

TECHNOLOGICAL APPROACH TO THE DESIGN OF INDEPENDENT LEARNING IN THE DISCIPLINE OF “INFORMATION TECHNOLOGIES IN EDUCATION” IN ORDER TO IMPROVE THE QUALITY OF EDUCATION IN HIGHER EDUCATION INSTITUTIONS

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Abstract: In this article, the theoretical aspects of teaching in an online learning environment are discussed, in line with information technology programmers in education. It also presents a methodology for using electronic platforms to assist students in managing the independent study hours allocated to subjects within a modular credit system in higher education institutions. In addition, students can use these platforms during training sessions to master independent learning topics. Through this article, students can get advice and answers to their questions that can help them in organizing independent learning in different types of higher education settings.

Keywords: LMS, E-learning, ICT. Moodle platform, EE, HEU, IT in E.

Introduction

In the era of modern pedagogical technologies, in the conditions of a credit-modular system of teaching, it is possible to reform the basic educational process in order to increase the effectiveness of education in the organisation of independent education of students of higher educational institutions through electronic platforms. One of such modern pedagogical technologies is the activation of LMS Moodle e-learning through management platforms. Organisation of independent education of students through the electronic platform Moodle. Intensification of the indicator of the quality and effectiveness of independent education is an increase in the pace of learning without reducing the requirements for the quality of knowledge achieved by improving the content of educational materials and teaching methods. [Ismatovna, A. Y. (2021)].

In modern conditions, the method of organising independent education of students through the electronic platform Moodle is to create didactic and psychological conditions for meaningful study of the strategic direction of activation and activation of education, to involve students in this process not only at the level of intellectual, but also at the level of social and personal activity. [Ismatovna, A. Y. (2021)].

In order to increase the effectiveness of education it is important to create psychological and pedagogical conditions in which the student takes an active personal

position and fully manifests himself as a subject of educational activity. In the educational environment there are different motives, which are divided according to what is the basis of motivation: motivation or the need to know. In traditional teaching, students form two groups of motivations [Ismatovna, A. Y. (2022)].

1. Direct motives. They may arise in the student because of the teacher's pedagogical skills which create interest in the subject. These external factors reflect interest, not the motivation of the cognitive plan. Promising motivational motives can arise when the teacher explains to the students that it is impossible to master the following material without mastering this section, or when the students form a motive to study in connection with the upcoming science exam; or, if you want, to do perfectly in the session in order to get a nominally higher scholarship. In this case, the cognitive activity is only a means to an end that is beyond the cognitive activity itself. In addition to active forms of education, a new group of motives appears.

2. Cognitive motives of knowledge seeking, acquisition. Interest in learning arises in relation to the problem and is used in the process of mental work associated with searching for a problem or group of tasks and finding a solution. On this basis, there will be an internal interest in the acquisition of knowledge.

As a result, cognitive motivation emerges, and when active teaching methods are used, it becomes a factor in activating the learning process and learning effectiveness. Cognitive motivation motivates a person to develop his own inclinations and abilities, has a decisive influence on the formation of an individual and the opening of his creative potential. With the emergence of cognitive motivational motives, it is necessary to rebuild perception, memory, thinking, redirect interests, activate human abilities, create necessary conditions for successful implementation of the sphere in which he is interested [Ismatovna, A. Y. (2022)].

The continuous development of technology, especially information and communication technologies (ICTs), has made it possible for great advances to happen toward higher education, as well as for the development of teaching experiences of much higher quality (Barakabitze et al., 2019; Pinto & Leite, 2020). ICTs prepare students for the challenges of today's world. (Mora et al., 2020). These technologies take advantage of the characteristics of a new type of student, who is considered a digital native. This usually demands the application of non-traditional teaching/learning strategies [Hakkarainen, T. et al. (2024)]

Emerging technologies such as machine learning, virtual, mixed or augmented reality, additive manufacturing or 3D printing, and smart mobile devices, are increasingly common elements within the classroom, not as the field of study itself, but as teaching support tools. Their use should be oriented to maintain and increase the effectiveness of the implemented pedagogical methodologies, which often requires the acquisition of new digital skills and competencies by all involved.

According to Kim et al. (2022), students find the use of technology particularly useful when directly related to their courses or when they are learning about abstract concepts. University students' perceptions of the use of different types of technologies to support their formative process, and in similar learning environments have been little addressed in the scientific literature. That is why the present study describes the perceptions of engineering students about stimulated motivation. For this purpose, an experiment was designed in which different types of ICTs were used as main support tools for the learning process, under similar environments [Hakkarainen, T. et al. (2024)].

