

Improving the process of integrated use of digital technology in education

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Abstract — This paper presents a specific hybrid product used in training that integrates several digital technology tools. To improve the process of integrated use of digital technology in education, the use of programs that makes it possible to use digital technology in education has been proposed. The programs iSpring Suite (iSpring Suite Trial), TTsReader and speech synthesizer, as well as the Loom-Video Recorder plug-in browser were involved in the work: Screen, Webcam and Mic. The operations made it possible to create a new algorithm for obtaining an off-the-shelf product for the educational process based on the integrated use of digital technology. Publishing a video lecture resource reference in the distance-learning environment Moodle makes it possible to use a lecture video course or any other video course in education created the same way. The resulting information product is user-friendly.

Keywords — *integration, digital technology, education, computer, internet.*

I. INTRODUCTION

The issue of the integration of digital technology in the process of teaching and learning has been studied from different angles for more than one year. As a rule, the limited use of technology was justified by the insufficient number of computers. In the modern world, the reluctance to introduce new technology in the process of education may be due to insufficient computer skills and fear. It should not be forgotten that the teacher's success in using a new technology for learning is partly due to their ability to find and develop certain relationships between pedagogy and technology.

The global changes related to the informatization process, set new requirements for both modern person and modern education. Nowadays, the changes in the education system force society to focus on a gradual transition to innovative learning.

The possibilities of using new information technology in the educational process are studied in the works of A.G. Hein [5], S.V. Panyukova [9], E.S. Polat [10], A.V. Sudakov [11], I.S. Konoplyova [6] and others.

The integration of technology should be considered along with other important issues of teaching and learning, such as the development of educational objectives, the choice of teaching methods, feedback and grading strategy. The technology used for teaching and learning should be

considered as an integral part of learning, not as an independent object. Education, like almost any other part of our society, has changed dramatically in recent years. Traditional teaching methods based mainly on the teacher's explanation of the topic and students' note-taking can still be useful in some cases, but today education revolves around the student in order to make them curious and motivated. The integration of technology involves the use of technology resources — computers, mobile devices such as smartphones and tablets, digital cameras, social media platforms and networks, applications, the Internet, etc. — in daily practical exercises and in the learning management. Successful integration of technology is achieved when the use of technology is regular and understandable, accessible and ready for problem solving, supports educational objectives, and helps students achieve their goals effectively. If the integration of technology goes smoothly, the student or the teacher does not think about whether he or she uses some kind of technology tool. Integration is a process when students not only use technology every day, but when they have access to various tools that meet the task and provide them with a deeper understanding of the content. The effective integration of technology is achieved when students have the opportunity to choose technological tools that will help them obtain information timely, analyze and synthesize information and present it professionally.

Online communication skills are becoming increasingly relevant with the development of information and communication technology and globalization. Although social networks are still blocked in many educational institutions, students around the world spend an enormous amount of time communicating in social networks. It is necessary to ably use popular resources in the educational process. When technological tools are effectively integrated into the learning process, they can expand the boundaries of learning. (A. V. Loginova) [7].

Many Russian didactics believed that when establishing integrative connections, it is necessary to ensure synthesis, integration of the parts into a single whole in the content of learning.

As a rule, software tools used in modern information technology have wide functionality, a developed user interface

and can be used independently in the form of computer information technology. (I.A. Malashihina) [8].

The educational process is rapidly transforming due to the wide availability of computer platforms for the production and distribution of digital content technology. The mixing of schoolbooks is currently one of the most popular methods for improving the efficiency of the educational process (A. Tatarczak, M. Medrek,). [3]

The development of information and communication technologies (ICT) in a relatively short period of time, taking into account changes in life, is not an exception in education. The world of education is considered to be the most important factor in the development of the quality of human resources necessary for generating a person who can compete in current globalization (YZ Miraj and others 2018) [4].

In addition, an increasing number of educational institutions have already integrated or are planning to integrate social media applications into their marketing plans in order to meet and attract prospective students, thereby showing a transition from traditional marketing methods. (Arghya Ray, and others). [1]

One of the most important tools for the integration of ICT in education, especially with tablet computers, was used in Turkey as part of the FATIH project. This study is aimed at determining the views of students on the use of tablet computers in educational and teaching processes. It turned out that students mostly use tablet computers to access the Internet. Students say that the content presented on tablet computers supports the topics in textbooks and that teachers encourage them in using tablet computers in the learning and teaching process. Students also agreed that tablet computers weaken communication between students and teachers. (Muharrem Duran, Tufan Aytac). [2].

II. RESEARCH METHODOLOGY

To improve the process of integrated use of digital technology in education, the use of programs that makes it possible to use digital technology in education has been proposed. The programs iSpring Suite (iSpring Suite Trial), TTsReader, as well as the Loom-Video Recorder plug-in browser were involved in the work: Screen, Webcam and Mic.

