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V-learning and Modern Development Trends in Computer Linguodidactics: Virtual Language Environment

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Abstract

The urgency of the problem is due to the emergence of new concepts in the field of development of distance learning systems (DLS) and the necessary refinement and assessment of the latest trends in this area. The purpose of this article is to describe the experience of using the virtual language environment for teaching Russian as a foreign language (RFL) and to try to clarify the definition of the term 'v-learning' (learning in virtual reality) relatively to the term 'e-learning' (learning with the use of electronic educational technology) in the light of the development of computer technology and user interfaces. The main theoretical research methods are: direct observation; descriptive method, classification and modeling. The article presents refined definitions of v-learning and e-learning. The results of experimental learning and obtained data during the survey are described. The research results presented in the paper may be useful for the design and development of DLS based on virtual reality technologies.

Key words: distance learning, computer linguodidactics, virtual worlds, VR, v-learning, e-learning, Russian as foreign language, communicative learning.

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Introduction

The influence of the development of hardware platforms and interfaces on the content and scope of methodological concepts

In the beginning of the 21st century, computer linguodidactics is experiencing a boom in the development of distance learning. There are many virtual schools and language courses offering their services, both free of charge and on a commercial basis. Competition in this area forces software developers and methodologists to look for more attractive forms of presenting the material based on gamification and social interaction. The need for integration of electronic educational resources with tools providing online social interaction is felt increasingly, and this determines the relevance of the study of such systems and their classification. The use of virtual reality (VR) technologies in communicative teaching of Russian as a foreign language is one of the rather new phenomena in computer linguodidactics which has a number of key features differing it from e-learning. Given the variety of modern operating systems (Windows, Macintosh, Linux, Android, IOS, etc.), developers of distance learning systems (DLS) and electronic educational resources (EER) strive to create and use cross-platform solutions. Cross-platform software is able to work on the maximum number of operating systems. The increase in the software platforms number and improvement of computer technology is changing the understanding of what a computer is today and affecting terminology. For example, a mobile phone is technically a computer with a multi-core processor and processing power. Can we talk about learning with mobile apps as computer-based learning? Yes, we can, but the specific features of such training define it as m-learning (mobile learning), i.e. "learning across multiple contexts, through social and content interactions, using personal electronic devices" (Crompton, 2013). Thus, we get a subset of the concept of e-learning, which nevertheless has a number of features that do not contradict the general concept, but complement it.

The problem of determining the scope of the concept of e-learning

E-learning, less commonly e-education is a learning system that involves the use of Internet technologies, electronic libraries and educational and methodological multimedia materials (Azimov & Shchukin, 2009). E-learning technologies traditionally include the use of various Internet applications, programs, electronic textbooks, dictionaries, chat bots and other software products that operate on various computer, software and hardware platforms. E-learning technologies are most relevant not only for distance learning Russian as a foreign language (RFL), in the absence of a full-fledged language environment, but also when implementing a blended learning model. Understanding of this term depends mainly on the breadth of view

of each individual researcher. For example, the definition given to this phenomenon by the European Center for the Development of Vocational Training (CEDEFOP) is formulated as follows: "Learning supported by information and communication technologies (ICT)" (Terminology of European education and training policy, 2008, p. 68). Balykhina et al. (Balykhina et al., 2016, as cited in Azimov & Shchukin, 2018, p. 393) define the concept of e-education as "learning with the help of information and electronic technologies", including here not only computer assisted learning, but also mobile assisted learning. The content of this term is so broad that it becomes synonymous with any distance learning system.

