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Promoting Augmented Reality Technology in Teaching English Language to Non-Linguistic Students in Higher Education

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Abstract

The aim of this paper is to examine the advantages of using IT in English language learning process in higher education. The study relevance stems from the fact that the latest information technology is steadily entering the higher education. The researchers' attention is focused on the implementation of the Augmented Reality technology and Quick Response codes in teaching English languages to non-linguistic students. The paper reviews recent researches related to the problem discussed. The authors of the article use several scientific methods such as analysis of scientific and methodological literature on the use of ICT in learning process, observation and experiment. The tools of information technologies mentioned above help to form students' professional foreign-language competence, to improve motivation and performance. The pedagogical experiment was conducted to show the effectiveness of these tools. 42 students of the faculty of the Information Systems and Technologies of The Povolzhsky State University of Telecommunications and Informatics took part in the conducted experiment. They were divided into three groups of 14 learners; one group is experimental, two others are control groups. The students of the control groups studied the English language according to the traditional methodology; the students of experimental group used the IC technologies at their classes. Motivation, the interest in learning process and the students' professional foreign-language competence were higher in experimental group. The results indicate the effectiveness of using ICT in teaching the English language for non-linguistic students. The experiment results would be served as useful material for teachers and university administrators. Teachers' training programs on ICT use and educational software for English language teaching can be developed according to the results of the study.

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Keywords: augmented reality, QR codes, professional foreign-language competence, motivation, higher education, information technologies, non-linguistic students.

1. Introduction

The use of advanced technologies in the field of education is a key factor in the development of intellectual society. The modern digital entertainment environment is a serious competition for traditional educational technologies (Alhubaishy, 2021). In order to involve students in the educational process, in particular, in this article we will consider English language education for students of technical universities. Specialists in the field of pedagogy, psychology and linguistics are in the search for new effective mechanisms for perceiving information. University teachers are expanding the possibilities of higher vocational training with elements and tools of innovative and information and communication technologies (Bonner, 2018). Continuous modernization and updating of educational content by means of modern technologies, training of highly qualified specialists is the primary task facing universities and teachers, in particular, aimed at solving applied problems and increasing the efficiency of education (Palaigeorgiou, 2017; Wu, 2013). Information and communication technologies make it possible to increase the efficiency of education and accelerate the learning process, make it practical and professionally oriented (Akçayır, 2017). Research in the implementation and application of AR technologies in the educational process shows the recognition of its advantages over traditional teaching, due to the fact that PowerPoint, video, is gaining momentum as an effective form of the pedagogical process. (Yang, 2017). The use of modern learning tools is an essential condition for enhancing the training effect (Karthiga, 2019).

The introduction of information technologies and their multimedia applications in foreign language education programs contributes to the more successful formation of foreign language competence (Varnikova, 2011).

One of the most progressive directions in training is augmented reality technology. It arouses the interest among foreign researchers and domestic authors: H. Kaufmann, R. Kaiser, K.N. Reskov, A.V. Grishkun, I.A. Otkupshchikova, A.A. Kuprienko, M. Papp, Yu.A. Kravchenko, A.A. Research on AR in education and it demonstrates a positive effect on students learning outcomes and motivation (Cecilia, 2021).

The main task of such a mechanism is to attract the interest of students in the subject of study, to create conditions for sustained internal motivation and to ensure an effective educational process (Kauffmann, 2006). Capabilities of Augmented Reality technology may make classes more engaging and information more apprehensible (Singaravelu, 2020).

The relevance of this scientific research is caused to the fact that the latest information technologies are sustainably included in the higher education system. The formation of students' foreign-language competence in the professional sphere should be optimized by integrating ICT tools into the learning process.

The aim of our study is to show the benefits of using augmented reality tools in the process of teaching English to students of technical specialties.

To achieve this goal, the following tasks must be realized:

- to study the theoretical foundations should be studied of augmented reality technology;
- to identify the advantages of this model in the process of teaching English in a technical university;
- to study and describe the ways of implementation augmented reality technology in order to form foreign-language competence of students in the professional sphere;
- to prepare recommendations on the use of augmented reality technology tools in English classes at the university.