The iSpring Suite program integrates as an add-in to Microsoft PowerPoint and makes it possible to create HTML5 courses with tests, interactive actions, audio and video accompaniment, interactive simulators and screen recordings. The integration of the iSpring Suite add-in is presented in Figure 1. It is possible to create electronic materials while saving all the effects of a PowerPoint presentation by using the program. Added animations, transition effects, images and videos will remain unchanged when converting into web format. The HyperPoint technology, which provides conversion to HTML5 with saving PowerPoint effects in this software.



Fig 1. Integration of the iSpring Suite add-in in Microsoft PowerPoint

In our case, it was suggested to use the add-in in Microsoft PowerPoint to create a presentation with sound accompaniment of textual material and audio commentary to the visualization.

The TTsReader program makes it possible to convert text to speech. The program can be used both on a stationary computer during installation, and online on the official website of the program. It is possible to add TTSReader extension to the browser for free. The program features are text-to-speech, including male and female voices, different accents in different languages. An ability to save the result in mp3 and Wav sound files. The principle of the program is based on reading any text aloud using speech synthesizers with natural sound. Ivona Maxim, Ivona Tatyana, Acapela TTS Engine, as well as voice modules built into the Microsoft Windows operating system can be distinguished from speech synthesizers, or as they are called "voice engines", "voice robots".

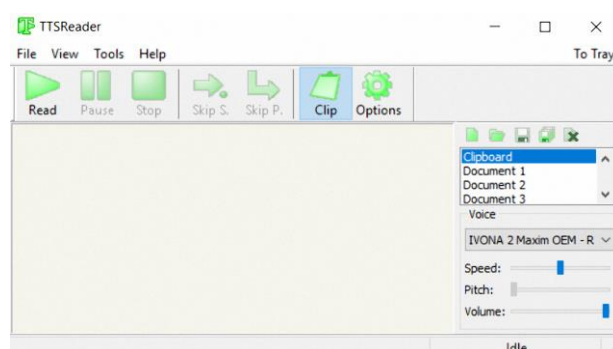


Fig 2. The TTsReader program with speech synthesizers

The Loom plug-in - Video Recorder: Screen, Webcam and Mic. is designed for integrating into the browser, it can be used to solve many problems. The program makes it possible to grab an image from the desktop, and with the help of a web camera it is possible to record video messages to the target audience. The use of the Loom extension is free. A URL is formed, link to the content created at the end of the video recorded. An essential condition for using the program is a gmail.com email registered. A video in an MP4 format is also available for downloading. Loom is available for downloading in the Chrome online store for free. From official information from the Loom program website (www.useloom.com), it is stated that 94% of respondents say that the program helps increase productivity, and studies show that video increases information latency by 54% compared to text, it really makes it the most effective way to share knowledge with everybody. Using Loom is possible in many areas of life. Managers - for communication in the company and building a culture. Managers use it for various speeches and team support. Marketers use it to collect feedback when conducting marketing research. Engineers use it to collect and describe errors and comments on them. Customer support services use it for video responses and real-time support. In education, Loom is used for teaching the target audience, using presentations, video lectures, summarizing the teaching. The Loom plug-in is depicted in Figure 3.

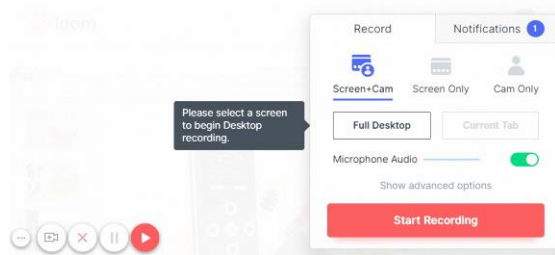


Fig 3. The Loom plug-in - Video Recorder: Screen, Webcam and Mic

Moodle, an open-source distance learning environment, was used to place a link to the resulting video content for general access in student learning.

III. RESULTS OF THE RESEARCH

The possibilities of add-ins, plug-ins and programs were considered after studying the experience of researchers from different countries on the use of digital technology in education and teaching: iSpring Suite, Loom, TTsReader.

The authors conducted a study on the integrated use of these programs in teaching.

The presentation of the necessary teaching material is created in Microsoft PowerPoint with the help of the iSpring Suite add-in. The possibility of the program applies to the sounding of the presentation material by the voice of the author of the lecture course or practical workshop. It is also possible to record videos using the webcam of the computer. This is a rather long and laborious process that requires certain efforts and skills, therefore, the TTsReader program with speech synthesizers was used to sound the text of presentations.

