Further, from this application case, students independently choose services to perform a particular task in the conditions of the educational situation proposed by the teacher.

For example, what mobile application to use while sending messages and announcements to participants in intercultural interaction; creating test tasks/open type; plan work; discussing options for solving the problem of dialogue of cultures; using virtual notebooks to exchange notes, materials and feedback, as well as collecting and exchanging data in the process of multilingual communication.

The fourth stage of the integration of mobile applications into the educational process of the university includes the application of the acquired knowledge in the course of educational practice. At this stage, the student himself acted as a mentor, but if necessary, he could seek advice from a university teacher. Such appeals arose when representatives of educational institutions and parents of schoolchildren expressed doubts about the advisability of using mobile devices in communication.

However, the distance learning format removed a lot of issues in this direction. Other difficulties were associated with the organization and management of multilingual communication among schoolchildren with very different levels of training, knowledge of grammar and vocabulary. Mobile applications allowed in a playful way to relieve emotional stress from multiple repetition of phrases, the study of norms and rules, word-formation mechanisms. For example, the Duolingo resource has become available to owners of mobile devices. In the process of practicing in a foreign language, students used the following functionality of the application: reminders in the form of a tone scale; special points – lingots for free additional lessons; communication in a convenient chat; sorting material for each user.

The fifth stage of integration is the self-presentation of students with the help of mobile applications to potential employers. For this, online meetings, seminars and round tables were

organized, within which students conducted master classes on the possibilities of m-learning technology (timelines, planners, calendars, questionnaires and virtual sticker boards).

4.3. Experimental Evaluation
4.3.1. The ascertaining stage of the experiment

To assess the input conditions, materials of specially organized testing were used. For each completed of the first 10 tasks, the student could receive a maximum of 2 points. The remaining tasks were evaluated out of 5 points.

1. A task for understanding the content of the text, followed by the choice of the correct answer from several proposed options. For example, read the text and choose one of the three sentence completion options that best suits you.

2. Learning situation: "Alexander from the 6th grade went on an autumn vacation with his parents to the capital of Great Britain. On the first day of their journey, they decided to visit the Palace of Westminster. On the way to the palace, Sasha and his parents decided to have a bite to eat at the West Garden restaurant. Sasha's father only learned German at school, and his mother remembers only "window" from English words. Help Sasha order 3 mashed potatoes with sausage and 3 cups of tea. Write a proposal with an order for the waiter (3 servings of mashed potatoes with sausage and 3 cups of tea, please).

3. Learning situation: "After a delicious lunch, the whole family reached the Palace of Westminster. Sasha was so carried away by the excursion that he lost sight of his parents. The charge of phone battery was low after a lot of photos, then the young man decided to go to the exit and wait for his parents there. The palace has a rather complicated design." Help Sasha ask the employee how to get to the exit of the building (Hello! Can you help me? What is the way to the exit?).

4. Learning situation: "When Sasha waited for his parents, they decided to take a taxi together. The travelers got into the famous London cab, and the driver asked them: "Where do you want to go?" Help Sasha tell the driver that they need to be taken to the Metro Hotel on Main Street (Hello! Could you drive us to Metro hotel on Main street, please)?

5. Learning situation: "At the hotel, Sasha met Mary, who came from France. They struck up a conversation. Mary was very interested to know: where Sasha came from, where this place was, what it was famous for? Help Sasha tell about his hometown Kirov. (I`m from Kirov city. It`s located in central Russia. It is famous for Dymkovskaya toy).

6. Read the text, paying attention to the gaps in it, and choose the most appropriate word for each gap.

7. Task for word formation. For example, form verbal nouns, adjectives and adverbs.

8. Listen to the principal's conversation with one of the parents and fill in the gaps in the sentences.

9. Task for understanding the content of texts with the choice of the correct answer from the proposed ones. For example, listen to the mini-dialogues and choose one of three answers to a question.

10. The task of correlating questions and speakers. For example, listen to the opinions of five people about what they do not like when people around them use mobile phones, and match the speaker with what he says.

11. Assignment for an abstract reduction of up to 50–100 words of a text on psychological and pedagogical topics. Read the text and answer the question: what is the main idea of the text?

12. Write an essay on the topic "Life without TV: pros and cons." Point out the advantages, disadvantages and express your own opinion.

13. Interview with the examiner about the student's scientific activities and interests. Orally answer the examiner's questions.

14. Monologue-description of a picture of pedagogical subjects. For example: "Describe the proposed photo, in the description you need to answer the following questions ..." Three questions are offered for each photo.

15. Dialogue with the examiner in continuation of the discussion of the educational process depicted in the picture. The examiner asks oral questions based on the photo.

Thus, the maximum possible score was 45.

