



Latest Innovations in Teaching English Using Virtual Reality Technologies

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ABSTRACT

This paper presents an analysis of innovative solutions using virtual reality for the practice of foreign languages on the example of the English language. There are two types of software applicable in the framework of the educational process in schools and universities: specialized and related developments. The results of the analysis demonstrate that virtual reality as an educational technology has potential, but is still at the initial stage of its development, and existing applications need methodological improvements and additional research on effectiveness.

Keywords:

Virtual reality, information technology, pedagogy, methodology, educational technology, English

I. Introduction

At the moment, the number of products for teaching and practicing foreign languages in virtual reality is relatively small [1]. The list of scientific studies on this topic is also limited to a small number of publications. Nevertheless, existing works talk about the advantages of a virtual educational environment, such as visibility, involvement, focus, the effect of presence, overstimulation of the senses, safety, and many others. Of course, like any new technology, virtual reality should be studied much more fully, and in the course of research its advantages and disadvantages should be identified in comparison with other tools. However, the potential of technology for education is undeniable.

II. Research Methodology

Leaving the terminological discussion outside the scope of this work, we will make a reservation that only those applications that involve the use of a virtual reality helmet were included in the review, since the maximum effect of presence is fundamental for learning

languages. It is believed that with screen interaction (the so-called "desktop VR") immersiveness is reduced. All applications and platforms on which you can learn a foreign language are divided into two large categories, which we will call specialized and related tools. By specialized solutions, we mean developments whose main goal is to directly learn languages, while learning a language in related applications is an additional opportunity.

III. Overview of FL Specialized Innovations

MondlyVR by ATi Studios is a virtual reality learning app designed specifically for language learning [2]. The essence of the application is that the student is "transferred" to a virtual environment where he or she can interact with virtual characters through speech recognition technology. Immediately after starting the program, the student indicates his native language and chooses one of thirty languages for training (strictly speaking, there are twenty-nine of them, since British and American English are given as different

languages). The user is then given two options to choose from. First: you can choose a communicative situation for the practice of speech, namely, working out a certain dialogue and simple phrases. There are only four such situations: train, taxi, hotel reception and restaurant. The second option is lexical mini-lessons on topics such as animals, vegetables, fruits, space. Despite the simplification of graphic elements (low-poly graphics, primitive animation), the design does not raise any complaints and contributes to the feeling of presence. However, this feeling disappears when you try to verbal interaction with the characters. Firstly, when a character addresses a student, the latter can only choose from the options offered by the program. These options are a rather cumbersome interface element, which also negatively affects the perception of the situation as realistic. Secondly, to record a voice, you need to hover the controller pointer over the interface element depicting a microphone and press the trigger, which makes the speech interaction non-spontaneous and the dialogue drawn out. And lastly, the student cannot ask questions to the interlocutor himself: the initiative in the dialogue always belongs to artificial intelligence. As for vocabulary lessons, the program is poorly developed in this part. The "speech-to-text" technology is used, which, despite being cheap, is inadequate for the purposes of language teaching. Incorrect intonation, gross grammatical errors ("I will stay at the hotel until Friday"), non-usual use of vocabulary, and so on make the robot not just ineffective, but rather a harmful simulator [3]. Thus, subject only to improvements and bug fixes, MondlyVR can be integrated into the educational process or recommended as an additional learning tool. Such an application will be especially useful for students with an A2 (pre-intermediate) level to practice elementary dialogues, and possibly also for students experiencing communication difficulties, commonly known as a "language barrier".

Virtual Speech. Unlike the previous application, virtual reality in educational courses from "Virtual Speech" (from the company "VirtualSpeech Ltd.") is an additional element in a comprehensive learning system

[4]. So, the distance course "English for Business" includes two components. The first is a standard online course with the design of the FutureLearn platform (a popular educational platform that mainly hosts massive online courses) with video lectures, articles to read, tests and case studies. The second and no less important component of the course is practice: the theoretical knowledge gained is proposed to be applied in virtual reality. The course includes 49 lessons and 6 "VR" scenarios. Let's consider how it works on the example of the topic "business networking". After a video lecture and reading additional literature, the student is invited to apply the acquired knowledge in practice. Wearing a helmet, the student finds himself at a typical professional event where he or she can talk to each of the colleagues in sequence. Unfortunately, the feeling of immersion in the communicative situation disappears due to the non-interactivity of the characters: they only speak the recorded audio recording, separated by pauses during which the student can speak. In this case, the content of the student's speech is ignored by the program. In order for the interlocutor to continue the conversation after a pause, you need to press a special interface button. After the completion of such a "dialogue", the system evaluates the degree of support for visual contact and offers a mini-test based on the heard material in the form of choosing the correct answer. For example, you need to answer where the interlocutor is from, what company he works for, why he decided to attend this event, etc. Such an exercise not only trains the skills of listening to sounding foreign speech, but also develops the attentiveness and memory necessary in professional communication. Separately, we note that the non-interactivity of characters is not fundamental in other scenarios, for example, at a rehearsal of a public performance. Having preloaded their presentation, the student must speak for a sufficiently long time in front of a virtual audience of ninety people, trying not to be distracted by those who are moving, writing or drinking coffee. A useful feature is the ability to save an audio file of your speech and later analyze it, or share it with colleagues or a