Two ways to sound were tested in studies. The first method involved recording an audio accompaniment in a presentation using a microphone and the TTsReader program. As soon as the text that had to be sounded for the presentation got into the clipboard, the program began to voice it automatically. The second method involved recording finished audio files from the text of the presentation slides or the text intended for the comments of the visual accompaniment of the presentations. The text was copied into the working field of the TTsReader program for this. "Tools" tab was selected on the program's taskbar; this tab provides text recording in the program's working field into an audio file in the Mp3 or Wav format according to the user's choice. The next step in the work performed is the integration of the capabilities of the reviewed programs for obtaining a presentation with sound accompaniment. Finished audio files of the presentation text accompaniment were opened for reproducing and sounding slides. After obtaining the sounded presentation file, iSpring resources were used to create

a video lecture which resulted in a video recording of the presentation in an Mp4 format. The resulting video file has both advantages and disadvantages. Positive factors include the ability to reproduce a file without access to the Internet. Nevertheless, there are many inconveniences and limitations, for example, the inconvenience of sending bulky files to the target audience of students associated with time and resource costs. It was decided to use the Loom plug-in integrated into the browser to overcome the inconvenience. In this case,

reproducing the obtained sounded video file of the presentation, the plug-in makes it possible to record information that is reproduced by the player on the desktop, if necessary, it is possible to add lecturer comments using a web camera and microphone. A video file is generated that is recorded on the servers integrated with the Loom plug-in at the end of the recording of the presentation content. A link that can be copied and sent or published for use by listeners is formed to the resulting video. Even in this case, the registration of students-listeners on services that provide the Loom plug-in is not required. The resulting link can be used to view video lectures from any device that has access to the Internet and makes it possible to reproduce video content. The process of recording a video presentation and getting a link using the Loom plug-in is shown in Figure 4. The plug-in makes it possible to edit the resulting content after the recording is finished.

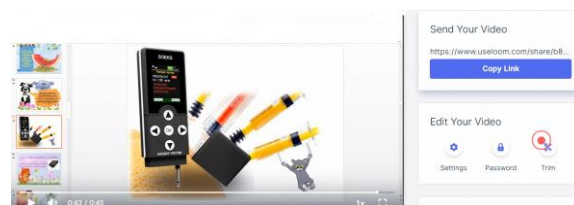


Fig 4. Forming a link to a video presentation using the Loom plug-in

The user of the Loom plug-in can see the link in their Google personal gmail.com account. The next step of the studies is the publication of the resulting link in the open source distance learning environment - Moodle. This environment is introduced for mandatory use in the educational process in educational organizations. A hyperlink to the resource appears after publication in the Moodle organization's environment. Students subscribed to this information course can, at any time and in any place providing the Internet access, use their personal data to log in the Moodle distance learning environment to use a lecture video course or any other video course created this way in their studying.

IV. CONCLUSIONS (INFERENCE)

Certain conclusions can be made after the conducted studies on the integrated use of digital technology in studying.

The use of programs like TTsReader with built-in modules of voice robots - software speech synthesizers, makes it possible to create voice accompaniment of presentations without the participation of a person sounding a presentation with their voice.

The integration of the iSpring Suite add-in program into Microsoft PowerPoint makes it possible to create presentations with sound accompaniment of textual material and audio commentary to the visualization.

Audio files created with the help of voice robots have been successfully used to sound presentations.

Forming a lecture video file from a sounded presentation is also possible by means of the iSpring Suite program add-in in Microsoft PowerPoint.

The Loom plug-in was used to create an electronic video lecture resource and form a link to the resource.

Publishing a video lecture resource reference in the distance-learning environment Moodle makes it possible to use a lecture video course or any other video course in education created the same way. The resulting information product is user-friendly.

The operations made it possible to create a new algorithm for obtaining an off-the-shelf product for the educational process based on the integrated use of digital technology.

V. DISCUSSION OF RESULTS

The created algorithm includes the sequence of the following actions: preparing a presentation in Microsoft PowerPoint, obtaining audio files of text content and presentation comments using the TTsReader program and speech synthesizer, sounding a presentation with the resulting audio files in the iSpring Suite program add-in in Microsoft PowerPoint and obtaining the video file of the sounded presentation, publishing a presentation video file using the Loom plug-in and getting a link to the resource, placing a link in a distance learning environment Moodle. It is possible not to use the Loom plug-in in this algorithm, but confine to the iSpring Suite resources, but then additional features of the program will be used. To activate them, you need to purchase a full-function program. A new created algorithm for obtaining a finished product for the educational process has several advantages.

One of the main advantages, in our opinion, is the use of voice robots which makes it possible to simplify the work on sounding. This is due to many human factors, both physiological and psychological. One can distinguish a good diction, a nice timbre of a voice, and finally good speaking skills from physiological factors. It is possible to distinguish psychological factors such as, uncertainty, rejection of your own voice when recording, constraint, etc. Not all people involved in educational processes have ideal indicators for this.

Another advantage of this algorithm is the simplicity of use. All used software tools are free to use, even taking into account the fact that, the set of functionalities is limited in free basic versions, they are quite enough to implement the resulting algorithm.

Besides, in our opinion, the use of this algorithm allows end users to use the product anywhere, and at any time convenient for them, the only condition is the availability of equipment with support for standard multimedia formats and the Internet access. These conditions at the present stage of development of the digital industry are not complicated, since not only stationary computers have access to the Internet now, but also smartphones, tablets, mobile PCs and telephones, access to the Internet from which is provided by cellular operators.

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