Theoretical and Methodological Aspects of Organizing Students' Independent Educational Activities, As Well As the Use of ICT And Related Tools

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Abstract: In the article the possibilities and classification of ICTs and tools that can be used in organizing students' independent study activities of higher education institutions has been explored. It is determined the students' independent study activities is individual, group, collective activity and is implemented within the process of education under the condition of no pedagogy's direct involvement. It complies with the requirements of the curriculum and syllabus and is aimed at students' acquisition of some social experiences in line with the learning objectives of vocational training. The analysis of the latest information and technological approaches to the organization of students' independent study activities made it possible to determine the means of realization of the leading forms of organization for this activity (independent and research work, lectures, consultations and non-formal education), to characterize and classify the ICTs and tools that support presentation of teaching materials, electronic communication, mastering of learning material, monitoring of students' learning and cognitive activity, such as ones that serve for the sake of development and support of automated training courses, systems of remote virtual education with elements of artificial intelligence, which implement the principle of adaptive management of learning and the organization of students' independent study activities.

Introduction: The globalization and informatization processes are widely recognized to have led to a steady increase in the volume of information, have significantly raised the intensity and power of information flows, have highlighted the problem of content, volume, logic, means and ways of organizing the mastering of knowledge and experience of humans in the higher education institutions. The problem of organizing the students' independent study activities has become a matter of importance and significance in the conditions of changes in educational paradigms from the concept of knowledge-oriented education "for life" to education through life, that is, continuous education, that is mainly carried out on the basis of person's self-initiative and activism [1, 2003, p 11].

Obviously, the nominal increase in the volume of students' independent work without introducing changes in the structure and content of the educational process has resulted in most cases in a decrease in cognitive motivation among students, impedes the development of important personality traits and characteristics, impacts on the specialists' competitiveness and their professional mobility, doesn't ensure appropriate evolution of students' abilities in learning throughout their life and doesn't allow them to master new technologies. In terms of information society researchers are seeing new wide perspectives in the active introduction of modern information and

communication and network technologies, computer based technology, tools of transfer and exchange of information. At the same time the development and mass application of ICTs is seem to have caused significant changes in the informational and educational spheres of a higher education institution [2, 2009, p 20].

By the thorough researches of the scientists in the past and present days it was found that the independent study activities are not only a continuation of the student's study work, but it is also conditioned and is means of forming the personality traits that are especially valuable for specialist-and-experts in their personal and professional self-improvement such as e.g. self-organization, self-actualization, self-identification, self-evaluation, self-control, self-reflection, etc. [3, 2008, p 28].

Evidently, in the context of reforming the system of higher education in Ukraine, due to the need to bring it in line with the best world standards the problem of effective designing and organization of independent study activities is acquired of particular significance. The documents of the Bologna process, international research projects as well as the adoption of the "National Qualifications Framework" (2011), the Laws of Ukraine "On Higher Education" (2014) and "On Education" (2017), etc. have become a powerful foundation for the conceptual changes in national educational system. It caused the revision of the traditionally formed basis of students' study activities in the direction of increasing their personal and competent orientation, activity and independence in the choice of goals and priorities, orientation towards the construction of individual educational trajectories [5, 1996, p 50; 6, 1986, p 61; 7, 2011, p 72].

Over and above, and also more extensive opportunities for academic mobility of teachers and students, the increasing role and importance of non-formal, distance and dual education, have led to the development of qualitatively new educational standards and programs as well as integrated and hybrid academic disciplines, which cannot be high-quality learnt without use of the modern ICT [1, 2003, p 12].

The purpose of the article is to explore the possibilities and classification of ICTs and tools, as well as to analyze the degree of productivity of their application in organizing students' independent study activities in

higher education institutions.

By virtue of the content analysis of initial categories, such as "information technologies", "computer based technologies", "communication technologies", as well as existing numerous researches, in the context of the investigated problem of organizing students' independent study activities we consider the ICTs as a systematic range of techniques and forms of knowledge acquisition and ways of learning on the basis of lecturer-student and ICT tools interaction aimed at the achievement of expected accomplishments of the educational process [1, 2003, p 10].

The essence of ICTs is represented as a system which includes: technical, methodological, substantive environment and software and hardware which accompany and support different aspects of the organization of students' independent study activities via appropriate ICT and tools.