The scientific novelty of this research is to confirm the effectiveness of the use of augmented reality technology when teaching English at a technical university, as well as to develop recommendations for the use of AR tools.

Beginning to apply augmented reality technologies, we are faced with a problem related to the lack of methodological recommendations and developments in the field of application of this technology.

Some researchers believe that the concept of "Augmented reality" (AR) was invented by a scientist from Boeing and described the concept of this technology. Another founder of the development of Augmented reality is Morton Heilig in 1957 (Sünger, 2019), the first developer of virtual reality technology, the creator of Sensorama, the world's first virtual simulator. The technology was dedicated to education. In preparing the patent documents, Morton Heilig gave a number of reasons for the need for his invention for educational purposes.

Subsequently, the following researchers studied this technology, its features and methods of application; R. Azuma, F. Kisino, T. Coldell, A.S. Konushin, P. Milgram, S.K. Ong, V.R. Roganov, M. Sairio, B.Cheng, M.L. Yuan and others.

Augmented reality is based on virtual reality, a digital simulated environment. When these two approaches are combined, a hybrid reality is formed. Augmented reality technology allows you to introduce, add parts of virtual information to the real human world. Augmented reality implies the interactive assimilation of the material, the formation of the necessary competencies in future specialists using cutting edge technologies (Karacan 2021, Cipresso, 2018). It is a mediator between the actual and artificially created worlds, helping to form one whole. This technology combines the original real-world data and additional data that are embedded in the subject's perception field. Visual, auditory, tactile, somatosensory and olfactory receptors are tools for enhancing the effects of this technology. For example, we have the task of modeling the language environment for English learners, we are in a certain room with installations of various parts of the city, we aim a smartphone camera or a tablet to the attraction, and we can see on the screen what a building or space looks like, and through the speaker we hear the speech of native speakers. Thus, students immerse themselves in augmented reality and an artificially created language environment (Makolkina, 2019).

Augmented reality technology is based on special software and special devices that operate this technology. Using such devices, graphic objects are superimposed on the translated real image. The Augmented reality environment has some features, for example; it combines real and virtual objects, the interaction takes place in real time, technology is implemented in three-dimensional space (Kauffmann, 2006; López-Belmonte, 2020; Panagiotidis, 2021). Devices using this technology run on special software. (Liao, 2020) The corresponding software should read a special label contained in the program code; this allows you to play an additional layer of information on the screen. Often, a simple one-color picture is used as a marker (Jakovlev, 2013).

2. Materials and methods

Theoretical analysis, generalization of scientific literature on the problems of using augmented reality technology in learning process and comparative analysis were used in the study.

Immersive technologies presented in the form of augmented reality are relevant and effective pedagogical tools, contribute to the formation and development of critical and spatial thinking in students at all levels of study, synchronizing the received information by integrating the acquired knowledge with real space and time. By visualizing objects students can manage and explore the subject in detail from different sides, scaling it, which in real conditions during classrooms without the use of technology is quite problematic (Vazquez-Cano, 2020).

Due to globalization, the task of higher education is to train a competitive specialist in a certain professional field. Such institutions should develop not only the necessary professional skills, but also students' foreign-language competence. Foreign language teachers need to introduce augmented reality technology into the educational process. This technology involves students in the process of English communication and forms foreign-language professional competence (Nabokova, 2019).

To achieve the goal set in this article, we conducted a pedagogical experiment. The experiment is aimed to update the use of augmented reality technologies when teaching English to students of technical specialties. The students of the faculty of Information Systems and Technologies at the Volga State University of Telecommunications and Informatics participated in our experiment. The empirical group consisted of 42 students. The main areas of work of this

specialty are: design of intelligent information systems; development of computer-based training information technology; real-time systems; design and modeling of computer networks, etc. The experimental group consisted of 14 students, the rest were participants in two control groups.

At the beginning of the experiment, the professional foreign-language competence rate, interest and involvement in the process of learning English were established, the motivation of students was determined. All the highlighted indicators in the experimental and control groups at the initial stage were approximately the same. See Figure 1.