Electronic learning (e-learning) gained major traction during the COVID-19 pandemic in all educational spheres and academic institutions, ranging from contact to open-distance universities, and there has been a dialogue about the narrow definition of the concept of e-learning (Choudhury & Pattnaik, [2020](#); Selwyn, [2023](#)). Consequently, studies (Rodrigues et al., [2019](#); Selwyn, [2021](#)) define e-learning as the process of teaching and learning accredited course content through electronic platforms ranging from Web 0 (read-only online platforms) to Web 4.0 (artificial intelligence platforms). This suggests that e-learning is all about the use of e-learning platforms to consume and produce knowledge and skills in the educational curriculum outside the traditional/face-to-face platform. Research (Greenhow & Chapman, [2020](#); Lee & McLoughlin, [2010](#)) further shows that the technological revolution in open distance and e-learning (ODEL) institutions started in the early twentieth century, when purely print-based correspondence models of teaching and learning were initially used. However, Onggirawan et al. ([2023](#)) concur with Selwyn ([2021](#)) that in the mid-twentieth century the rise of multimedia teaching integrating the use of print with broadcast media, cassettes, and micro-computers was adopted and used. Recently in the twenty-first century, open-distance institutions have integrated emerging educational technologies, which include but are limited to formal e-learning platforms (learning management systems (LMS), video conferencing applications (VCA), digital libraries, etc.) and informal e-learning platforms (social network sites (SNS), YouTube, etc.) (Bates, [2015](#); Mpungose, [2023](#)) [Abbasi, B. N., 1. Abbasi B. N., Wu Y., Luo Z. (2025)].

Methods

Pedagogy is based on the prognostic features of qualitative parameters aimed at the development of intuition for knowledge. This includes the integrative influence of organizational, methodological, technological, motivational and logical principles in the use of distance learning platforms in the organization of independent learning for students of higher education institutions.

The organization of the Bologna process is a transition in a credit-modular environment, the requirements for the teacher of a higher educational institution are

radically changing today. The requirement of today's period requires the teacher to receive an independent education of students, cognitive activity, intellectual thinking, thinking about new ideas, discovering new ideas, creating scientific innovations, such conditions require him to have independent intellectual creative thinking, creativity, scientific research, independent organizational skills in a higher educational institution. Working in a new credit-modular environment, teachers should explain how the future field individually contributes to the development of professional and personal qualities of specialists, if they focus on the main goal, solve urgent problems taking into account the future specialization of students, create courses using electronic platforms for organizing a full educational process and a cross section of disciplines. Since independent education of students is the most important form of educational process, teachers should direct students' attention to its direct influence on the formation of professional qualities, such as mobility, ability to predict the situation and actively influence it, independence of assessment, etc. [Huang, R. et al. (2024)].

Training teachers to meet the demands of the times is now seen as an important task. For this reason, it is necessary to introduce computer techniques into education in order to improve the quality of education. The UNESCO International Congress on Education and Informatics II (1996) recognized information technology as a strategic resource for education.

The process of informatisation of society affects the vital interests of all members of society. The fact that informatisation is entering the field of education, as it now covers all areas, opens up a wide range of opportunities for students and teachers to learn and teach, and LMS Moodle provides an opportunity for students to become a modern pedagogical cadre for the day of independent education by organising the widespread use of electronic platforms. Therefore, this scientific research is characterised by being very relevant today. The purpose of the study is to qualitatively organise the independent education of students in the educational process using modern distance electronic platforms in the environment of the credit-modular system of education. [Ismatovna, A. Y. (2021)].

This work involves the following tasks:

- Monitoring the history of the emergence of information technology in education;
- Study of the diversity of modern information technologies in education.

The problem of the widespread use of computer technology in education in the last decade is of great interest to local pedagogical science. Russian and foreign scientists have made a significant contribution to solving the problems of computer technology: G. R. Gromov, O. I. Agapova, O. A. Krivosheev, B. Hunter, G. Kleiman and others. [Ismatovna, A. Y. (2022)].

The essence, aims and objectives of informatization of education. One of the priorities of informatization of modern society is the process of informatization of

education. Informatization of education - introduction of means of information and computer technology in the sphere of science, organization and improvement of professional activity of teachers and active management of educational process is one of the important problems of today.

Informatization of the educational process leads to a change in all components of the system of use in order to improve the quality and efficiency of education. In the organization of independent education of students, it is necessary to organize and provide special training of employees of the educational system in the field of creation and use of information technology tools, together with provision of remote electronic software tools, which is one of the pressing issues facing higher education institutions today. [Ismatovna, A. Y. (2021)].

