Digital communicative technologies as a means of developing cognitive activity in english classes at a non-linguistic university

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Abstract — **The role of education in the development of the digital economy is of great importance: it is in the learning process (from secondary school to higher learning) that students gain knowledge and master the competencies necessary for the future specialists in the objective trends of modern society: globalization, integration and intercultural interaction. In other words, future specialists should have not only professional knowledge, but should also be able to engage in educational, labour and aesthetic activities, to use information digital technologies, to be ready for interpersonal and intercultural cooperation in their native and foreign languages. The bachelor's degree curriculum imposes on the future specialists requirements for mastering general cultural and professional competencies. Students have to cope with a large amount of information when studying in the classroom as well as independently. The problem is that in the process of vocational training, students acquire only the knowledge that arouses their interest. The teacher is faced with the task of stimulating the cognitive activity of students with the aim of motivating them to study various academic disciplines. The use of digital communicative technologies in English lessons involves the creation of an independent communicative product in an artificial language environment, thereby contributing to the formation of cognitive activity. The article discusses the system of phased formation of cognitive activity and describes conditions for the effective implementation of digital educational technologies.**

Keywords — digital communicative technologies, communicative product, artificial language environment, cognitive activity, formation methodology, efficiency conditions.

I. INTRODUCTION

The beginning of the XXI century was marked by a significant development of digital technologies, a revolution in the information space and the acceleration of the globalization of the economy. There is a continuation of the process of complication of social structures and relations, which are increasingly based on modern digital technologies. The key points in defining a digital system are the exchange of knowledge, technologies that allow to do it, people ready and able to participate in this exchange and manage it. The real indicator of the level of development of any economic region is the priority of the education system. It should be a high priority, but it should also aim at timely implementation of relevant innovations and changes in the educational process [1]. For this it is necessary to introduce new digital technologies into learning process learning English as well.

The English language is an important area in the educational system, knowledge of the language opens up new horizons for students. The status of English as a world language in science, digital technologies and international relations has shaped the corresponding priorities in its study. In our time, the educational system must comply with technological development and scientific achievements [2]. Thus, the use of new technological products should be effectively organized in the process of forming the cognitive activity of students.

The rapid development of the Internet, the use of computers in English lessons open up wide possibilities for solving these problems on the basis of computer-mediated communication and telecommunication, including the possibility to interact in real time in the form of oral and written communication, as well as to search for the necessary educational and scientific information [3].

Today, in the domestic and foreign methodology, there is a rather developed base for using digital educational technologies in the process of teaching foreign languages [1],

[4], [5], [6]. Most authors point out that the use of digital technologies contributes to the formation of students' cognitive activity in the absence of a natural language environment. It is possible to create a situation of communication with verbal and non-verbal communicative products with their help.

However, the analysis of the practical classes in the English language and the questioning of teachers and students showed that today there is some discrepancy between the modern theory of digital education and the practice of implementing digital educational technologies in the process of teaching English.

Most of the studies conducted are focused on specialized language training programs. The problem of applying digital educational technologies for purposes of the language study in non-linguistic universities remains open. This situation is based on the following reasons:
• insufficient material and technical equipment of universities, preventing the organization of the educational process using digital communicative technologies;
• insufficient level of knowledge of the methodology of applying innovative communicative technologies among teachers;
• the complexity of the selection of digital communication technologies associated with their great diversity;
• the focus of most digital communicative technologies on in-depth language learning;
• a relatively small amount of classroom time allocated for learning a foreign language in a non-linguistic university.

As a result the following contradictions arise:
• between the social demands of society for the digitization of education and the unavailability of higher education institutions to use innovative teaching aids;
• between a large variety of digital educational technologies and the inability of teachers to select them correctly;
• between the desire of students to use innovative educational products and insufficient amount of classroom time to use them.

The purpose of this study is to develop a methodology for stimulating cognitive activity by using digital communicative technologies in the process of English teaching in a non-linguistic university.

