

DIGITALIZED LEARNING AND ITS EFFECTIVENESS IN TECHNOLOGICAL EDUCATION

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Abstract. *The essence of the development and implementation of the "Digital Uzbekistan - 2030" program is to develop life skills in students, to raise their professional training to the level that meets the requirements of the world labor market by making them use modern technologies effectively.*

In order to adapt the educational process to world standards, educational production workshops, practical and laboratory classrooms are equipped with modern furniture, equipment, educational materials, laboratory equipment, a complex of computer equipment, the Internet, video surveillance systems, distance learning. one should not forget that provision of teaching equipment, 3D printer and taking measures to update them in time is an integral part of this process.

Keywords: *3D printer, ARM, Learning from AR/VR, Gamification, AIK.*

The level of equipment of training facilities meeting the requirements of international standards is one of the most important factors in the development of knowledge, skills and abilities of students studying in the field of "Technology".

At the same time, the widespread introduction of the electronic library system, which is an integral part of modern education and allows for remote access, will allow students to use the library fund and information bases after the institution of higher education allows to increase.

The development of knowledge, skills and competences from subjects in the field of technological education is directly relevant to the following factors [1]:

higher education institutions with modern software products, to create effective mechanisms for regularly providing educational and scientific processes with educational and laboratory equipment, as well as laboratory materials (necessary materials and other objects) in the necessary quantities;

timely provision of the growing need for infrastructure objects of information resources (ARM), training workshops, laboratories and strengthening of their material and technical base based on the requirements of the time;

establishment of innovative ARMs, regular enrichment of their book fund with new generation educational literature;

continuous provision of higher education institutions with high-speed Internet, expansion of infrastructure opportunities for independent education of students;

it is necessary to implement the necessary tasks, such as expanding the opportunities for free use of electronic educational resources, electronic catalogs and databases of modern scientific literature for students, teachers and young researchers.

Improving students' access to digitized learning resources creates many great opportunities for educational institutions and educators to integrate some form of digitization into the classroom,

making teaching and learning more effective. Among the main advantages of using digitization in educational classrooms:

The introduction of digital educational resources into the classroom will increase the interest of future teachers in the subjects being taught to students. Educative resources provide a variety of opportunities to make learning more interesting and engaging in terms of teaching the same things in new ways. For example, teaching through games, taking students on virtual tours, and using other online learning resources. In addition, technology can encourage more active participation in the learning process that is difficult to achieve through traditional lecture environments.

Students who are engaged and interested in what they are learning are expected to retain their knowledge better. As mentioned above, technology can help encourage active participation in class, which is also a critical factor in increasing retention. Different forms of technology can be used to experiment and decide which is best for students in terms of retention.

Because of different learning styles and different abilities, no one learns in the same way. Digitization offers great opportunities to make learning more effective for everyone with different needs. For example, students can learn at their own pace, review difficult concepts, or jump ahead as needed.

Students can practice collaboration skills by participating in a variety of online activities. For example, working on different projects by collaborating with others in forums or sharing documents in a virtual learning environment. Digital learning resources can encourage collaboration with prospective teachers in the same classroom, within the same education system, and even in other audiences around the world.

Students can learn useful life skills through integrated learning resources. By using integrated learning resources in the classroom, both teachers and students can develop the skills needed for the 21st century. Students can gain the skills they need to succeed in the future. Modern education is about cooperation with others, solving complex problems, critical thinking, developing different forms of communication and leadership skills, increasing motivation and efficiency. In addition, technology can help develop many practical skills, including creating presentations, learning to distinguish reliable from unreliable sources on the Internet, maintaining proper online etiquette, and writing e-mails. These are very important skills that can be developed in the audience.

Countless online resources can help improve teaching based on the universal educational resources. Prospective teachers can use a variety of apps or reliable online resources to enhance traditional teaching methods and engage students more. Virtual lesson plans, assessment software, and online assessments help teachers save a lot of time. This valuable time can be used to work with struggling students. In addition, the availability of virtual learning environments in schools improves collaboration and knowledge sharing among teachers.