Systematic research into the application of information technology in education has been ongoing for more than 50 years. The education system has always been open to the integration of information technology through the use of a variety of software products. In higher education, various software packages are successfully used, including relatively inexpensive tools such as text and graphics editors, as well as more complex software for working with spreadsheets and creating computer presentations. These tools are often highly specialized and tailored to the needs of different subjects and disciplines.

From observations it became clear that the process of informatization of education means the introduction of information and telecommunication technologies. It is considered the most important direction of informatization of Education, which affects the improvement of the quality of teaching students. However, when studying the informatization of education, it is important to understand that the educational process itself is the basis of a modern higher educational institution or educational institution, but the only field of activity that is currently engaged in the mass introduction of various information technologies.

In the organization of Independent Education of students, the priority direction of training information technologies in education through electronic platforms should be transferred to the correct formation, selection and correct use of electronic software, electronic platforms, educational electronic publications and resources, systematic informatization of education in the teaching of the Integrative aspects of the technical and technological, motivational, liberalistic and logical principles of working with computer.

Result and Discussion

The use of Information Communication Technologies, pedagogical software tools, electronic platform tools in the organization of Independent Education of students always leads to development in all areas of educational activity.

Knowledge is not a goal in itself, but rather a means of personal development. Modern information and communication technologies (ICT) provide the richest opportunities for achieving this. Unlike traditional teaching tools, ICT allows students to not only acquire a large amount of ready-made data, but also to engage in independent educational activities through distance electronic platforms. This results in the development of intellectual and creative abilities, the acquisition of new knowledge, and the ability to work with various sources of information independently. Information technology, considered as one component of an integrated education system, facilitates access to information and reveals the variability and individualization of educational activities. It also allows for the organization of interaction between all educational entities in a new way. [Асадова, Ю. (2021)].

The student will be an active and equal participant in educational activities. The introduction of new modern information technologies, such as the LMS Moodle electronic system and distance learning platforms, into the student's educational process and independent learning activities allows for the qualitative and efficient organization of the educational process. This helps to implement a developing educational system and make the best use of available resources in class, increasing the speed of learning and creating conditions for independent student learning. [Ismatovna, A. Y. (2021)].

Control over the use of a computer leads to an increase in the efficiency of assimilation, the activation of the mental activity of students, the ability to receive independent knowledge, independent creative thinking.

One of the main goals of the computer as a teaching tool is to organize the independent work of students using software and pedagogical tools, the effectiveness of which depends on the level of excellence. [Ismatovna, A. Y. (2022)].

The organization of independent learning using distance learning platforms and the dialogue about the capabilities of computers, organized on the Moodle electronic platform, significantly affects the motivational aspects of the educational process and its structure. The computerization of education has been one of the major innovations that has arrived in the world, including in the educational sector of Uzbekistan, in recent decades. Currently, in the context of the credit-based modular system of education, it has become customary to differentiate between the main areas of computer application by creating e-learning courses using the Moodle platform so that students can engage in independent learning, which is given additional hours as a result of the increase in the amount of independent study time.

To organize independent education of students, teaching of Information Technology in education through the Moodle electronic platform, the Moodle e-learning platform provides a syllabus of Information Technology Science in education mainly with a lecture text on all topics, practical training, laboratory training,

independent educational topics, Assignments, test questions, glossaries, links, video courses and other information [Ismatovna, A. Y. (2021)].

Let's take a closer look at some of the most popular educational programs in the education system.

Today, there are a huge number of modern pedagogical software tools for the qualitative Organization of educational activities, from which each higher educational institution or teacher chooses the one that is convenient for him. it can be used to qualitatively organize training sessions. With the curriculum, the student will be required to provide an opportunity for students to independently use the course by supplementing the course with science programs and syllabus-appropriate all-lecture, practical training, laboratory training, seminar, independent educational topics and assignments, control assignments, test Questions, video courses, links, presentations, books and other information. If a course with such conditions is created from which a student is able to use any electronic device phone apparat, tablet, computer from anywhere at any time of the day, then he will consider this electronic course a good opportunity for the student to receive independent education [Ismatovna, A. Y. (2022)].

The ability to simulate processes and phenomena of interest, as well as to conduct experiments on them, is made possible by computer software tools that are used in areas of human knowledge where real-world experiments would be too time-consuming or even impossible.

The presence of a student knowledge verification system that includes current, intermediate, and final control, as well as compatibility with the examination system, in order to assess the extent to which students have mastered a subject after completing independent educational tasks using the Moodle electronic platform, is important. This system allows for the evaluation of acquired knowledge. Currently, one of the most widely used computerized systems for knowledge control is the testing system for assessing student knowledge on the Moodle platform. The main requirements for such a system include.