Nowadays there are many software products, widely available open author's apps, cloud and local services that offer a variety of ICT and tools. They can be embedded in existing forms and what's more caused perfect methods of students' self-learning without any significant additional time expenditures. In our study, we consider ICT and tools in the scope of minimal, desirable and predictive ones. First of all, the basic ICT and tools include the software and hardware part of multimedia. There are PC, the input, output and communication devices, the devices of storage and transmission of large amounts of information and their software, and over and above the tools of mobile ICT. Additionally, we take into account such ICT and tools that enable the recognition and synthesis of human speech together with multilingual support. Offer you to consider further each group of ICT and tools in more detail [2, 2009, p 22].

The all existing diversity of software and hardware tools for creating and presenting certain educational content and general methodological support that students could use in their own autonomous learning may be united in ICT and tools for the presentation of teaching material.

To prepare the multimedia presentation today, the Microsoft PowerPoint product could be used, as well as applications for creating animated video presentations in the format of "hand drawn" (Algodoo, Sparcol VideoScribe, and PowToon), cloud services GoAnimate, Prezi, Google Slides, Zoho Show, Haiku Deck, Visme and

many others that allow not only to make presentations but also receive real-time help to improve them [3, 2008, p 29].

It is generally accepted that a learning book remains the most important source of knowledge. Theoretically, an e-book can be prepared using a text editor and, by means of hypertext technology, it can be structured for the benefit of quick navigation on it. At the same time, modern ICT and tools enable the creation of full-time didactic means for students' self-learning activities. There are both the simple HTML documents (HTML Help Workshop, HTML Help ActiveX control, HTML Help Viewer, Microsoft HTML Help Image Editor, HTML Help Java applet, HTML Help compiler, HelpMaker) and full-fledged textbooks in such formats as html, chm, pdf and exe that support speech, animation, video and simulation (SunRav BookOffice, eBooksWriter LITE, Help & Manual, Sophie, ExeBook, Maestro STANDARD, HTML Book Maker, Document X), as well as other leaning materials, trainings, courses, demonstrations, help manuals (Adobe Captivate), etc [4, 2005, p 40].

With the object of teaching materials' granting there are the repositories for data sharing and knowledge sharing, the educational resources, the electronic libraries, the file sharing networks (Usenet, Citrix), the knowledge bases, the distributed knowledge bases, the cloud storages (Dropbox, Google Drive, 4shared, Amazon S3, CloudMe, etc.) on the Internet [5, 1996, p 51].

Significant advantages for the organization of student's independent study activities are next:

— thematic channels of YouTube, where there are collections of video tutorials, presentations, educational videos, multimedia lectures, created directly by teachers and individual training centers (https://www.youtube.com);

— TED (Technology Entertainment Design) presentations, they are lectures collection on topics of science, art, design, politics, culture, business, global issues, technology and entertainment industry (https://www.ted.com);

— the Khan Academy, it is open online platform featuring short video tutorials (5-15 minutes) on various subjects as well as tests helping visitors to measure the level consciousness of leaning information (https://www.khanacademy.org);

— Wolfram|Alpha, it is knowledge base, a set of computational knowledge engine and a question-based system, containing, in particular, the necessary information for the mastery of engineering, technical, technological, computer knowledge (http ://www.wolframalpha. com);

— the services of corporate social networks (Podio, Yammer, Chatter, SocialCast, Bitrix24) that allow users to centrally store all working materials in one place, attach files and add comments;

— the services and tools for creating thematic websites for the demands of teachers and students (WordPress, Ucoz, Strikingly, Imcreator, etc.). They can build a site using a template set and in any case, they don't need web programming knowledge.

Among the virtual labs, one can identify those that function on the basis of software emulators reproducing software or hardware, or a combination of the work of other programs or devices, and simulation programs simulating the state of the modeled system for executing the original machine code [6, 1986, p 63].

It is supposed the examples of ICT and tools for the creation of virtual research and teaching laboratories are STAR (Software Tools for Academics and Researchers), VirtualLab, Algodoo, PhET, Wolfram Demonstrations Project, there are also many cloud services that enable users to directly conduct both virtual laboratory researches and to process mathematical statistics with applying their results (MATLAB, Statistics). It should be noted that these tools let to development and functionate full- fledged pedagogical software means for the methodological provision of students' independent study activities [7, 2011, p 73].