Objectives of the study:
1. To express the essence of the concept of "digital communicative technologies".
2. To develop a classification of digital communicative technologies.
3. To describe the methodology of stimulating cognitive activity by using digital communicative technologies.
4. To test the methodology and draw conclusions.
5. To determine the conditions for the effectiveness of the methodology in a non-linguistic university.

II. METHODOLOGY

This study is based on philosophical, psychological, psycho-educational, communicative and socially interactive approaches to stimulating cognitive activity in the conditions of digital educational technologies.

From a philosophical point of view, cognition is an active human activity [7], [8], [9]. Cognition is associated with mental activity.

According to psychologists the essence of cognitive activity consists in the cognitive attitude to the world of objects, phenomena, to knowledge about them [9], [10], [11], [12], [13].

In psychological and pedagogical research cognitive activity develops and is realized in activity, cognitive activity is considered as a quality of a person [14], [15], [16], [17].

The point of view of L.P. Aristova is of interest. L.P.Aristova considers the cognitive activity of the individual as a manifestation of its transformative attitude to the surrounding phenomena and objects [18]. The lack of a transformative attitude among students does not lead to the appearance of cognitively active actions; at best, we can only speak of motility, which is not the same as the activity of cognition.

As noted by T.I. Shamova, in mastering knowledge and ways of activity by students, purposeful reproductive activity takes place, which is active by the learner, but its level of activity is low [19].

Cognitive activity is encouraged by such motives as curiosity; enjoyment of the process of knowledge acquiring or its results; practical activities of people, their problems and needs, forcing them to look for ways to solve urgent problems arising in the course of development and improvement. When cognitive activity is created and expressed it influences the quality of cognitive process. Different students are characterized by different intensity of cognitive activity. In the context of English teaching under the bachelor program, the stimulation of cognitive activity comes forward. In the teacher's arsenal there are a number of ways, methods and tools that stimulate the cognitive activity of students. Analysis of modern approaches to the problem of research has shown that digital educational technologies have great potential for developing students' cognitive activity.

The foreign scientific school describes three main stages of using computer technologies in the teaching of foreign languages - behavioural, communicative and integrative. M. Warschauer calls this area Computer Assisted Language Learning, which means learning foreign languages with the help of computer technology [20]. Each stage is characterized by a certain level of technology development, as well as the corresponding pedagogical method. Today, as it has been already noted, it is possible to speak about the emergence and formation of a completely new stage in the application of digital technologies in education in general and in the teaching of foreign languages in particular, namely the socially interactive stage. This stage is

characterized by active social interaction of users due to the rapid development of social services Web 2.0 and their mobile applications, by content aggregation, rapid development of user content, online collaboration systems, instant access to educational material, etc. At this stage, digital technologies become an integral attribute not only of the learning process, but also of the daily life of a person due to the wide distribution of smartphones, tablet computers and other personal mobile devices.

The socially interactive period in education is based on the influence of technologies conventionally called Web 2.0 or the second generation Internet. The phenomenon of this socio-technological concept is studied by E. D. Patarakin, E. N. Yastrebtseva, J. West, S. Boss, J. Brown, T. Burrows, S. Downes, and many others [21]. The creation of the term Web 2.0 is traditionally attributed to the American author Tim O'Reilly, who published in 2005 the article *What Is Web 2.0 Design Patterns and Business Models for the Next Generation of Software* [22]. E. D. Patarakin describes the main technical features that highlight sites and services related to the second-generation Internet [21]. J. Siemens also formulates the principles of connectivity, consonant with the modern principles of learning with the support of Web 2.0 technologies [23]:
- learning requires a variety of opinions;
- learning is the semantic unit of knowledge or sources of information;
- the availability of learning and ability to learn is much more important than knowledge at the moment;
- gradual development of the training system and maintaining its links throughout the life;
- the main goal of training is the ability to find relevant information;
- the selection of objects of study in itself is also an object of study.

One of the most prominent pioneers in the field of digital communication technology is Joe Lambert, co-founder of the Center for Digital Storytelling (CDS), a non-profit, public creative organization in Berkeley, California. Since the early 1990s, this organization has been helping young people and adults to create and distribute their digital stories, combining thoughtful writing and digital media [24]. However, despite the existing emphasis on computer technology, digital narrative is not a new practice.

