VIRTUAL REALITY TOOLS AS AN INNOVATIVE SOLUTION TO IMPROVE THE QUALITY OF EDUCATION

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During the years of independence, large-scale work is being carried out in our country to replace the morally and physically obsolete fixed assets inherited from the previous system with the most modern equipment and high technologies, the transition to an innovative economy through the introduction of technological and scientific achievements into the production and science. The adoption of the Action Strategy for five priority areas of development of the Republic of Uzbekistan in 2017-2021, the announcement of 2018 in our country as the Year of Support for Active Entrepreneurship, Innovative Ideas and Technologies was also an important step in this direction. For, "Innovation means the future. If today we begin to build our great future, then we must do this primarily on the basis of innovative ideas, an innovative approach."[48]

The need to introduce innovative technologies into the activities of various sectors of the economy has become increasingly relevant in recent years. This is a reflection of the growing understanding by society that the prosperity of Uzbekistan and the improvement of the economic condition of the country, all spheres of its life is impossible without innovations in production, management, and finance. It is innovations that lead to the renewal of the market, improvement of quality and expansion of the range of goods and services, creation of new methods of production, marketing of products, and improvement of management efficiency. «Sustainable socio-economic progress cannot be imagined without innovative development, broad scientific and technical cooperation and the introduction of new technologies, achievements of science and technology"[49].

The efficiency of the national economy, economic growth, the sustainability of the development of vertically integrated systems, territorial complexes and foreign economic activity are largely determined by the functioning of transport. One of the main modes of transport in our country is railway transport, the efficiency of which, in turn, in modern conditions directly depends on how quickly and smoothly a radical modernization and

[48]Послание Президента Республики Узбекистан Шавката Мирзиёева Олий Мажлису. Тошкент: Ўзбекистон, НМИУ, 2018. б.20.

[49] Киселёв А.М., Шубин И.С., Захаркин В.С. Инновационные технологии на железнодорожном транспорте // Технические и математические науки. Студенческий научный форум: электр. сб. ст. по мат. I междунар. студ. науч.-практ. конф. № 1(1). 2012.

implementation of innovative solutions will be carried out, including in the training of new personnel.

Nowadays, the process of preparing a specialist does not take into account the cognitive styles and preferences of the student, which contradicts the old approach, which considers the student as the subject of the educational process. While the future specialist should become an object to which it is necessary to convey information in the right, competent way and push in the right direction. One of the main problems in teaching railway students is the difficulty of understanding the technical equipment and components of transport mechanisms, the small amount of visual demonstration material, and the lack of practice in the direct process of formation and construction of cars, locomotives and other technical components of railway transport.

For the education system, virtual and augmented reality are promising in terms of using these technologies as innovative learning tools. Today, these are mainly simulators that allow you to study the system and work with it virtually, which in reality, for example, when teaching students how to build locomotives, would be expensive, long, unsafe or impossible for any reason. Such learning tools allow you to gain knowledge and skills regardless of place and time, in comfortable, familiar conditions.

VR (Virtual Reality) tools allow you to expand the boundaries of what is possible for studying theoretical material and working it out in practice. This way of learning is a more modern and practical alternative to traditional methods, which in turn spend too much time and money and do not meet the standards of the new century.

VR makes it possible to explain phenomena and objects that are difficult to understand, thanks to a radical transformation of the principle of visibility. What is demonstrated on the example of the sphere of railway transport. In Japan, trainees of the railway, using a 360-degree panoramic view, which is achieved with the help of virtual reality glasses specially prepared for this purpose, can see in detail the location of the equipment on the electric train. Both the information embedded in the program and these devices create the effect of presence for the user.

The program is able not only to provide detailed information about the mechanisms of the electric train (and not only it), but also to clearly demonstrate each cog, each device with the required degree of detail. This technique is used in the simulation of trains, their movement along the track and many other specific moments of the railway industry, as professional simulators for the training of drivers, which significantly improve the quality of driving and do not require real locomotives and huge financial costs for practice.

3D technologies are of great importance for training personnel in the operation of rolling stock, other railway equipment and devices. For example, with the help of 3D, it is possible to demonstrate to workers step by step the entire process of maintenance, repair and dismantling of units. Some foreign industrial companies are preparing such an

interactive course for their engineers in order to reduce the cost of teachers.According to some estimates, it can increase by 80%[50].

As a result, we kill two birds with one stone - we reduce training costs and get more qualified personnel. Such interactive trainings in 3D are especially useful when studying the features of the flow assembly of equipment of various modifications. Transport safety can also be practiced using 3D. Definitely, this is a better way to explain the procedure than to use boring manuals or give separate lectures to each group of employees.

One of the decisive directions of scientific and technological progress in this industry is the creation of a new generation of technical means. As part of the proposal to introduce virtual reality technical means for training new personnel, it is also proposed to introduce them in terms of modeling new trains, designing details of complex structures (for example, rolling stock) and testing on experimental tracks.

Already at the first stages of development, the use of a 3D solution becomes justified. 3D technologies help to justify investments, whether we are talking about the preparation of completely new products or drawing attention to specific methods of developing railway infrastructure. After all, as a rule, there are only two or three minutes for the presentation of a business idea to prove its viability. With the help of virtual reality systems, this can be done easier and more effectively.

At the next stage - the actual design of the object - virtual reality solutions allow you to quickly detect errors. The traditional scheme or drawing often simply does not allow to identify them at a glance. And with the help of 3D, it will be possible to organize the process of creating a layout in such a way that at the same time we reduce risks and reduce the time for correcting errors.

In addition, the creation of three-dimensional interactive layouts has an economic justification. The virtual model is developed only once, then it is cloned by software for use in subsidiaries or branches of the organization. This does not require additional costs for the creation of another layout, its transportation and storage.

The prospects and pace of implementation of virtual and augmented reality technologies indicate that teaching aids developed on their basis will become an integral part of education at all levels of education. Understanding this, it is proposed to begin with to familiarize the special teaching staff with the technology of working with VR, preparing them for the effective use of this technology for organizing the educational process at all its levels. Determine the following areas of work:

To study virtual reality technologies as a new direction in the information technology industry, the basis for creating virtual reality applications. Introduce pedagogical design of teaching aids based on virtual reality technologies. Determine and conduct an

[50]https://idaten.ru/technology/innovatsionnye-napravleniya-razvitiya-zheleznodorozhnogo-transporta

experimental verification of the organizational and pedagogical conditions for the effective use of such teaching aids in the educational process.

Within the framework of these areas, which, in our opinion, should be implemented at three levels (college, university-bachelor's degree, university-master's), it is proposed to introduce the course "Fundamentals of creating and working in virtual reality applications" to train students to create applications with virtual reality.

The course will be aimed at familiarizing students with virtual reality technologies; development of students' interest and motivation in this direction; training in the application of these technologies in practice; and creating virtual reality applications. Students will apply VR technology; create images (markers) for work; create your own 3D models; develop and use VR applications; own: the skills of using VR application development tools.

Thus, the development of innovative activities, the motivation of innovative processes in railway transport, the introduction of innovations in the work of Uzbekistan Temir Yollari JSC, as well as in the training and training of new young specialists, will increase the competitiveness of railway transport in the transport services market, as well as the efficiency of railway transport.