The concept of v-learning and the origins of its formation

Learning using virtual reality technology is defined as "v-learning". Virtual reality (VR) is a reflection of reality with the help of certain technologies and technical means, allowing to partially or fully immersing a person in this reflection and creating the illusion of real reality (Azimov & Shchukin, 2009). The principle of creating virtual reality is based on the use of computer technologies, which make it possible to immerse a person in an artificial world created by technical means. On the basis of VR technology, three-dimensional (3D) educational virtual worlds and interactive environments are created, with an opportunity to make a simulation of various communicative situations and events. Virtual classrooms, lecture halls and library halls are recreated in 3D environment, and lectures, seminars and colloquies are held online giving an opportunity for many students to attend them remotely. On June 23, 2003, Linden Lab launched one of the most successful projects of the virtual 3D social network "Second Life" (Antonacci et al., 2008), thereby laying the foundation for the practical implementation of the concept of three-dimensional Internet (3D-web) for widespread use. Second Life is a multi-user 3D virtual world, with elements of hypertext and hyperlinks. The virtual world or massively multiplayer online world (MMOW) is a three-dimensional interactive computer environment populated by many users who create personal avatars, explore the virtual world and interact with other users (Bartle, 2004; Aichner & Jacob, 2015). Since then, in the literature on this subject, the three-dimensional Internet has often been associated with virtual worlds (Dilsha & Bisny, 2015).

The problem of accessibility of the language environment in the distance language learning process
The use of the language environment when teaching a language is seen by modern researchers as a factor of paramount importance in the development of a secondary linguistic personality. Orekhova convincingly proved that in the language environment, almost any elementary linguistic and sociocultural knowledge is acquired spontaneously. The quantity and quality of perceived language units depends on the level of language proficiency, length of stay in the language environment, internal motivation, the sphere of communication in the language environment, purpose of stay in the language environment, geography of

residence and many other objective and subjective reasons (Orekhova, 2004). The cycle of teaching Russian as a foreign language using DLS is incomplete without immersion in an authentic language environment and active language practice, which allows students to actualize language knowledge and gives practical communication skills in the language being studied. The problem of providing students with access to a full-fledged language environment in the framework of distance learning using computer-aided learning tools (CALT) is becoming increasingly important. In addition, students may experience psychological barriers while entering real communication in a foreign language. These problems are associated with various negative effects, for example, interpersonal uncertainty, fear of making a mistake, a feeling of awkwardness when communicating in a foreign language environment, a negative assessment of own language skills and self-doubt. One of the possible ways to solve these problems seems to be the use of artificial language environments created using modern computer technologies, in particular three-dimensional computer graphics and VR.

Purpose and objectives of the study

The purpose of the study is to describe the experience of using a virtual simulator of Russian language environment and to define the concept of v-learning in relation to e-learning, in the light of the development of user interface technologies.

Literature review

The issue of using virtual worlds as a simulator of the language environment is complicated. It contains several basic aspects: methodological, psychological, sociological and technical. Earlier, the special features of the language environment in teaching Russian as a foreign language were considered by Orekhova (2004). Web 3D technologies and their application were described in articles by Thomas et al. (2015), Dilsha & Bisny Thomas (2015). The communicative methodology of group learning a foreign language using Second Life was previously described in the article by Shin (2011). A wide range of virtual learning issues using Second Life was presented by Antonacci et al. (2008). The issues of the psychological impact of virtual worlds and interactive virtual environments on users were considered in articles by Belozerov (2015). The nature of user interaction in multi-user environments during virtual learning and the effect of social presence have been described by Tu & McIssac, M. (2002). The issues of development of virtual worlds based on multiplayer computer games and its definition was analysed in the book by Richard A. Bartle (2004).

Methodology

In the research process, the following methods were used: direct observation; descriptive method, which includes observation, comparison, classification, generalization and interpretation; modeling, analysis of existing distance learning systems.

The empirical base of this research includes the study and generalization of pedagogical experience; using the personal experience of the authors as developers of virtual educational environments for teaching Russian as a foreign language; conducting experimental training and questionnaires.

In the process of research, a pedagogical experiment was conducted on the basis of creating a virtual language environment. The development process used "OpenSimulator" – an open source multi-platform, multi-user 3D application server (http://opensimulator.org/wiki/Main_Page).

The purpose of the experiment: To find out how productive the use of a virtual simulator of the Russian language environment is in the process of overcoming psychological barriers when entering into foreign language communication.

Participants

Group "A". The desire to participate in the project as a native speaker of the Russian language was expressed by 13 people, aged 32 to 56 years.