Another pioneer in this area, British photographer, author and educator Daniel Meadows defines digital stories as "short personal multimedia tales told from the heart" [25]. He believes that the beauty of this form of digital expression is that these stories can be created by people all over the world, on any topic, and can be shared through digital media with the whole world. Digital stories in this case are "multimedia sonnets of the people", in which "the photographs reveal the narrator, and the stories are collected, like pieces of a puzzle, a series of invisible historical events that, when viewed together, tell the story of our time, a story that shows who we are."

Another approach to the use of digital communicative technologies is the "computer as a tutor" model proposed by R. Taylor [26]. Training software based on this model plays the role of a teacher, presenting only educational material to students. This approach is successfully implemented in some countries, because it has several advantages: the repetition of the material is a useful and necessary component of the learning process; the computer is ideal for multiple reproduction, it cannot be bored providing the same material and evaluating the result immediately; the computer program ensures student's independent work, allowing them to study at their own pace, freeing classroom time for other activities.

Thus, the presented analysis of the existing approaches to the formation of cognitive activity by means of digital educational technologies is the methodological basis of the present study.

III. METHODOLOGY OF FORMATION OF COGNITIVE ACTIVITY WITH THE APPLICATION OF DIGITAL COMMUNICATIVE TECHNOLOGIES

The development of innovative technologies has caused the need to change the methods and means of teaching English. Vivid, memorable images created with the help of innovative digital technologies make it possible to provide a more comfortable perception of a new language and speech material. The digital form of presentation of the material allows you to use a wide variety of teaching methods, expands the students' horizons, forms their internal motivation to learn English, and a high level of independence. Digital communication technology is such a form of learning activity that demonstrates the visual support of a foreign language sound and visual range and contributes to a more accurate understanding of the seen or heard [2].

The traditional use of digital communicative technologies implies the creation of an artificial foreign language environment and the stimulation of students' independent speech activity. Digital learning technologies are designed for auditory, visual and visual-auditory perception of information. In the context of this study, we consider digital communicative technologies to be educational products placed in the Internet and aimed at creating the conditions for an artificial foreign language environment, the result of which is a separate communicative product. According to Zelmanov's classification of audiovisual teaching aids, digital communicative technologies are screen-based teaching aids that demonstrate the process of real communication [2].

The didactic value of these communicative learning technologies lies in high informational saturation, in rationalizing the presentation of educational material, in demonstrating the phenomena under study in dynamics and in illustrating real foreign language context. At the present stage of development of education, digital technologies can be classified on the basis of various criteria.

Let us consider possible classifications. By the source of information we single out phonograms (audio products) and video products. According to the information carrier we speak

about authentic and non-authentic or specially created products. By the speed of presentation of information we distinguish fast, medium and slow innovative audio-visual aids. Based on the presented classifications, it is possible to organize the selection of the corresponding digital products, taking into account the stage of foreign language learning.

The main technologies currently existing in cyberspace, suitable for being used in the process of a foreign language learning as training and educational tools, can be divided into two groups: 1) synchronous communication tools; 2) asynchronous communication tools. Means of synchronous communication are digital means that allow you to communicate in real time (chat, video chat and audio chat). Examples of such tools that provide the possibility of simultaneous communication via chat and voice communication are Skype and Yahoo Messenger. Asynchronous communication tools are digital tools that allow the exchange of information with a time lag (forums, email and audio mail, websites, blogs, wikis). An example of asynchronous communication is the so-called podcasts. The English word Podcast comes from the words i-Pod (MP3 player) and broadcast (broadcasting). These chat platforms offer new opportunities for improving oral speech skills [27].