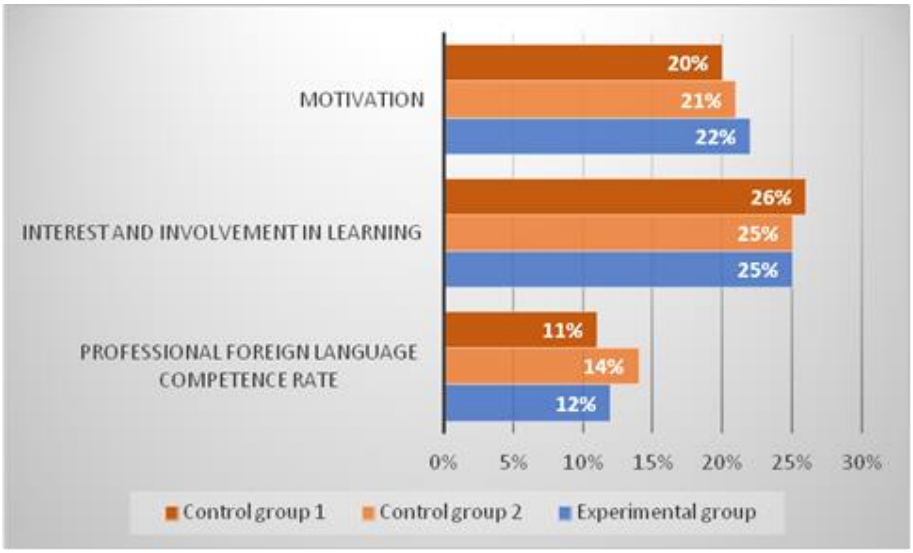

Fig. 1. The indicators at the beginning of the experiment

During the experiment, students of our control groups studied English on the basis of the traditional teaching methods for students of non-language universities. The students of the pilot group were offered augmented reality technology tools in accordance with the training profile, along with traditional teaching methods. Professionally-oriented English language education for students of specialties Information systems and technologies are taken into account with the specifics of professional vocabulary and terminology; features of vocabulary-grammatical and syntactic constructions; selection of language material, the selection and preparation of texts for analytical reading; creating a language environment.

In English classes, students of the control and the experimental groups learned the same material. They studied vocabulary on their specialty; read and retold professional texts; simulated business communication situations; worked on various projects in English. The volume of material and the time for study and preparation were the same in all groups. In addition to the above, the experimental team worked on a project to create a virtual presentation of the university in English using the Unity and Augmented reality application and used QR code technology to access authentic content in English.

Immersion in professional terminology took place through the work on the Augmented reality project, the students of the experimental group took a certain area to host the project, then using the packages for creating 3D computer graphics Cinema4D and Blender created the necessary objects and transferred them to Unity, then created a scene in Unity using these 3D objects. Including elements from the professional interests of future specialists in the process of teaching a foreign language, we achieve high motivation and deep involvement of students in the study of English, which in turn forms a foreign-language competence and competitive advantage. The Unity environment allows specialists from different fields to develop VR/AR applications, run projects using a catalog of various assemblies and tools.

In the process of working on their project, the students of the experimental group got acquainted with educational materials in English, which consist of step-by-step instructions, various topics, detailed additional lessons. Based on the results of their work, we concluded that

this type of work contributed to the expansion of vocabulary in the specialty and the formation of skills in foreign language competence.

In addition, in the experimental group, we used QR code technology in English language classes. In the process of teaching foreign languages using QR codes, we can encode and decode information for individual or group work with students. We consider QR codes as a pedagogical tool at modernizing the learning process and expanding competencies in the context of the use of computer and digital technologies.

The working hypothesis of our experiment is the use of QR codes in order to increase the level of knowledge among students in the field of Information Technologies. The basis was the textbook Professional English in Use ICT – Cambridge University Press, Unit 26 "Internet Security," which consists of parts: 1) Internet crime, 2) Malware: viruses, worms, trojans and spyware, 3) Preventive tips (Esteras, 2007). Together with the traditional pre-text, text and post-text work, with the help of QR codes, we supplemented the lesson with a professional-oriented video on the topic.