Computer literacy knowledge, pedagogical software tools and multimedia presentations in teaching processes is recognized as the main factor for achieving the intended goal. In this process, that is, in the process of changing the teaching and learning methodology, the digitized educational resources provided for use include:

Initially, educational institutions used programs such as Zoom and Google Meet in the process of conducting video conferences for classes. In this process, the institutions participated in the attendance of students and conducting online examinations. But now, organizations can

integrate their websites with these resources and overnight, through technology advances, recreate a seamless classroom experience on a digital basis.

Learning from AR/VR. Augmented and virtual reality is gaining ground in education. Augmented reality is an immersive environment in the physical world where computerized perceptual knowledge enhances real-world artifacts. Virtual reality, on the other hand, is a simulation of a 3D environment that people can interact with using VR glasses or headgear. These technologies bring to life such subjects as history, geography, technology, biology.

Gamification. Teachers help kids stay focused on topics through great learning strategies. Gamified education is very common in K12 education and is slowly spreading in the technology education and testing sectors.

Intellectual exam portals. There are also several difficulties in teaching and assessment in higher education institutions. Often students struggle to pass unfair exams. To avoid this, institutions should include webcams in their online exam portals. This will help you track suspicious activities like opening tabs, background chat, photo sharing, etc. while taking the exam.

Educational platform. Think of the learning platform as a student's mental guide. Unlike a learning management system (LMS), which offers a one-way learning roadmap, a learning platform offers autonomy. For example, LMS gives 1,2,3 etc. in the order. On the other hand, an educational platform provides content that is curated according to students' pace and preferences. The learning platform offers the option of a curriculum stream rather than a pre-defined curriculum.

In the pursuit of individualizing education, technology empowers students by taking ownership of how they learn, adapting education to their digital lives, and preparing them for the future. With technology and access to resources outside the classroom walls, students are inspired to be problem solvers, critical thinkers, collaborative and creative.

Teachers are always striving to individualize learning for students. Technology helps them achieve breakthroughs with real-time access to student data, content, apps, and more. Technology helps teachers create blended learning environments and use digital tools for formative and summative assessment, bringing new models of learning and teaching into classrooms.

Technology in education and the right devices in the hands of students help prepare them with the professional and technical skills to succeed in today's and tomorrow's workforce [41].

Therefore, it is necessary to develop integrated educational technologies and apply them at different levels of education: from preschool to higher educational institutions. It is very important that teachers have not only the art of teaching, but also the technology of teaching as the basis of this art [43].

The content of teaching "Technology" in modern education is the main directions of using modern pedagogy: computer literacy, classroom management and direct involvement with student education. The first is related to technology as a discipline. The second field of application is focused on the organizational problems of teaching, which should be considered in the context of teaching technology. The third area concerns both teaching and learning technologies.

Computer technologies that use computers as teaching or learning tools constitute a specific class of educational technologies. Therefore, it is more effective to consider computers as part of an integrated technology.

Currently, the effectiveness of using computers in education is low compared to the various equipment provided by modern computers. This is because, as a rule, there are very few integrated

computer-based technologies. Only computer - aided learning methods and instructions are developed. However, this is not enough due to the variety of side effects. These effective methods and instructions are ignored at the level, but are considered at the technology level. Therefore, the introduction of a technological approach to learning and especially to teaching is very urgent [49].