teacher. With the advent of courses such as the one described, one can be wary of talking about a new type of blended learning (“blended learning”), where the virtual reality component acts instead of the face-to-face component [5]. The question of the effectiveness of remote offline methods of teaching foreign languages is still open, but a virtual reality tool, properly integrated into the online language course system, can be of great help to those students who prefer to learn languages on their own online.

Varvara is a series of courses and scenario-modules developed by methodologists of the NTI Center for Neurotechnologies, Virtual and Augmented Reality Technologies in Russia for learning and practicing English on the patented platform of ViAr Supersonic LLC [6]. The application is designed for students who are at the initial stage of learning English (“A1” - “A2” according to the common European system for assessing the level of foreign language proficiency). The Varvara software is aimed at solving several teacher tasks at once: speaking a foreign language within a lesson, overcoming the “language barrier” and fear of making a mistake, creating conditions for increasing interest in learning English. In accordance with the concept of the developers, the dialogue simulator is not intended to replace the textbook or the teacher in the lesson, but should be used as an addition to the traditional foreign language lesson. “VR” scenarios are accompanied by a user manual and methodological materials for the teacher and student. The application is based on two methodological principles: communication and situationality. The student receives a variety of opportunities for the practice of speaking, and this practice is carried out in conditions as close as possible to the real communicative situation. In total, thirteen scenarios were developed in four different locations: a gym, a fast food cafe, a gallery, and a hotel. In addition to the complex of environment and objects, communicative situations include role-playing, social status, activities and moral relations of the speakers.

Applications for learning vocabulary.

There are several mobile apps for memorizing words; not so long ago, similar applications

using virtual reality technology were added to them. Studying the vocabulary here is similar to physical vocabulary cards or learning words using the sticker method, which is well known to many: stickers with the names of these objects (refrigerator, mirror, door) are glued to all objects in the surrounding space (usually a house or office). So, by putting on a virtual reality helmet and downloading the VR Learn English app from ProVR Games, the student enters a virtual apartment with an extremely simple, schematic design [7]. The student moves around the apartment in accordance with the movement of the head, while hearing the sound representation of the surrounding objects and written versions of the corresponding words. The application is intuitive, loads quickly, and primitive graphics do not cause strong rejection, since it is enough to implement the main function of the application: memorizing words. From the point of view of methodology, it may raise a question of the effectiveness of learning vocabulary in isolation from the context, but the possibility of learning without using the student's native language is a very important advantage of the application in terms of a communicative teaching methodology.

The PanoLingo app by ITgenerator, which bills itself as the first app for learning languages, is the same as the previous one: the student is also in the home environment, also learning the spelling and sound of surrounding objects [8]. PanoLingvo achieved greater realism by using 360-degree panoramic photos, but deprived the student of the ability to move in space (imitation of movement). In the program, in addition to the house, there are other locations, for example, a bus, a store or an office. The main drawback of the application at the moment is its underdevelopment: starting with the official website, where there are grammatical errors in the texts, ending with serious errors in the program itself, which, for example, do not allow moving from one word to another in the learning process. Nevertheless, it can be stated that the techniques for memorizing new words in the process of learning a foreign language have been replenished with another tool that is available

using VR technology. The effectiveness of such techniques is a promising area for research.

Concluding the review of the main specialized applications for learning foreign languages, it is impossible not to mention that some products are in the process of development. For example, "*ImmerseME*" from "Immerse Ltd". Here, virtual reality will complement existing courses and logically integrate into the learning system. It is planned that these will be 360° panoramic videos with a recording of the speech of a real actor with whom the student will be able to have something similar to a dialogue. Another interesting program under development is the virtual reality language learning game "*Argotian*". The creators of the game claim that the combination of virtual reality, artificial intelligence and "*WebXR*" will allow to determine the level of language proficiency of a particular user and build an appropriate individual learning path. How successful the implementation of these ideas will be, the future will show. At the moment, the domestic market does not offer ready-made products for learning foreign languages in virtual reality. Nevertheless, the development of "*Smart Education*" from the Krasnoyarsk company "KTC" is worthy of mention. It is planned that the student will have the opportunity to practice communication skills by immersing himself in a virtual environment [9]. At the moment, the company has created two virtual spaces: an airport and a room, and at the airport, according to the developers, it is possible to maintain a simple dialogue with artificial intelligence. At this stage, the project needs serious improvements.