1. Internet crime – The Five Laws of Cybersecurity by Nick Espinosa. See Figure 1.

2. Malware: viruses, worms, trojans and spyware – What's the Difference: Computer Virus vs Malware, vs Spyware by Thio Joe. See Figure 2.

3. Preventative tips. How to Protect Your Computer From Viruses and Hackers by ThioJoe. See Figure 3.

Scheme 1.

At the end of the class training sessions using AR tools, our experimental group and two control groups passed an oral survey in order to determine the level of formation of knowledge and skills on topics completed during this period. The survey showed that students who had the opportunity to use AR tools, better learned language material and expanded their vocabulary on the topic of Internet security, grammatically correctly and logically built statements without phonetic errors.

During our scientific experiment, we proved that the use of augmented reality tools such as Unity and QR codes contribute to the formation of vocational-oriented skills, competencies and an increase in the level of assimilation of language material. See Figure 2.

The following evaluating criteria for the tasks were used in the study. Evaluating criteria for the translation and understanding a professionally oriented text:

- less than 3 points = unsatisfactory (2) – the essence of the translation is weakly related to the topic, the volume of translation is up to 65 %, there are noticeable violations of logic and deviations from the format, lexical, grammatical and spelling errors make it difficult to understand the text, less than 40 % are used active vocabulary;

- 3-5 points = satisfactory (3) – the translation as a whole corresponds to the original, but the ideas are poorly expressed, no more than 75 % of the text translated, grammatical, lexical and spelling mistakes do not greatly impede understanding, but speech is extremely primitive, less than 55% of the active vocabulary is used;

- 6-8 points = good (4) - the translation corresponds to the original, no more than 85 % of the text is translated, statements are generally logical, but there are some grammatical, lexical and spelling errors that do not impede understanding, speech is primitive, less than 65 % of the active vocabulary is used;

- 9-10 points = excellent (5) – the translation fully corresponds to the essence of the original text, translated at least 95 % source text, the task corresponds to the format completely, logically, grammatically and lexical means are diverse, more than 85 % of the active vocabulary is used.

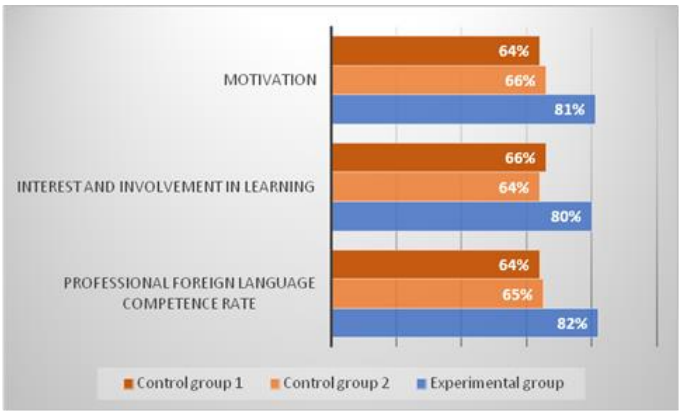

Fig. 2. The indicators at the end of the experiment

Evaluation criteria for the project:

- less than 3 points = unsatisfactory (2) – the student coped weakly with the communicative task, hardly understands questions, in more than 70 % of cases he cannot answer or answers inadequately, his speech is poor and incoherent, he cannot adequately formulate his thought, the vocabulary is limited, a large number of lexical, grammatical and phonetic errors, significantly complicating understanding, the slow pace of speech interferes with the coherence of statements. The written text of the presentation contains some errors that slightly hinder understanding. 30 % of active vocabulary is used;
- 3-5 points = satisfactory (3) – the student did not fully cope with the communicative task, understands examiner's questions, but in more than 30 % of cases cannot give an adequate answer, speech is not quite coherent, has difficulty formulating phrases, vocabulary the stock is limited, lexical, grammatical and phonetic errors are not much make it difficult to understand, the pace of speech is slow, which does not greatly interfere with connectedness statements. The written text of the project does not contain errors. In oral speech 45 % of the active vocabulary is used;
- 6-8 points = good (4) – the student coped with the communicative task, understands the examiner, but experiences slight difficulties in answering his remarks, the speech is quite coherent, it can be understood to formulate your thought, but allows grammatical, lexical and phonetic errors that do not impede understanding, the pace of speech is even. The written text of the project contains no errors. 60 % of the active vocabulary is used;
- 9-10 points = excellent (5) – the student coped with the communicative task, understands the examiner and adequately responds to all his questions, clearly and clearly expresses his thought, speech coherent, reasoned, the number of grammatical, lexical and phonetic errors are minimal and do not impede understanding, the rate of speech is fully consistent intended language level for this group. The written text of the project hasn't mistakes. At least 85 % of the active vocabulary is used.