Group "B". Students studying Russian as a foreign language using distance learning systems outside the language environment. Number of students studying Russian: 12, aged 19 to 36 years. Language proficiency level: A2-B1.

The preliminary stage of the research

The following activities were conducted at the preliminary stage:

- developing the virtual Russian language environment;
- putting participants in the virtual language environment;
- analysis of the participants' communicative activity.

According to the rules of the project, participants were supposed to use Russian as the only language for communication. In order to stimulate creative activity and increase the effect of involvement in the project, regions of the virtual space were transferred to the ownership of users. According to the rules, each region should belong to at least two users, one of which is a native speaker, and the other is a foreigner studying Russian with the help of distance learning courses at the level of A2 to B1 and needing speech practice.

Project participants had to visit the virtual environment at least 5 times a week with session duration of at least 2 hours. The total duration of the practice is 3 months. No specific instructions for any activity were given. It was assumed that participants should behave naturally, while not violating ethical standards and communication culture, which was enshrined in the rules of using the resource. During the first week, members of Group "A" created a virtual environment for their regions. A week later, members of Group "B" were connected to the project. Available methods of communication: graphic chat (nearby chat, individual message) and voice communication (via microphone).

In the first session, the participants got to know each other, created various buildings in 3D and exchanged impressions. Considering that students and native speakers had to share a common area, they also had to agree on plans for its development and architecture. Native speakers and students organized various events on their own initiative, for example, live performance of Russian songs with a guitar (the user played the guitar and sang, the sound of the instrument and voice was output to the virtual environment through a microphone), virtual parties with Russian pop music and foreign music were organized once a week. Students practiced communicating with native speakers and also got acquainted with culture and the system of values inherent in the people of Russia and the CIS countries.

The major stage of the research

The following activities were conducted at the major stage:

- the questionnaire survey
- analysis of the survey results

After the experiment, a questionnaire was conducted among the participants of group B to determine the subjective characteristics of the perception of the virtual Russian language environment and the degree of psychological readiness of students to enter into real communication with Russian native speakers. The questionnaire consisted of 14 questions. In total, 12 answers to each question were received from each member of Group "B":

1. Rate the attractiveness of this format of speech practice. For the answer, a scale of 1 to 5 was used.

2. How comfortable were you in communicating with your interlocutor in the virtual world? A scale of 1 to 5 was used for the answer.

3. Have you experienced a feeling of awkwardness or insecurity during a virtual communication session with previously unfamiliar people?

Options were:

- Yes
- Yes, a little
- No

4.   How satisfied are you with your own language proficiency level and speech skills after talking with native speakers? For the answer, a scale of 1 to 5 was used.

5.   Did you find friends among native speakers of the Russian language?

Options were:

- Yes
- No

6.   Do you plan to keep in touch with your new friends (*in real life or any social media*)?

Options were:

- Yes
- No

7.   Do you feel more confident in communication in Russian now after you tried to practice in the virtual world?

Options were:

- Yes
- No

8.   Is it easier for you to speak Russian after 3 months of practice with native Russian speakers?

Options were:

- Yes
- Slightly better
- Much better
- No

9.   Have you learned anything new about Russia and Russian culture during your virtual speech practice?

Options were:

- Yes
- No

10.   According to the rules of practice, you had to spend at least 2 hours in the virtual world every day, except weekends. Please tell how much time did you really spend in the virtual world?

Options were:

- Two hours a day, except weekends.
- Two hours a day, including weekends.

- More than two hours a day except weekends.
- More than two hours a day, including and on weekends.
- It varied depending on free time availability.

11.   How valuable has your avatar become for you? For the answer, a scale of 1 to 5 was used.

12.   Do you plan to continue visiting virtual worlds after completing the course?

Options were:

- Yes
- No

13.   Evaluate your readiness to communicate in Russian in reality before your participation in virtual practice. For the answer, a scale of 1 to 10 was used.

14.   How much has your readiness for real communication in Russian increased after virtual practice? For the answer, a scale of 1 to 10 was used.