CAD system is a program for designing and issuance of working project documentation allowing to study project ideas and visualize concepts through photorealistic visualization, as well as to model the behavior of products in real-world conditions [31]. There are the most commonly used CAD tools - AutoCAD, NanoCAD, Compass 3D, FreeCAD, T-FLEX CAD, SolidWorks, Simulink, on top of the animation programs - Maya, 3ds Max, Corel Draw, CorelCAD, University MD Motion Bundle, etc.

The students' supervision from the direction of lecturers can be provided through a project management system. The service enables the reproduction of a complete design cycle: objectives and results trees, project life

structure phases, organizational structure of the project, matrix of distribution of responsibility and allocation of works between the performers (if the project is collective), network model of the sequence of project execution, resource tree, cost tree, description of project risks, etc. Among the ICT and tools supporting project management are Microsoft Project, Casual, Bullet Journal, Evernote, Trello, SCIM.ru and others [8, 2014, p 84].

Implementation of learning projects, conducting research in the network is being supported by Web 2.0 technology, through which such systems operate, that, by accounting for network interactions, they become the better, a lot of people use them [49]. These technologies, including the wiki, Google, Flickr, Digg.com, and blogging services, allow students to engage in self-search research on specialized sites as contributors, copywriters, critics, bloggers, commentators, etc. Therefore, together with the acquisition of educational information, this kind of independent study activity contributes to the formation of self-esteem, broadens the horizons, and develops students' communication skills.

In a nutshell we would like to cite the ICTs and tools as an example that could be used to build testing control of students' knowledge. These are MyTest, MiniTest-SL, ExeTest-SL, OpenTEST, Quick Exam, FreeXTest, Assistant, Test Designer, etc [9, 2019, p 34].

Furthermore, the Internet offers a number of cloud-based services that create on-line quizzes by virtue of the principle of gamification. The quite professional and versatile services in this respect are Kahoot (https://getkahoot.com) and Quizizz (https://quizizz.com) that contribute to build and conduct quizzes and surveys, with the use of mobile devices. The tool lets the test organizer adjust the tempo, speed, time limits for each task, and add additional marks for the estimation of speed or sequence of tasks performed by each student [10, 2015, p 37-70].

Certainly, above we considered the most well-known and promising ICTs and tools in terms of organization of students' independent study activity.

At the same time, we would like to emphasize specially created ICTs with educational purposes, they are integrated ICT and tools that cover all of the above listed aspects of organization students' independent study activities.

These include Internet technologies and SaaS (software as a service) cloud-based technologies. They allow storing data and associated applications on specialist servers that let solving the tasks of organizing students' independent study activities. The most common are Microsoft Office 365 Education and Google Apps for Education, as well as cloud-based services have been made on their basis. Their benefits are next: they are either full or in a practical manner free as well as availability and widespread [10, 2015, p 71].

In particular, the Google Apps for Education cloud platform offers the following ICTs and tools: text, voice, and video, chat, email; Google Drive - a data warehouse (15 to 30 Gb) for storing files, setting access rights to them with the possibility to post to the Internet; as well as a number of tools - Google Docs for making documents, spreadsheets and presentations; Google Group to create mailing lists and discussion groups; Google Calendar - a calendar for planning and managing meetings, tasks, and event sharing; Google Forms for surveys and tests, Google Sites - for generation sites using templates. It should be taken into account the fact that the list of tools is constantly expanding.

In the educational process today, various platforms for managing integral training courses are being actively used, including Moodle, Claronline, ATutor, SharePointLMS, Live@EDU, eFront, Prometheus, Dokeos, etc. Their advantages and disadvantages are considered in detail in their publications of and many others [10, 2015, p 72].

Among the principles of social constructivism, which is the basis of the LMS project, we emphasize one very important for our study, it is the opinion that the learning environment should be flexible and should provide a simple tool for the participants in the educational process to fulfill their learning needs. This certainly makes LMS a powerful tool for organizing students' independent study activities [9, 2019, p 94].

What's more, there are commercial Blackboard, WebCT, Microsoft Learning Gateway, Prometheus, WebTutor, Virtual University, and freeware ATutor, ILIAS, Sakai among widespread virtual learning environments. The distance education functions on these platforms and creates chances for organizing students' non-formal

education.