3. Results

To indicate statistically significant difference in our experiment the $\chi 2$ (chi-squared) Pearson test was used. We accepted two hypotheses: H0 states that the results of learning process in the experimental group do not differ statistically from the results of the two control groups. H1 states that the results of learning process in the experimental group are higher than that of the control groups.

The students' results before and after the experiment are presented in Table 1 and Table 2.

Table 1. The results of reading and understanding the text

Rating	Experimental group (14 st.)		Control Group №1 (14 st.)	
	before exp.	after exp.	before exp.	after exp.
5 (excellent)	2	9	2	4

4 (good)	4	4	4	4
3 (satisfactory)	6	1	6	5
2 (unsatisfactory)	2	-	2	1

Using online resource http://medstatistic.ru/calculators/calchit.html the values of the criterion before and after the experiment were calculated. In experimental group the value of the criterion $\chi 2 = 10, 025$; the critical value $\chi 2 = 7,815$ at the significance level $p = 0,05$. Statistical difference is significant at $p < 0,05$. Thus, we get statistically significant difference $p = 0,019$. The statistical difference in control group №1 is not significant, $p = 0,780$ ($0,780 > 0,05$)

Table 2. The results of project

Rating	**Experimental Group (14 st.)**		**Control Group №2 (14 st.)**	
	before exp.	after exp.	before exp.	after exp.
5 (excellent)	2	11	2	2
4 (good)	5	2	5	6
3 (satisfactory)	5	1	5	5
2 (unsatisfactory)	2	-	2	1

According to the results of project the value of the criterion in experimental group $\chi 2 = 12,183$; the critical value $\chi 2 = 11,345$ at the significance level $p = 0,01$. Statistical difference is significant at $p < 0,01$. Thus, we get statistically significant difference $p = 0,007$. The statistical difference in control group №2 is not significant, $p = 0,936$ ($0,936 > 0,01$).

The results obtained allow us to assert that H1 is correct, professional foreign language competence is higher in experimental group than that in control groups.

Completing our experiment, we compared the results of the training process in experimental and control groups and came to the conclusion that the use of augmented reality technologies in English language classes with students in the field of information technology at a technical university:

1. Contributes to the effective development of foreign-language competence;
2. Complements the possibilities of traditional educational and methodological complexes in the English language;
3. Increases motivation and forms a sustained interest among modern students in the development of professionally oriented English;
4. Promotes the development of neural networks and models the cognitive activity of students.

To realize the main goal set in our research, we studied the theoretical foundations of augmented reality technology and revealed the advantages of this model in the process of teaching English at a technical university. In addition, we studied and described ways to introduce augmented reality technology in order to form the foreign-language competence of technical

university students in the professional field. We considered how to use augmented reality technology tools in English classes at a technical university.

4. Discussion

Augmented reality, as one of the innovative learning technologies, is aimed at motivating students to gain new knowledge, develop skills for independent work and helps to unlock creative potential, therefor instilling interest in the study of the subject. The main task of AR applications in the context of training is to combine modern virtual educational resources with a real learning environment. Augmented reality technologies provide the teacher with limitless opportunities for spatial visualization, the development of training courses and testing of formed knowledge and skills in students. In modern realities, the acquisition of virtual reality glasses is not very costly, there are inexpensive models that have proved the effectiveness of use in an educational context. Based on the tasks and goals of the discipline being studied, the teacher chooses specialized software: advanced computer technologies such as 3D modeling, multimedia, tracking and registration in real time, projection video mapping, marks or markers, and other new tools (Xinqi, 2018).