IV. Overview of FL Half-Related Innovations

The list of virtual spaces where you can improve your language skills (first of all, we are talking about English) is much wider than the list of specialized tools. Three groups of applications can be distinguished here: virtual social networks, educational platforms and games. This review focuses on the first two.

Social networks. There are more and more virtual platforms for communication, for example, various "VRChat", "Altspace", "VTime",

"Facebook Spaces", "Recroom" and others [8]. In the context of this review, they are united by one thing: the possibility of language practice, and the choice of a particular platform is a matter of preference for the student himself. Let's take a look at how this works on the example of the Altspace program, which technically repeats VRChat, except for some technical limitations (for example, fewer options in choosing an avatar). The slogan "Altspace" can be translated as "Do not vie alone", and here everything is aimed at communication. There are three main options: 1) interactive games with friends, 2) virtual events, 3) chatting with friends and strangers. You can get to know someone and keep up a conversation in the language you are learning, both at a virtual event and by joining an open meeting. Community members are usually friendly and initiate communication themselves when they see a newcomer. If one of the interlocutors behaves incorrectly or is too active, you can turn off the sound of his avatar. In a similar program, VTime, it is easier to focus on the practice of languages: beautifully rendered spaces (by the fire, in the meeting room of a skyscraper, and even in open space) are designed for a small number of participants and are conducive to calm communication. On the platform, you can both meet friends and meet new people. "VTime" is a cross-platform social network, or as they call themselves, "cross-reality social network". The term "cross-reality" is used for a reason. "Vtime" gives three options for communication: "VR", "AR" (helmet required) and "screen version" (helmet not required). Some language teachers are already using virtual social spaces for various conversation clubs. It seems that this format of classes suits introverts: some students may feel calmer and safer using an avatar. In addition, there are students who prefer a more informal and more natural extra-curricular environment in which they can relax more easily than a formal classroom, and this is often important for the practice of speaking.

Educational platforms. If a teacher wants to conduct lessons close to the traditional format and use presentations, text materials, various objects, videos, etc., then virtual reality offers specially designed educational platforms.

"EngageVR" from "Immersive VR Education" allows you to gather an audience of up to sixty people, using in the classroom not only standard tools such as a whiteboard, but also various 3D objects that can be manipulated in virtual space (for example, increase a molecule to a giant size while giving a lecture livelier and visual) [9]. In addition, the platform contains several ready-made tutorials, as well as a series of 360o videos that can be embedded into the lesson structure. Unfortunately, despite the ambitiousness of the project and the prospects for development, the platform is still not ready for use. First, each learning space takes a very long time to load, 15-20 minutes on average. This could be explained by downloading the entire scene from the server, but when the server is closed, all downloaded data is deleted. Secondly, the use of program functions, such as manipulation with objects, requires additional skills on the part of the teacher due to the non-intuitive interface.

The Rumii platform from Doghead Simulations, with the same set of features and tools (whiteboard, 3D objects, screen sharing, file sharing), is faster and more intuitive to learn, although it has simpler graphics. The developers position themselves as an "immersive office", emphasizing that "Rumii" is a space for meetings, joint remote work and study. The great advantage of the program is cross-platform, including the ability to work on iOS. In cases where an educational institution cannot invite a teacher who is a native speaker to classes, the use of "Rumii" seems to be the most justified.

The latest development worth mentioning is ClassVR by Avantis Systems Ltd. [10] The company produces its own virtual reality helmet, used exclusively for classes in specially designed programs for several school subjects (history, science, art and culture, security basics, etc.). This autonomy simplifies the implementation and use of technology: you can buy a set of eight or four helmets in a special portable storage box, and the set is immediately ready for use. In addition to virtual, augmented and mixed reality content, class materials include lesson plans, quizzes, games, case studies, and other activities. The developers

also offer free demos and teacher training. The downside is the high cost of training kits and focus on the UK school curriculum.

V. Conclusion

The existing means of learning foreign languages in virtual reality is a collection of disparate developments of varying degrees of quality and completeness. Unlike the market for English textbooks, which has its own leaders and canons developed in the course of numerous studies, there are no such leaders in the field of virtual reality. So far, we can only talk about three main areas of using VR technology for learning foreign languages. This is virtual reality as: 1. An autonomous tool for training one or another linguistic skill or skills; 2. A component of an integrated program; 3. An educational environment that is an alternative to the physical learning space.

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