By introducing digital technologies and modern methods into the process of technological education, the following activities are carried out in the formation of the innovative infrastructure:

- modern digital technologies and educational technologies, creating additional conditions for the continuous development of the professional skills of pedagogical personnel in this regard;

- individualization of educational processes based on digital technologies;

- in order to download and copy electronic books on multimedia technological education to mobile devices, information about educational-methodical complexes (textbook, exercise book, teacher's manual, appendix of textbooks) in the section of classes using QR-code creating a placement system;

- organization of distance education programs based on modern information and communication technologies;

- use of platforms (interactive-virtual educational program) and innovative technologies in educational processes that allow online monitoring and mastering of EDU market theoretical and practical training, as well as uploading them to electronic information storage devices;

- educational-methodical complexes, electronic education resources and their use in the electronic library system that allows remote access;

- to gradually increase the weight of electronic resources in the educational process, to create electronic educational literature, to create a system for placing information about electronic resources using QR-code in order to download them to mobile devices;

- based on the uniqueness of technological education, development of the use of modern software products widely used at the international level in the educational process;

In addition, the following activities will be carried out on the formation of the innovative infrastructure of technological education:

- step-by-step introduction of commercialization of the results of creative projects created by students;

- paid services and establishing budget and techno parks, technology transfer, start-ups, accelerators based on the socio-economic development of the regions at the expense of other external funds for sites and ensuring their operation;

- to encourage wide involvement of highly talented students-young people in science on the basis of startup projects;

- talented students-young people, training on the basis of in-depth educational programs, attachment to qualified specialists who have achieved high results in the relevant field on the basis of the "Master-Apprentice" system;

- Organization of science Olympiads in the general secondary education system on the subject of "Technology" and increasing the participation of talented students;

- innovative infrastructure and integration with pre-school, primary, secondary and secondary special professional education and higher education systems and so on.

The main problem with digitalization in educational systems is that they are not compatible with modern digital technologies for their development. This inconsistency means that the current

integration system needs to be updated, adapted or replaced, which inevitably requires time and resources [107].

It is called "Digitalized educational resources" as a collection of special electronic programs for learning by means of modern digitized educational resources, independent education and control of acquired knowledge, skills, qualifications and competences.

Digitized educational resources include digitized information technology tools and materials that allow virtual and automatic visualization and implementation of technological processes aimed at the development of competencies, taking into account the individual capabilities and characteristics of the learner. It is understood the process of delivering to the student with the effective use of didactic materials for the purpose of control.

Digitization - Digitization in politics, business, commerce, industry and media is defined as " technical process ". *Converting analog data into* digital form (i.e. digital, binary format, like zeros and ones), the old term *digitization is* still used in the original sense of the term. Most electrical devices are analog - digital converter eg scans, samples images or sounds get (e.g. music samples) and measurement data. This term can also refer to the digitization of information in the right hand, for example, analog to digital Digitizing images using a converter including tablets. Digitization is technically defined as the representation of signals, images, sounds, and objects by creating a series of numbers expressed as discrete values and represented by binary digits. *Digital software tools* - software or Software is a tool designed to perform a certain type of task on a computer. This is understood as a set of software and documentation tools for creating and using data processing systems with computing tools. It was this software that destroyed the term computer - "dry iron". Digital software is a set of all programs used by a computer. In English, this term software means " soft " and " ware " means " product ".

Digitized software is divided into 3 groups:

1 - utility programs (it includes programs that perform various auxiliary tasks: Task Manager (available in Windows OS));

2 - financial (it includes programs that provide the user with data processing and processing in a specific field of use, for example: Microsoft Office, Adobe CC);

3 - it's custom programs (these are the programs used for programming)

The reception, storage and transmission of digitized educational resources can be classified as follows:

digitized files - representation of simple electronic materials in the form of files (word documents, text documents with tables and graphic illustrations, materials in the form of presentations, virtual simulators, graphic files of illustrations, audio-video format files, etc.);

digitized didactic materials consisting of elements of electronic educational literature used from information systems and multimedia components, educational and methodical manuals, methodical recommendations and electronic educational resources.

Digital learning resources can be divided into several types:

digitized informational educational resources;

educational resources used in the processes of organization, management, and control of the educational process.