Results

After processing the survey results, the following data was collected:

Figure 1. Attractiveness rating of virtual format of speech practice
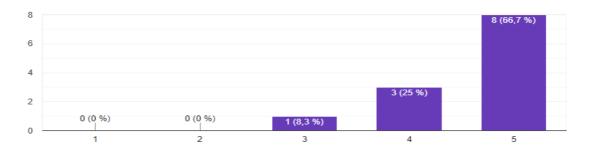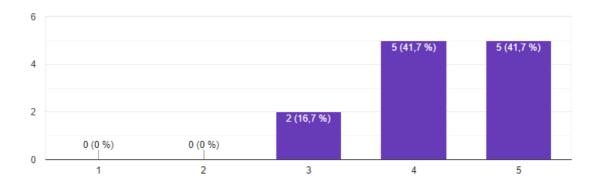
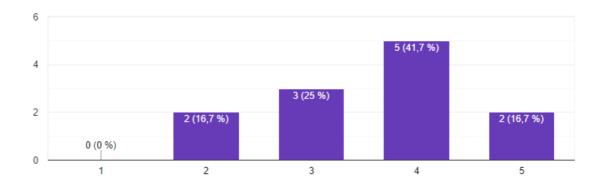Figure 2. The evaluation of comfortability of virtual language practice

Q: Have you experienced a feeling of awkwardness or insecurity during a virtual communication session with previously unfamiliar people?

Yes – 0 (0%)

Yes, a little – 2(16.7%)

No – 10 (83.3%)

Figure 3. The evaluation of students' satisfaction with their Russian language skills
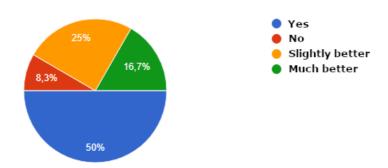

Satisfaction with language skills was assessed by members of Group "B" on the basis of their practical achievements in communicative goals and objectives when communicating with native speakers in a virtual language environment. Only two people (16.7%) in the group found their own language skills quite sufficient for communication in the Russian language environment. This rate does not mean achieving a level of language proficiency on a par with a native speaker, but merely reflecting the level of satisfaction

with their own skills relative to their expectations. Achievement of some communicative goals is quite possible at any level of language proficiency.

9 participants (75%) answered affirmatively to the question "Did you find friends among native speakers of the Russian language?". 50% of participants plan to continue to keep in touch with new friends. Friendship between members of both groups can potentially contribute to further language practice outside the virtual environment, or the collaboration of students on the path to joint language learning, which will positively affect the motivation for learning.

100% of respondents felt more confident after communicating with native speakers in a virtual environment than before this experience. The answers to the question about how easy to speak Russian became after 3 months of virtual practice showed the following picture of the results:

Figure 4. The subjective effectiveness feeling of language practice in virtual environment

50% of respondents said that it became easier for them to speak Russian after virtual language practice. 16% of respondents said that it became much easier for them to speak Russian. Another 1 respondent (8.3%) did not notice improvements in his conversational practice. 50% of respondents learned something new about Russian culture.
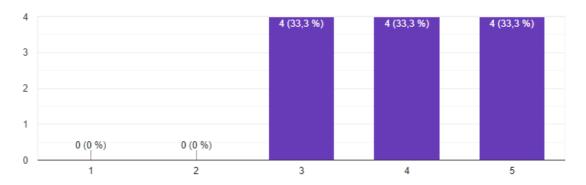
According to the rules, students had to spend at least 2 hours in the virtual world every day, except weekends. The following data were obtained during the survey:

Only one student strictly adhered to the rules of the experiment. Other students exceeded the time spent in a virtual environment.

- Two hours a day, including weekend – 2 (16.7%)
- More than two hours a day except weekend – 4 (33.3%)
- More than two hours a day, including and on weekends –1 (8.3%)
- It varied depending on free time availability – 4 (33.3%)

Exceeding the time limit by the participants may be explained by the attractiveness of the virtual environment, which can be a positive factor in virtual language practice.