For the test-paper, the student could get from 0 to 45 points. According to the measurement results, the levels were determined as follows: from 45 (inclusive) to 39 points – the value of "high", from 38 (inclusive) to 24 – the value of "average", for other cases – "low".

4.3.2. Forming stage of the experiment

This stage of the experiment was devoted to the design and implementation of the process of targeted inclusion of communication with mobile applications and devices in the work of the university. There was a choice of a digital platform into which it will be possible to integrate the relevant resources here; create effective conditions for the conscious active development of terminology, lexical-syntactic and grammatical features; for individual and group activities with oral and written texts, simulation of communication situations.

The components of intercultural communicative competence, directions and ways of supporting multilingual communication were identified. Mobile applications were used both as a means of activating cognition and as a means for semantizing lexical material and its application. The m-learning services were included in solving the problems of intercultural communication, and in explaining the rules, and in case of situational illustration, and for foreign language communication.

As noted above, the levels of formation of intercultural competence of students were determined.

High level: in multilingual communication, the student shows the ability to be flexible, tactful, humane; patient with new ideas and perspectives; ready to accept change, resourceful in solving problems and overcoming crises. The student shows activity and desire to communicate with people from other cultures, interest in culture and cultural differences. There is no ethnocentrism. He possesses a wide range of communication skills in the information environment, which are important in intercultural communication.

Intermediate level: in multilingual communication, the student does not always show the ability to be flexible, tactful, humane; most often conservative and not ready to accept qualitative changes in a multicultural environment; finds a solution only to the most acute problems in the dialogue of representatives of different nations. The student communicates with people from other cultures, is interested in cultural differences, but only under the influence of circumstances. Owns a range of communication skills in the information environment, the most important in intercultural communication.

Low level: in multilingual communication, the student may be tactless; impatient with the ideas and views of other cultures; often unwilling to accept change; not tuned in to finding solutions to problems and overcoming crises. The student does not show activity and desire to communicate with people from other nations, peoples. There is ethnocentrism. The range of communication skills in the information environment that are important in intercultural communication is very limited.

The students of the control group studied the topics of the disciplines "Psychology of professional activity of the individual", "Electronic resources in professional activity", "Foreign language", "Digital technologies in education" according to the work program in the traditional way through a series of lectures and seminars, with the support of multimedia presentations and information resources the Internet.

Table 1. The results of the level of formation of intercultural competence of students

Level	Groups			
	Experimental group (45 students)		Control group (45 students)	
	Before experiment	After experiment	Before experiment	After experiment
High	4	18	5	8
Intermediate	23	19	22	21
Low	18	8	18	16

4.3.3. Control stage of the experiment

After the inclusion of purposeful work with mobile applications in the system of university students training, another test was carried out. The questions for the test were designed in accordance with the principles described earlier. Information about the test results before and after the experiment is presented in Table 1.

The following statistical hypotheses were accepted:

H0: the level of formation of intercultural competence of students of the experimental group is statistically equal to the level of the control group.

H1: The level of the experimental group is higher than the level of the control group.

In the online resource http://medstatistic.ru/calculators/calchit.html. the values of the criterion were calculated before ($\chi 2$observation 1) and after ($\chi 2$observation 2) the experiment. For $\alpha = 0.05$, according to the distribution tables, $\chi 2$crit is equal to 5.99.

Thus, we get: $\chi 2$obs.1 < $\chi 2$crit (0.133 < 5.99), and $\chi 2$obs. 2 > $\chi 2$crit (6.61 > 5.99). Therefore, the shift towards an increase in the level of formation of intercultural competence can be considered non-random. In other words, practical work to involve students in active group interaction on the project, educational practice, professional self-presentation and foreign language communication with the support of mobile technologies, helps form demanded intercultural competence among students. Corresponding changes in the pedagogical system are not accidental but have coherent pattern.

5. Limitations

The sample of students was not random: the experimental and control groups were formed in such a way as to guarantee the presence in each group of the same skills and personality traits that form the basis of intercultural competence, their identical distribution.

In the course of diagnostics, the results of the input control measure were taken into account. The selection of participants for the experiment and the sample size are justified by the specifics of the study, the volume of fundamental theory and the variety of seminars in the disciplines "Psychology of professional activity of the individual", "Electronic resources in professional activity", "Foreign language", "Digital technologies in education". In addition, the use of mobile technologies for educational purposes is included in the training program for a limited number of specialties. Throughout the experiment, practical activities in solving problems of intercultural communication, supported by mobile technologies, were carried out by the same teacher, using the same software equipment in special classrooms. During the implementation, the main principles and stages of the development of an educational project, the functionality of mobile technologies were taken into account.