Augmented reality implies the interactive assimilation of material, the formation of the necessary competencies among future specialists in the means of high-tech technologies. The undoubted advantage of using AR technologies is the use of smartphones and portable devices in various fields of education (Khan, 2019), which are characterized by simplicity and accessibility and include social interactivity (Reinders, 2017).

Augmented reality applications and tools provide University teachers with the opportunity to integrate 3D videos, texts, animated authentic materials into the learning process, which facilitates engagement and effective assimilation of material for students, forming a complete understanding of the opportunities, events and processes presented to students in classes; contribute to regeneration of learning processes for visual perception of received information (Jamrus, 2019). This technology in the educational context is based on the principle of visibility, aimed at a complete understanding and perception of the material, increasing the level of engagement and level of motivation among students. The core of augmented reality is interactive technology with the help of which the user overlays digital content on an object of the real world that is read from digital devices (Averjanova, 2019). The advantages of using AR technologies include practical-oriented training aimed at improving and developing the skills and skills of students in the professional field, the readiness of students to use the obtained theoretical knowledge in solving practical problems.

We have formulated the main characteristics of AR in learning process which reflect the authors' approach to the implementation of this technology:

1. Contextuality – the students can experience the real world and virtual elements simultaneously;
2. Interactivity gives the possibilities to interact with AR through the manipulation of both real objects and virtual properties, which offer novel possibilities for interaction;
3. Spatiality – virtual elements placed inside the 3D real world appear as if they were really there.

AR technologies are used in various areas of the educational process (laboratory work in chemistry and physics, architectural areas, medicine, language training, practical classes in painting, astronomy, etc.), including for students with limited opportunities, which implies the universality and quality of education using this technology. Often by means of a computer or mobile device screen, AR can enhance a student's environment, allowing them to visualize and interact with a concept that is otherwise inaccessible or difficult to comprehend. Students are able to build and retain knowledge by applying additional sensory skills (Ericksen, 2020). Many AR applications provide an opportunity to diversify the educational process in universities. Despite this, these technologies are rarely used in the formation of foreign-language competence.

This technology allows you to:

- offer students links to authentic materials (vocational-oriented texts, articles);
- organize classroom and out-of-audience independent work of students;
- listen to audio material and view authentic videos;
- organize project activities;

- offer access to links for downloading electronic textbooks, literature or additional information on a given topic;
- provide students with links for testing in order to control the formation of knowledge in students (ClassTools.NET, QRTreasureHuntGenerator) in a foreign language;
- post up-to-date information in the form of QR codes on stands in universities (schedule, schedule of teachers, competitions, and Olympiads, project protection, conferences).

QR coding requires a generator that is freely available on the network, which is easy to use and does not require special knowledge and skills in application: Qrmania.ru, Creambee.ru, Goqr.me, Keremerkan.net. These resources allow you not only to create a QR code, but also change the size, background, color of the source text. To decode the QR code, you need a phone camera and a code recognition program (some phones have this feature built into the camera): ScanLife, NeoReader, ReaderKaiwa, QR Droid. Decoded text can be stored in the memory of any electronic medium. There is an automatic generation of QR codes, presented in the form of a flash drive with information placed on it. This virtual information on the server is accessed by users with existing embedded code and information download statistics are automatically maintained.

After we have analyzed current learning tools in the context of augmented reality, we have introduced QR codes into the English learning process to realize the didactic capabilities of computer technology, as we have already mentioned above in our article. The experience of the university teachers of the Department of Foreign Languages of The Volga State University of Telecommunications and Informatics in the use of QR codes in teaching English in accordance with the specialization of students allows them to be used for surveys, testing or to supplement or "revitalize" the image, in case it is a country study material. We offer students QR codes placed in the text for transition to an additional information resource on a relevant topic, located in the electronic library of our university or on various Internet resources. When pointing at the QR code, students are offered video material that complements the language portfolio of students, develops the perception of foreign-language authentic material, and improves the phonetic perception of the material.