Figure 5. The value of avatar for users

The appearance of the avatar is created by the users themselves. An avatar is one of the most significant factors that affect the degree of attractiveness of the process of interaction with the virtual environment. The more valuable the avatar is for the user, the higher the effect of attractiveness. 9 (75%) students expressed a desire to continue using virtual worlds in the future.

Figure 6. Evaluating readiness to communicate in Russian in reality before participation in virtual practice
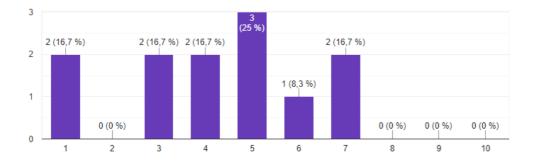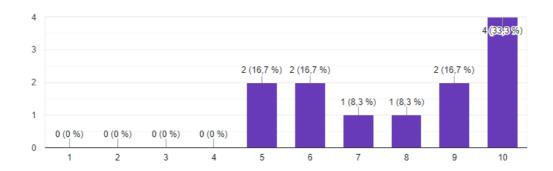
Figure 7. Evaluating readiness to communicate in Russian in reality after participation in virtual language practice.

Discussion

The features of subject-object paradigm of user interfaces as a basis of differentiation e-learning system concepts

Obviously, today computers dominate in the field of electronic technical communications, providing the most affordable, fastest and safest way to exchange information, as well as being the main technical means for e-learning. Thus, it is possible to formulate a general definition for e-learning, which would not conflict with existing definitions, but at the same time would clarify the content and scope of the concept, based on the basic principles of its functioning: E-learning is a learning system supported by electronic learning tools and the Internet.

By electronic learning tools (ELT) we mean electronic textbooks, trainers, online courses, online reference books, electronic dictionaries, etc. The Internet is understood as "a worldwide (global) system of computer networks, an integrated network system consisting of heterogeneous communication networks interconnected" (Azimov & Shchukin, 2009). The meaning of the "Internet" in this context is important. Today, in most cases, this term means the World Wide Web (WWW), which unites resources supported by hundreds of millions of servers around the world. Essentially, the interaction between the user and the website follows the same principle as the interaction of the reader with a regular newspaper or book. The user gets acquainted with the information by turning pages, some of which, in addition to text, may contain multimedia content (video, audio, etc.). Thus, the interaction between the user and the Internet resources, as well as with other programs, including ELT, is carried out through the user interface (UI).

The process of interaction with the user interface implies a certain paradigm of subject-object relations between the human user and the machine. In the process of computer technology development, the

interaction between man and computer has undergone several changes in the main paradigm, from punch cards, switches, command line to the graphical interface of modern user operating systems. The characteristic of the subject-object paradigm of interaction with the user interface is proposed by us as the basis for defining v-learning and distinguishing it from many other subsets of computer-based learning systems supported by the World Wide Web.

Web3D and world virtual learning practice

Some researchers believe that it is more natural for a person to function in a three-dimensional environment than in a two-dimensional one. Therefore, the objects of the two-dimensional Internet should be eventually replaced by 3D models that will facilitate interaction with the material and ensure the realism of what is happening, consistent with real life experience. A new form of the Internet is able to bring the level of human-machine interaction to a completely different level due to a higher level of immersion in the work process. Unlike regular Internet, 3D Internet (Web3D) is more attractive and interactive. If we take Second Life as a basis, then the Web3D is seen as a unique platform for realistic social interaction. Thus, Web3D is a combination of the Internet and 3D graphics. The result of this combination is an interactive three-dimensional virtual world, access to which is provided through web technologies (Thomas et al., 2015). To interact with the three-dimensional Internet, a kind of browser (viewer) is also used, which, in addition to displaying materials from ordinary two-dimensional sites, is also able to display the contents of three-dimensional virtual environments. Second Life was one of the very first platforms to enable learning using VR technology (v-learning). Here we see another paradigm shift in the subject-object interaction of the student (user) with electronic materials on the Internet. The user ceases to be an external agent, regarding the virtual educational environment, becoming its active part, which determines the nature of interaction with objects and materials of this environment. The next stage of the evolution of the user interface is carried out, from the graphical interface and cursor to the virtual environment and avatar.