Students are assessed by asking test questions, for the purpose of controlling to find out how much the student has mastered in independent learning verification, by asking control questions and tops hit, for example, some calculations, performing logical operations, selecting formulas, some additional actions, such as selecting digital or graphic information, can be given after completion. Tasks given in the form of Test questions are the most common, easy to program and well studied. The development of Test tasks should be compiled from questions of less developed and more difficult levels to implement.

In connection with the transition to the conditions of the Credi-modular system of teaching in higher educational institutions of the Republic of Uzbekistan, students will receive an increase in the number of hours of Independent Education, open educational

programs distance learning platform provides a wide opportunity for independent education of students, while a student with a few amenities will enter the Moodle distance learning platform at any time of The need to create an educational opportunity due to the fact that the freedom to choose the time, place and pace of study is impossible to stop the main activity attracts many people [Ismatovna, A. Y. (2022)].

The idea of continuing education involves the development and improvement of each person throughout their life. The Open Distance Learning Moodle electronic platform implements the idea of Advanced Learning, which is time-consuming. According to experts, technological knowledge becomes obsolete every 2-3 years, and a positive dynamic of this process is observed. It follows from this that in the maintenance of previous educational technologies, at the end of studies in a higher educational institution, the knowledge of the graduate becomes largely outdated. As a result-the need for professional development, that is, the need for an open educational platform, increases.

Open education involves the applicant's free choice of a higher education institution and access to it without a course. Western universities that implement an open education program enter the Russian educational services market and become direct competitors for local education. Today's applicant can successfully study and finish his studies without leaving home, for example, at the leading American virtual University of California, by obtaining a diploma registered in the world market [Ismatovna, A. Y. (2021)].

The concept of distance learning refers to the organization of education in which teachers and students are separated by distance, but still engage in the educational process through specific methods, tools, and forms of interaction. This can be achieved through the use of various technologies such as case technologies, TV technologies, network learning technologies, and the LMS Moodle electronic platform. Case technologies involve the collection and distribution of text-based learning materials to students for self-study. TV technologies utilize broadcast, cable, and satellite television systems to deliver educational content. Network learning technologies allow for real-time communication and collaboration between teachers and students through online platforms. The LMS Moodle is an example of a distance learning management system that provides a virtual learning environment for teachers and students. These technologies enable the creation of a flexible and accessible educational experience that can be tailored to the needs of individual learners. They allow for the sharing of knowledge and resources, as well as the development of critical thinking and problem-solving skills. Distance learning has the potential to transform the way we approach education and provide opportunities for lifelong learning.

LMS Moodle technology of reading through electronic platforms-in this case, full courses are created based on syllabuses corresponding to the syllabus of the subjects

curriculum to which all the information and tasks that the student must master and must complete are given the time of mastering the task is set, until the established deadline, the student must complete the course and Thus, the widespread introduction of Information Technology in education helps to form a unified educational space in which the teacher himself can be included as an educational subject [Ismatovna, A. Y. (2022)].

Information is one of the most valuable resources of society, along with traditional material resources such as oil, gas, minerals, electricity, water, etc., that is, the process of processing it in a way similar to the processes of processing material resources can be perceived as technology.

Unfortunately, often the role of the computer is used only as the capabilities of an unreasonably expensive typewriter. But there are objective reasons for this: not all teachers have enough computer skills. Nevertheless, the computer should be like a whiteboard and Chalk as an integral part of any cabinet. in a number of rooms, modern tools of the screen video projector are needed to replace electronic whiteboards the use of modern Information Technology at different stages of Education allows you to increase the active working time of students during classes to 75-80% instead of the usual 15-20%.

Conclusions

The analysis of the improvement of the methodology of using distance learning platforms in the organization of independent education for students in the field of information technology led to the following conclusions. “Organization of independent education for students of higher education”, “Use of electronic platforms in the organization of independent education”, “Capabilities of electronic platforms”, “Theoretical bases of electronic platforms” and “Capabilities of electronic learning platforms”. Analysis of methods used in the organization of independent education of students

On the basis of the electronic platform LMS the methodical bases of the organization of independent study for students were studied and improved. In the process of self-study, the independent work and intellectual potential of students increased. The didactic possibilities of the teaching methodology based on the dynamic use of digital technologies for the development of independent thinking skills and a culture of creative literacy were given priority.

Data Availability No datasets were generated or analyzed during the current study.

DECLARATIONS

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