Structural components of digitized educational resources:

digitized educational literature (electronic textbook, study manual, methodical recommendation, lecture texts, educational-methodical collections);

normative educational documents: professional standard, state educational standard, curriculum, educational programs, lesson plan, science program, working program;

digitized didactic tools: demonstration weapons, realistic, technical and printed tools, training scenarios, didactic materials, training presentations, posters, audio and video materials, virtual trainers, animations , etc.

media resources: virtual trainers, virtual tours, virtual exhibitions and digital libraries, etc.

Digital Literacy - We need to improve digital literacy by testing and documenting future teachers' ability to properly use and evaluate digital resources, tools and services and apply them to lifelong learning processes. From the point of view of future teacher education, in developing digitally literate students as a competitive workforce, it is generally necessary to prioritize technical skills in the use of digital tools and systems appropriate to the educational context, and to provide them with a specific education. means figuring out how to use them.

The digital transformation of education is the renewal of planned educational outcomes, educational content, teaching methods and organizational forms, as well as improving the educational outcomes of each student in a rapidly developing digital environment and evaluating the results achieved.

Digital transformation changes the way the education system is developed and in some cases creates completely new methods of education. With digital transformation, educational organizations are taking a step back and rethinking everything from internal systems to the online and in-person interactions of prospective teachers.

Digitized learning resources provide the following benefits:

Ensures efficiency and consistency by improving efficiency;

Improves the educational process ;

Increases the labor productivity of students ;

Facilitates continuous integration between all forms of education;

Meets the requirements of teachers and students;

Creates strategies for the development of an appropriate educational system.

Identifying the technology required for a digital transformation environment. Looking at the many forms of digital technology available today and seeing which one is the best fit. These include:

Big data ;

Cloud services ;

Mobile technology ;

Internet of Things ;

Artificial intelligence ;

Robotics ;

Additional production ;

Web technology .

Create a timeline and roadmap with key performance indicators. This step requires a clear timeline. It is necessary to use AIK to monitor performance. This roadmap also includes what software the company will need and which departments will get it, how the applications will be interconnected, what the new data structure will look like, and so on. takes

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Conclusion and suggestion: The article analyzed the problem of digitization and effective use of educational resources in the development of professional competence of future "Technology" teachers as a pedagogical problem. In this regard, how students can influence the educational process, on the basis of digitized educational resources in the digital age, pedagogues should first of all use their scientific and theoretical knowledge to increase the educational efficiency of future teachers of "Technology" It was analyzed that it is one of the urgent problems of the present day that it is the need of the hour to work on materials, to create educational materials in various forms by connecting them to practical training processes.

A variety of frameworks, models, and literacies have been developed to guide teachers in their efforts to build digital skills in their students that will help them use new and emerging technologies in the future. In general, these are pedagogical, content, and educational approaches that are seen as supporting the integration of digital resources into teaching to enhance students' skills in using "educational" applications and information from digital sources, or to enhance learning outcomes in subjects. aimed at understanding the effective combination of technological knowledge. There is an assumption that courses that develop these skills in teacher education institutions are usually offered as stand-alone subjects, or they are created through the integration of technology into other subjects or through mandatory assessment. However, significant existing research shows that the current narrow focus on science-related technical and informational skills does not adequately prepare students with the breadth of knowledge and skills needed in today's careers and beyond. Provides a conceptual framework that provides an expanded view of teacher digital competence. It goes beyond the widespread concept of technical and literacies and argues for more holistic and broader concepts that recognize the increasingly complex knowledge and skills that young people need to work ethically, safely and effectively in diverse, digitally mediated environments. Discussion of the results of digital technologies introduced into the educational system, its interdisciplinary nature and the need for the purposeful and intentional involvement of all professors and teachers in achieving their goals. The content of the proposed methodology on how to develop the professional competencies of teachers in the environment of digital transformation is presented in the next chapter.

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