6. Discussion

It should be noted that at the preparatory stage (before the purposeful integration of mobile applications into the educational process), it is necessary to organize consultations with participants on technical issues: the general procedure for individual and collective activities with mobile applications; work in MS Teams and possible network interaction problems; graphical user interface and basic tools; creating a new meeting and team; regulations for working with the selected mobile application (purpose, functionality, application in theory and practice); demonstration and oral presentation in an online format.

Further, general organizational aspects should be disclosed: the goals and objectives of using mobile applications in this topic, the role of this topic in the structure of the academic discipline, the practical significance of the mobile application used, the timing of the study, forms of information interaction, options for consulting and attracting other specialists. In the course of providing a theoretical block of information (vocabulary, grammar), electronic resources and references to sources, the material should be presented logically and consistently in accordance with the specifics of the training. At the same time, the use of mobile applications in teaching (foreign language, psychology, pedagogy, etc.) does not set the task for the teacher to fundamentally change the existing teaching technologies. Taking into account the described factors is necessary to adjust the didactic process in accordance with the spread of COVID-19 and the format of online learning.

Performing a quantitative analysis of the above results, we can conclude that after the completion of the experiment, 40 % of the students in the experimental group had a high level of indicators reflecting the degree of formation of intercultural competence (18 participants out of 45), while initially this percentage was 9 % (4 students out of 45). The number of students with a "low" level has significantly decreased from 40 % to 18 %.

In the control group, changes in the "high" level are not so significant (from 11 % to 18 %). The indicator on the level of formation "low" changed from 40 % to 36 %. So, the dynamics by levels in the control group is also present, but it is less significant.

The obtained results expand and supplement the conclusions of Ivanchenko D. A. about the potential of mobile devices for the educational space of the university (Ivanchenko, 2014). In addition, it was possible to confirm the position of the works of R. Günday, Y.T. Çamlioğlu regarding the didactic capabilities of mobile applications for organizing multilingual communication (Günday, Çamlioğlu, 2016). The research materials comply with the principles of the UN and UNESCO regarding the need to develop linguistic diversity, promote the dissemination of creative ideas, and include digital resources in education. In addition, the practical results of the study can be applied in the framework of international events to introduce new approaches to the development of foreign language communication (for example, in trainings, conferences for the exchange of experience).

7. Conclusion

During the research, the following didactic possibilities of mobile applications for the formation of intercultural competence were noted: activation of activity, cognitive interest, personalization, intercultural networking, support for scientific adaptation, professional self-determination, etc. However, mobile learning problems were identified: rationale for choosing a mobile application, correlating it with the didactic goals and needs of students, the requests of potential employers; organization of systematic evaluation and control; maintaining a balance in the principles of visibility, scientific and accessibility.

The conditions for the effective use of the didactic capabilities of mobile applications for the formation of intercultural competence are:

- a comprehensive study and analysis of m-learning technology to understand the essence, problems and prospects in learning;

- in the modern system of digital education, it is necessary to widely use such didactic capabilities of m-learning technology as the activation of cognition, personalization, intensification, adaptation to the professional aspirations of each student, interactivity, the possibility of distance interaction;

- mobile applications should be used along with traditional learning tools to build intercultural competence.

For the effective integration of mobile applications into learning and the formation of intercultural competence, the authors identified the following pedagogical conditions: purposeful nature of work with m-learning technologies; collaboration of teachers of related disciplines; active participation of the student at all stages of the selection and use of the mobile application; creation of cases of mobile resources for educational activities, scientific and intercultural cooperation, foreign language communication, professional self-realization. The proposed ideas were implemented at the following stages of integration: when defining the content of a specially designed module "Mobile Technologies: Opportunities to Support Online and Offline Learning"; in organizing group work and public defense of projects; in the course of a traditional classroom lesson; to apply the acquired knowledge in the course of educational practice; for self-presentation of the student in front of potential employers.

In the experimental work, thanks to mobile applications, communication skills, knowledge of grammar and vocabulary were developed; a comprehensive supply of educational material of various types and in different formats of training was organized. In other words, systematic work has been done on the formation of professional foreign language and intercultural competence by means of m-learning.

As guidelines for teachers planning to include technology in the learning process, we note: the need to regulate the time of using mobile applications; alternation of activities, traditional

methods and means of training with innovative ones; instructing students on how to work with services. Thus, it is important not only to form professional intercultural communicative competence, but also to teach students objective analytics and evaluation of information coming to them through mobile applications. The described factors of integration of mobile applications make it possible to widely use the m-learning technology in teaching at a university. This contributes to the optimization of the educational process, fills it with information, involves students in it and effectively influences professional self-realization.

So, it is advisable to use mobile applications as an auxiliary tool for organizing intercultural communication in the online interaction mode. The results of the study can serve as a basis for further applied research in the field of the formation of intercultural competence of students by means of innovative digital technologies.

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