It is a peculiarity of online education that students and lecturers are separated in space and time, and the interaction between them takes place in a virtual environment. Online Educational institutions are commonly referred to as "virtual universities". Their functioning is being based on the four systemic principles of open education: they are formulated by Valerii Yu. Bykov, namely: mobility of subjects of the educational process; equal access to educational systems; providing quality education; formation of the structure and implementation of educational services [9, 2019, p 55-56].

Massive open online courses (MOOC) allow students to be taught by lecturers from leading world universities, to join a multinational student community, and to receive a document confirming the successful completion of the entire course. The largest online platforms offer electronic lessons with subtitles and printed learning material; video materials; enable conduct a meaningful evaluation of the knowledge gained. To help the student methodical and reference material is given, the opportunity to discuss learning issues and tasks at the forum is added, credit for regulate the speed, the pace of training are taken. They are Coursera, Khan Academy, EdX, Udacity, Canvas Network, Udemy, FutureLearn, FUN, Prometheus on-line platforms that provide such user-friendly courses.

When all's said and done above we mark that the processes of ICTs' unification and universalization of eventually ensured the development of various types' separate universal training modules. Ones could be part of several technologies for the organization of students' independent study activities [9, 2019, p 85].

The technological basis of such websites can serve as specially developed platforms for distance learning that are provided to the user almost for free: they are Moodle, Google services, Edmodo, Studyboard, etc., and moreover ordinary social networks. In their structure, the main features of management of students' independent study activities are laid.

When creating a site, a specialist programmer uses specially designed programming languages (PHP, HTML, JavaScript, etc.). However, a website builder tools can generate a site applying user-friendly simple settings. There is the possibility of making sites, both on the basis

of Content Management Systems (CMS) and applying SaaS platforms, although in this case, the service is paid [10, 2015, p 75].

It is observed that the organizing of independent study activities with the use ICTs tools is considered an effective one if the students gain a certain amount of knowledge at the appropriate general scientific and professional level, forming the important features of their personality, necessary for further intellectual and professional development. At the same time, the independent study activities has been carried out on the basis of selfmanagement by students and the systemic indirect mediated management by lecturers as well as rates of mental labor, sanitary and hygienic and ergonomic requirements in the application of ICTs have been taken into account.

The effectiveness of the organization of students' independent study activities can be assessed by a number of criteria. Obviously, the students' motives and motivation determine their personal meaning, are the main factors of one's effectiveness, especially in terms when the classroom training has been reducing. Starting independently, based on their needs, the student has put forward a specific goal. Therefore, the goal is being defined as a conscious need, as a marking of a desired result that is being directed the student's activity towards achievement it. Thus, activating the students' cognitive interests, initiating their creative initiative, and the desire to perform the proposed learning tasks in a qualitative and timely manner, to master and apply for the sake of these newest ICTs is the first urgent step in organizing an effective students' independent study activity. The next step is to build a content and instrumental basis for independent study activities. This involves, firstly, the formation of students' teaching and methodological knowledge for the organization of autonomous learning, as well as methods, techniques and skills for solving the set of educational tasks with the wide application of ICTs. In the end, the effectiveness of the functioning of such a system is assessed by educational, cognitive and personally significant products of students' independent study activities.

In addition, the didactic supply of the organization of students' independent study activities of technological and pedagogical area of expertise with the use of ICTs and tools have been created and adapted. They were the electronic educational content, if in a nutshell -

electronic lectures, electronic educational books, electronic educational kits and whatever. At last the electronic, mobile, combined, mixed learning technologies as well as ones of training, coaching, gaming, design, test, rating have been tested and endorsed [10, 2015, p 76].

It has been tested the models of blended learning. First of all, it was the stream model that via an educational web-site has concentrated in itself an invariant core of students' independent study activities and has integrated with traditional technologies through so called model "Flipped classroom". The potentials of axial model that included user's custom electronic courses of curriculum disciplines as interactive educational modules on the Moodle platform has been studied. The variety of ways for mixed self-study learning has also been implemented [9, 2019, p 98].

Consequently, the analysis of the latest information and technological approaches to the organization of students' independent study activities made it possible to determine the means of realization of the leading forms of organization for this activity (independent and research work, lectures, consultations and non-formal education).

In the current context, when the development and replication of educational software products becomes a business, the market is being filled with quite diverse and multiple products. Identification of the criteria for their quality and selection is getting increasingly issue of the day. Often, the criteria for such an assessment are the technical characteristics of software products that not directly related to the pedagogical and methodical terms for their creation. The quality of graphic design, reliability, availability and quality of documentation, etc. - all these criteria are definitely important, but in our opinion, they do not determine the main characteristics of educational software products. Therefore, the programmatic and methodological support of students' independent study activities based on ICT should include both software tools for teaching support and means that enable the lecturer to manage the learning process, its rational organization.

