Virtual process modeling technologies based on imitation-variability in technical higher education institutions

J.G. Obidov1*

1Fergana Polytechnic Institute, Fergana, Uzbekistan

Abstract. In this article, the scientific significance of modeling technologies of virtual processes on the basis of imitation-variation is revealed, the technology of modeling educational materials through imitation-variation on the basis of technologies for independent education in the educational process of higher technical education, the problems of formation and pedagogical activities of the educational process the development methodology is illustrated on the example of organizing independent education. Keywords: modeling of virtual processes on the basis of imitation-variation, educational technologies, modeling, methodology of technology pedagogical activity development, virtual process, pedagogical skills.

1 Introduction

Imitative-variational pedagogy mainly consists of teaching the analysis of the internal structure of texts in order to train and develop future personnel in the field of technical higher education. The main focus is on understanding technical texts with the help of pedagogical technologies, as well as expanding the possibilities of imitative-variability and visual-practical orientation of educational materials through a synergetic, hermeneutic and praxeological approach. It is aimed at forming in the minds of students the importance of content and technical education of teaching improvement technologies.

Students that learn via virtual reality are entirely immersed in the subject matter. Students' brains produce clear, thorough mental maps of topics when they experience them as real-world situations, which can increase knowledge retention by up to 75%.

Higher education's administrative, teaching, learning, and research processes are being subtly disrupted by AI. Here are a few illustrations: Administrative assistance Artificial intelligence (AI) tools are being used to analyse data on hiring, admission, and retention, to support decision-making, and to rate productivity and performance. AI can assist educators in developing interesting and successful learning experiences that match the needs of all students by offering personalised learning routes, recognising areas of difficulty, and adapting to changing circumstances.

* Corresponding author: jamshidobidov19@gmail.com
Students can receive individualised instruction from AI systems. Each student can study in their own way, according to their comprehension and needs, with personalised instruction. Teachers can create a personalised study plan for each student by first assessing their needs. Depending on how intelligent and capable they are thought to be, agents can be divided into five classes:

- Uncomplicated Reflex Agents.
- Reflex agents based on models.
- Agents with a purpose.
- Agents Based on Utility.
- Learning Assistant.

AI is altering how we access education and learn, and it has the potential to completely change how we approach education in the future. From online tutors to platforms for customised learning.

The information sphere is a constantly expanding area of human activity associated with the production of new information products, services and technologies. Today, the information sphere includes not only research and information centers, networks, libraries and archives, but also office systems, mass media, educational, electoral and information technologies, which generally form the industry of creating, storing, processing and distributing information in all areas of human activity.

A wide and interesting discussion of the problem of transition to active teaching technologies in higher education continues, which allows preparing a future teacher who is able to work in conditions of uncertainty, making a decision on changing existing educational practices. It is known that the traditional education system guarantees the subject training of teachers [1], but does not fully ensure the formation of all the necessary competencies in them. Judging by the study of the experience of pedagogical universities in the analysis of scientific literature and the organization of the educational process, in the preparation of future specialists, first of all, conditions are created for the formation and development of a student as a subject, while professional activity is not taken into account.

### 2 Materials and methods

Today, the rapid development of the innovative sector in the life of society, the growth of the share of intellectual products, information and scientific-technical and innovative activities in the economy has led to the fact that innovations, like minerals, production capacities and intellectual potential, are considered the wealth of the country. Effective use of innovative and scientific and technical potential for the benefit of our country and each of its citizens would not have been possible without the formation of a comprehensive innovation policy in the country and the creation of legislative foundations for its implementation [2].

With the implementation of market reforms, the integration of the country into the world community, the change of the world economic system towards the growth of the role of knowledge and information, the strengthening of relations between new technologies and the capital market, the transition of our country's economy to the path of innovative development becomes of urgent importance.

Teachers spend a significant amount of time grading assignments. AI technologies can facilitate a faster process here. Additionally, AI technology can evaluate essays and assignments and provide students with comments on elements like grammar, substance, and vocabulary.

AI has the potential to transform education. It can be used to modify mastering, provide feedback, carry out task automation, and develop new mastering tales. However, there are
certain difficulties with using AI in education, including cost, prejudice, privacy, and work displacement.

Virtual reality experiential learning enhances a variety of student outcomes. Teachers may raise student learning, achievement, and test scores by up to 20% by providing engaging, personalised experiences like strolling with extinct dinosaurs or experiencing a beating human heart.

Through the creation of engaging, team-based learning settings, virtual reality enhances social and teamwork abilities. In the educational metaverse, students are able to connect and collaborate with one another while safely exploring various learning topics in pairs and groups.