Means of synchronous and asynchronous communication have great methodological potential in the context of the formation of cognitive activity due to the following reasons:
• they ensure the implementation of a differentiated approach in the study of a foreign language, depending on the individual characteristics of students;
• they provide possibility of multiple listening of the material in slow or in the original pace, because students are not limited in time;
• offer a selection of materials of interest to teachers and students;
• help organize autonomous learning connected with the traditional lesson of a foreign language due to the didactic integration of modern technologies;
• give opportunity of recording audio materials on various electronic storage media (mobile phone, CD-ROM, etc.);
• allow the user to work with educational material at any time convenient;
• constantly updated, they can be downloaded in the Internet.

The methodology of implementing digital communication technologies in the process of gradual formation of cognitive activity includes several stages.

The first stage of work is preparatory. This is a preliminary instruction, in the course of which practicing of lexical units is organized in order to create conditions for favorable perception of speech material and a communication aim is set.
The second stage is the initial presentation of the material with its subsequent comprehension and the primary discussion of its main idea.
The third stage is a re-presentation of the material, aimed at detailing the subsequent control of understanding.

The fourth stage is discussion and exchange of views based on the proposed content.
The fifth stage is the creation of an independent communicative product based on the material presented.
The sixth stage is a reflexive analysis of the degree of mastering the material on the basis of the communicative product created.
Seventh stage - guidelines for further self mastering of foreign language cognitive activity.

In the process of gradual formation of cognitive activity in order to develop speaking skills using digital communicative technologies, it is advisable to use the following types of tasks:
• reading aloud;
• expressing opinion on the content of audio and video recordings;
• discussion of the content of the created communication products;
• creating an oral diary;
• presentation of the results of the group product;
• verbal reviewing of the written text;
• role games.

According to N. Elukhina, there are a number of objective difficulties that prevent the solution of communicative tasks in the process of working with digital communicative technologies [28]:
• difficulties associated with the conditions of perception of foreign language speech;
• difficulties with the perception of the language form;
• difficulties associated with the content of the audio and video text;
• difficulties associated with the form of presentation of audio and video materials;
• difficulties associated with the perception of a certain type of speech activity and type of utterance;
• difficulties associated with mastering the sociolinguistic and sociocultural competence.
Many of these difficulties can be foreseen and eliminated through preparatory exercises before listening or watching the material.

Taking all of the above into account, we can conclude that the means of digital communicative technologies as media carriers are, along with other resources, an indispensable technical means of teaching the English language, allowing to solve complex problems of foreign language education. Let us name the advantages of using digital communicative technologies in the process of formation of cognitive activity in teaching English.

Communication products created in the process of implementing digital communicative technologies, provided they are posted on the Web, are available to all Internet users anywhere in the world. This means that students create communication products not for listening in the classroom, but for a wide audience. This is the main factor that stimulates the cognitive activity of students in the process of learning English. In addition, in the process of working on the creation

of a product, students pay more attention to pronunciation, the selection of correct lexical and grammatical units. The described digital communicative technologies provide new opportunities for organizing multi-level learning in groups. Students who feel insecure while speaking foreign language "face to face" feel freer when they work online.

Thus, new digital technologies have great potential both in the field of education in general, and for teaching English in particular. Easy downloading to mp3-players and iPods makes the process of learning English continuous and accessible not only in classroom but also in any other setting. The availability of audio and video recording programs makes it easy to create communication products. In addition, working with digital technology allows students to gain experience with lexical and grammatical material. This technology makes learning English personally oriented. Using imagination and creativity, teachers of English with the help of these technologies can achieve better results in comparison with traditional methods in shaping the cognitive activity of students.

IV. CONCLUSION

The introduction of digital educational technologies in the process of learning the English language contributes to the formation of competences in all types of educational activities:

• in learning activities (the elimination of gaps in knowledge, the formation of internal motivation to learning the language and independent learning activities)

• in independent cognitive activity of students (information search; its study, development of language and speech skills; creation of the final product);

• in educational activities (the formation of the correct ways to use the Internet, the formation of rules of conduct on the network).

It should be emphasized that the use of digital communicative technologies has a positive effect on the organization of the entire educational process, gives it greater clarity and focus in classroom and in extracurricular activities, including the system of additional education.

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