As for result of this study, the ICTs and tools for the organization of students' independent study activities have been characterized and classified. It was shown and described the ICTs and tools that support presentation of teaching materials, electronic communication, mastering of learning material, monitoring of students' learning and cognitive activity, such as ones that serve for the sake of development and support of automated training courses, systems of remote virtual education with elements of artificial intelligence, which implement the principle of adaptive management of learning and the organization of students' independent study activities [8, 2014, p 83].

In this publications the elements of the system of pedagogical work on the creation of informational educational environment of higher educational establishments functioning on the basis of the same educational principles in the process of organizing students' independent study activities with the use of ICTs and tools have been presented. The content and functional components of such a medium have been developed and tested in the framework of pilot-and-experimental work. They have enabled to effectively implement the leading forms and technologies via appropriate ICTs and tools, as well as have given statistically significant dynamics in the levels of organizing students' independent study activities in line with for productive and technological ability criteria [8, 2014, p 84].

Summarizing the analysis of the possibilities of integrating traditional and newest ICT into the organization of students' independent study activities, take credit that not only ICTs are important, but how their use serves the achievement of educational goals. Usually, the best educational result is being provided by a feasible combination of well- proven time traditional and innovative means of organizing students' self-study. Expediently, when ICT are being selected one should take into account their maximum compliance with the specifics of the students' training in a particular area of expertise.

Perspective in the development of this area, we consider the research content of students' independent study activities in the distance, dual and e-learning educational systems.

REFERENCES

1. Bendera, I.M.: The theory and methods of future specialists in agricultural mechanization individual work in educational institutions. Dissertation, The Pedagogical education institute and adults'

education APS of Ukraine (2009)

2. Boiko, N.I.: Formation of skills and abilities of pedagogical university students independent work by incans of library technologies. Dissertation, National Pedagogical Dragomanov University (2008)

3. Demyda B., Sahaidak S., Kopyl I. Distance learning systems: review, analysis, choice). Bulletin of the National University "Lviv Polytechnic", Computer Science and Information Technology 694, 98-107 (2011)

4. European Centre for the Development of Vocational Training: Terminology of European education and training policy. A selection of 130 key terms. Publications Office of the European Union, Luxembourg (2014)

5. Spencer, L.: 16 Over 20 Best Presentation Making Software Alternatives to PowerPoint (2019). URL: https://business.tutsplus.com/articles/best-presentation-softwarealternatives-to-powerpoint--cms-28697 (2019). Accessed 25 May 2019.

6. Striuk, M.I., Semerikov, S.O., Striuk, A.M.: Mobility: a systems approach. Information Technologies and Learning Tools 49(5), 37–70 (2015). doi: 10.33407/itlt.v49i5.1263.

7. Khidirbaev, S. (2023). Methods of improving student-centered and competency-based approaches in English classes. Science and innovation, 2(B3), 142-145.

8. Yeraliyevich, K. S. (2024). Development of models of communicative competence in higher education institutions. xalqaro ilmiy-amaliy konferensiyalar, 1(2), 497-502.

9. Yeraliyevich, X. S. (2023). Oliy ta'lim muassasalarida talaba shaxsiga yo'naltirilgan va kompetensiyaga asoslangan yondashuvlarni takomillashtirish metodikasining mavjud holati. so'ngi ilmiy tadqiqotlar nazariyasi, 6(3), 86-91.

10. Xidirbaev, S., & Abdurahmanov, D. (2021). Theoretical and methodical aspects of the organization of students' independent study activities together with the use of ICT and tools. TJSS-Tematics Journal of Social Sciences, 7(2).

11. Abdurakhmanov, D., & Khidirbayev, S. (2021). ICT in learning a foreign language: from a traditional textbook to a virtual learning environment. Herald pedagogiki. Nauka i Praktyka, 1(1).

12. Yeraliyevich, X. S. (2023). Talaba shaxsiga yo'naltirilgan va kompetensiyaga asoslangan yondashuvlarni takomillashtirishga ta'sir etuvchi omillar. Innovation: The journal of Social Sciences and Researches, 1(6), 197-201.