With virtual reality, educators can actually put their students in other people's shoes. Teachers can increase emotional awareness and foster empathy by assisting students in experiencing life from many perspectives, such as by learning about various cultures or living as a refugee.

Virtual reality is advantageous to special education because it expands accessibility and offers new options. Teachers can design individualised learning settings that are in line with students' particular learning contexts and fit their unique needs, from immersive sensory rooms to critical life skills.

Fig. 1. Technologies of organizing independent education

Thus, the updated system of pedagogical education faces the practical task of updating the content and technological components of education based on knowledge about the essence of pedagogical activity [3]. At the same time, it is necessary to focus efforts on modeling the conditions that bring the teacher as close as possible to the real processes of professional activity.

One of the most discussed topics in modern conditions of globalization is the use of the technology of imitation modeling of pedagogical activity, which allows students to work out
practical pedagogical actions in the learning process. Simulation means creating an artificial model of a real process. Thus, in the learning process, it is possible to create behavioral models, separate stages of the pedagogical process, life situations. The educational process based on the technology of imitation modeling includes a complex of educational and self-educational processes aimed at solving the problems of the formation and development of pedagogical activity - explanation (objecting), testing and imitation of the pedagogical process using an artificial system [4].

3 Results and discussion

The simulation technology is based on the construction and solution of increasingly complex pedagogical situations under the guidance of a teacher. The created situation is virtual, and the sessions are dynamic, based on real experience, trying to put the process into practice as much as possible. By its very nature, a virtual process is a conditional environment in which the reader feels more confident and natural than in a real environment. Practice shows that this approach makes it possible to form the pedagogical skills and competencies provided to students, which can then be easily applied in future activities [5]. To implement the process of introducing a student to pedagogical situations, the following are used: algorithmic exercises for mechanical repetition; simulation models - process formation models; situations associated with the solution of increasingly complex pedagogical problems.

The creation of laboratories for simulation models is carried out in several stages. At the first stage, the technical equipment of the laboratory will be carried out. At the second stage, laboratory topics are formed in accordance with the requirements of the state educational standard of higher education and the professional standard approved for the teacher [6]. One of the most important decisions a modeller must make is the choice of this software. If the program is not flexible enough or it is difficult to work with it, then simulation modeling may give incorrect results or even be impossible.

Fig. 2. High and low matrix for inquiry-based learning (IBL) in pedagogy.

Based on the above-mentioned points, it can be concluded that the reflexive and axiological approach determines the complete description of the studied process in terms of content, including the effective planning of technologies for improving the teaching of
educational materials to students on the basis of imitation-variation in the process of independent education, provides organization and diagnosis.

AI's Beneficial Effects on Our Daily Lives. The influence of artificial intelligence is growing in our lives. The majority of our daily actions are influenced by computations or algorithms that are capable of performing tasks better than humans could. It can significantly increase the productivity of our workplaces or factories.

AI can be used in the healthcare industry to evaluate, diagnose, and retrieve vital medical data and information. With the aid of acquired intelligence, AI will be able to prevent several mishaps and threats to data security and privacy in the future. AI uses a variety of programming languages, including Python and Java.

The benefits of implementing artificial intelligence in the educational system are as follows: Individualised instruction based on the requirements of each student. Increased student engagement and motivation.

The experience of the exchange of professional skills with aspects of the quality management system of the creative-modeling learning environment, which ensures the formation of targeted imitative variability in the future quality education or increasing the importance of independent education, serves to clarify the role of the student in the independent education process. A large part of modern professional educational practices, in one way or another, is a dynamic, complex structure related to the provision of imitative-variability and represents a certain risk for the engineer [1], and in the scientific literature, often "engineer-machine" intelligence the so-called environment.

AI can assist educators in developing specialised lesson plans and exams that are in line with each student's particular strengths and limitations by analysing data on student performance and preferences. As a result, students may feel more motivated and have a better overall educational experience.

In conclusion, we can say that almost all traditional methods of interaction between a teacher and a student can be implemented through simulation. The means of simulation models can be technical devices, virtual analogs of personal interaction, as well as some processes. The results of the study showed that, in fact, activities in the context of student involvement in modeling professional activities in a specialized laboratory have a positive effect on the formation of pedagogical skills. The development of a professional orientation in the process of mastering the educational process using a simulation model is an important condition for the formation of readiness for future professional activity, as a result of which the interest of students increases, the necessary skills and abilities are activated, skills and professional qualities are developed.

References

2. T.G. Mukhina, Active and interactive educational technologies (forms of conducting classes) in higher education: textbook. allowance (Nizhny Novgorod: NNGASU, 2013)
7. D. Abdullah, et.al., Caspian J. of Env. Sci. 21, 647-656 (2023)