Today Second Life is used by various institutions, universities and colleges implementing virtual learning programs. Here is an incomplete list of educational institutions that have virtual representations in Second Life: Arkansas State University, University of Delaware, North Carolina State University, Stanford University, Monash University in Melbourne, University of Western Australia, University of Texas at San Antonio, National University of Singapore, State University of New York (https://secondlife.com/destinations/learning/universities/). Some other educational institutions use OpenSim as a free counterpart to Second Life: North Coast Institute of TAFE, Marlboro College Graduate School, Southern Cross University, Illawarra Grammar School (Australia), New Jersey's Elisabeth Morrow School, New Jersey's Montclair State University, El Salvador's Academia Britanica Cuscatleca and some others

(https://www.hypergridbusiness.com/2013/08/best-grids-for-educators/). In Russia, the technology of virtual worlds is used for learning in the project "VAcademia" (http://vacademia.com/).VAcademia uses its own proprietary software that allows integrating a large number of additional functions into the virtual space, for example, conference calls, remote desktop, voting system and the ability to record events in 3D format. The main methodological approach used is the creation of a virtual educational space using various virtual tools and devices for presenting materials (video, audio, text, PowerPoint presentations, testing systems, etc.). Here virtual lectures, conferences, seminars and other types of educational events are held. More often a virtual language environment arises and develops spontaneously, in a more formal setting, based on a common user's language and culture. An example of using a virtual language environment is the "Language VILLAGE" methodology. VILLAGE is an acronym of "Virtual Language Learning and Group Experience" (Shih, 2014). Students who learn a language outside the language environment find a suitable community of native speakers of this language in Second Life and join it in order to ensure a constant speech practice. This allows the student not only to get motivation for further language learning and to acquire practical skills of communication with native speakers, but also to get acquainted with the cultural aspect of the language environment.

Definition of v-learning is justified on the basis of a number of specific features that are not characteristic of traditional e-learning: a) the presence of a 3D interactive environment; b) avatar-mediated activity (avatars are characterized by a high level of severity of the effects of human continuation in the used tool (Belozerov, 2015)); c) immersion (the effect of immersion in happening); d) exploring (research, study, user review of the virtual environment); e) active communicative social interaction (interaction with other users, which consists not only in verbal contact, but also in joint activities that include creating and operating virtual objects, exchanging objects, joint participation in real-time events, etc.); f) the effect of social presence (the degree of community feeling experienced by students in an online environment (Tu & McIssac, 2002)); g) personalization (a person's awareness of the social significance of his own personality and activities aimed at demonstrating his own personality).

Based on the foregoing, it is proposed to formulate the definition of v-learning as follows: V-learning is a learning system using virtual reality technologies. This term refers to the use of various 3D interactive worlds, immersive environments, language environment simulators and 3D social networks (for example, Second Life, OpenSim, VAcademia) for educational purposes. V-learning technologies are a conceptually complemented continuation of e-learning, introducing a simulation element of the real language environment into the learning process, which allows students to closely bring the language learning process to the practice of speech interaction in real communication with native speakers.

Conclusion

The results obtained during the experimental training in the virtual language environment confirm the conclusions of other researchers. Virtual language environment has high potential to overcome psychological barriers to entry into real native speakers' communication. Virtual worlds have a high degree of attractiveness for users; provide a brighter effect of immersion in what is happening than traditional e-learning systems. It is assumed that the reason for this is the principle of gamification, because the learning process in virtual reality is very similar to a computer multiplayer game. Virtual educational interactive environments provide an opportunity for students to safely make mistakes and observe the communicative behavior of their interlocutor. This helps a lot to overcome a sense of interpersonal uncertainty and to experience language skills in practice. It was found that virtual learning has many features that are not characteristic of traditional e-learning, which gives reason to highlight this phenomenon as an independent approach to distance learning. It should be kept in mind that virtual learning uses the same methodological principles of language teaching, which allows us to attribute this to a subset of e-learning systems.

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