Based on the tasks and goals of the discipline studied, the University teacher chooses specialized software: tablets, smartphones, AR-glasses helmets. The application of Augmented reality in the context of higher vocational education is determined by the following pedagogical advantages:

- improving the efficiency and quality of education through the use of advanced immersive technologies (Augmented reality, Virtual reality, Artificial intelligence, mixed reality);
- increase student involvement and interest in the subject or discipline in comparison with traditional teaching methods and means;
- visualizes in detail the studied object and concretizes abstract concepts, which helps to remove difficulties in the educational students 'process with the perception of the subject;
- stimulates students' self-education skills and instills self-development skills, develops self-work skills;
- develops the desire of students to apply modern technical innovations, forms not only users' skills, but also professional skills in working with information and computer technologies;
- implemented through accessible information technologies (telephone, smartphone), does not always imply significant material costs for the purchase of additional technical equipment.

Like any educational method using innovative technologies implementing augmented reality has negative aspects:

- leads to the breakdown of interpersonal relations (connections) between the participants of the training (teacher-student);
- there is a significant gap between the development of information and computer technologies and technologies that are used in the actual practice at universities, the lack of teaching literature and recommendations;
- lack of necessary training or retraining of faculty and formation of necessary digital skills to work with advanced educational technologies.

During the years of study at the university, modern graduates need to become not only the highly qualified specialists according to their specialization, but also acquire proficiency in the skills of working with digital technologies. The digitalization of modern society leads to the reform of the system and the transformation of the content of higher professional education, contributing to the interest and involvement of students in the studied discipline (Manikovskaya, 2019). Among

the necessary competencies of graduates of universities is the acquisition of digital skills by students and the acquisition of digital literacy skills.

With certain digital skills and technological devices, students can see and hear digital objects, it is possible that in the foreseeable future they will be able to touch them. Using multimedia information, University teachers can contextualize and adapt information for students. Augmented reality technology provides an opportunity to learn in practice, to be involved in interactive activities. The roles of students and teachers are transformed, which leads to a change in the traditional form of learning, greater involvement in the educational process, and rapid assimilation. VR favorably influences the creation of an active learning environment, develops cooperation and makes it possible to study outside the classrooms, which in turn allows you to develop an independent, creative approach to learning (Dementjeva, 2018).

Any technology used for educational purposes involves the creation of modern and effective methodological recommendations. The application of Augmented reality in the modern educational context can be represented by means of applying – codes. QR code (Quick Response – quick answer) is a matrix code presented in the form of encoded information (a black and white square with a volume of about 3 thousand bytes) (Law, So, 2010), which is recognized by pointing a smartphone camera at it. A special beam scans both information and converts it into a picture or text. In the toolbox of any University teacher working with multimedia tools there are sources and resources aimed at solving educational problems used by the teacher both in classroom hours and in out-of-hours activities. The large variability of QR codes facilitates their integration into the educational process. The use of QR codes in an educational context contributes to the effective assimilation of the material, since students have access to information resources, and thus they minimize the time spent looking for the necessary and relevant information (Esra, 2019). Having printed the QR codes, the teacher can supplement them with methodological manuals, notes or student workbooks, diversify the theoretical part of the discipline textbook.

5. Conclusion

The undeniable benefits of Augmented Reality technology are interactivity and visibility, which are important factors in the learning process. Augmented reality tools cannot completely replace a teacher, acting as a consultant or partner in communication. This technology is a modern tool in the process of mastering students' language and computer competencies, the effectiveness of which was proved during our experiment.

The introduction and testing of augmented reality technologies in English language classes for students of technical universities proves the effectiveness and convenience in application with educational materials, a justified didactic basis for its application in the context of education. The effective combination of traditional and modern computer and digital technologies is the optimal model for creating pedagogical conditions of study, expanding the teacher's pedagogical portfolio and for forming the necessary language competencies in a foreign language among students.

Studied and analyzed material allows us to come to the following conclusions: augmented reality applications have simple and convenient interfaces; there are ready-made developments and do not need to spend time creating new ones for training purposes; AR applications can be widely used in English language classes to introduce professional and country studies in ways that increase the efficiency and motivation of students. In addition, AR applications help to form the crosscultural and sociocultural competencies of students.

6. Conflict of interests

The authors declare that they have no conflict of interest.

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