



## Using innovative technologies to interest students in physics and develop their creativity.

**Abbaz Kunnazarov Bisenbaevich** Nukus is a physics teacher at the Temurbek School military-academic lyceum.  
+99893 920 38 39

**Annotatsiya:** Ushbu maqola innovatsion texnologiyalar yordamida o'quvchilarni fizika faniga qiziqtirish va ularning ijodkorligini rivojlantirish masalalarini o'rganadi. Fizika fani ko'plab nazariy tushunchalarni o'z ichiga olganligi sababli, ko'plab o'quvchilar uni qiyin va zerikarli deb hisoblaydilar. Shu nuqtai nazardan, maqolada virtual haqiqat, kengaytirilgan haqiqat, interaktiv dasturlar va simulyatorlar kabi innovatsion texnologiyalarni qo'llash orqali o'quvchilarning qiziqishini oshirish va ijodiy fikrlash ko'nikmalarini rivojlantirishning samarali usullari ko'rib chiqiladi.

**Kalit so'zlar:** innovatsion yondashuvlar, fizika, ijodkorlik, muammolar, imkoniyatlar, rivojlanish, amaliyot, nazariya.

**Аннотация:** В данной статье исследуются вопросы вовлечения студентов в занятия физикой и развития их творческих способностей с помощью инновационных технологий. Поскольку физика включает в себя множество теоретических понятий, многим студентам она кажется сложной и скучной. В этом контексте в статье рассматриваются эффективные способы повышения интереса учащихся и развития навыков творческого мышления с помощью использования инновационных технологий, таких как виртуальная реальность, дополненная реальность, интерактивные программы и симуляторы.

**Ключевые слова:** инновационные подходы, физика, творчество, проблемы, возможности, развитие, практика, теория.

**Abstract:** This article explores the issues of engaging students in physics and developing their creativity with the help of innovative technologies. Since physics involves a lot of theoretical concepts, many students find it difficult and boring. In this context, the article considers effective ways to increase students' interest and develop creative thinking skills by using innovative technologies such as virtual reality, augmented reality, interactive programs and simulators.

**Key words:** innovative approaches, physics, creativity, problems, opportunities, development, practice, theory.

### INTRODUCTION.

Physics is a branch of science that studies the fundamental laws of nature and the relationships between matter, energy, motion, and forces. Physics, with its extensive and deep theoretical foundations, plays an important role in the scientific and technological progress of mankind. This science is closely related not only to natural sciences, but also to engineering, medicine, astronomy and many other fields. The main goal of physics is to understand natural phenomena and express them using mathematical models. In this process, physicists conduct experiments, develop theories, and search for practical applications. The use of innovative technologies in the modern education system is important in making the learning process of students more effective and interesting. Especially in fields that are complex and contain many theoretical concepts, such as physics, the possibilities of increasing students' interest and developing their creativity will expand with the help of innovative technologies. Physics, with its natural laws and processes, helps students understand their environment, develop problem-solving and analytical thinking skills. However, many students find physics difficult and boring, which reduces their interest in studying. Therefore, it is necessary to make physics more interesting and understandable to students by using innovative technologies. Innovative technologies, such as virtual reality, augmented reality, interactive programs and simulators, allow students to learn the theoretical foundations of physics through practical experiences. With the help of these technologies, students will have the opportunity to see complex physical processes, conduct experiments and apply their knowledge in practice. As a result, students'



interest increases, their creativity develops and they have the opportunity to master their knowledge more deeply. Also, innovative technologies help to develop students' teamwork skills.

### **MATERIALS AND METHODS.**

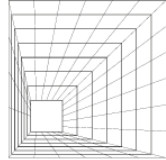
Students develop collaborative skills by working on projects together, solving problems, and sharing ideas. This process, in turn, increases their ability to think creatively and encourages them to develop new ideas. In addition, with the help of innovative technologies, students will have the opportunity to apply their knowledge to solve real-life problems. For example, by applying theoretical concepts in physics, students develop their creative approach and are encouraged to develop new ideas. This process, in turn, increases students' enthusiasm for self-development and strengthening their knowledge. innovative approaches aimed at development are analyzed. Enhancing students' interest in physics and developing their creativity will help strengthen not only their academic success, but also their future careers. Physics, with its complex theories and concepts, can seem difficult and boring to many students. However, with the help of modern innovative technologies, this subject can become an interesting and engaging process for students. Innovative technologies, including virtual reality (VR), augmented reality (AR), interactive programs and simulators, make the educational process more effective and interesting. allows to do. These technologies help students strengthen their knowledge by allowing them to apply theoretical knowledge in practice. With the help of VR technologies, students can conduct physics experiments in a virtual environment. For example, students can conduct experiments in a virtual environment while studying atomic structure or the force of gravity. This increases their interest and makes the learning process more interesting.

With the help of AR technologies, students can see physics concepts in a realistic environment. For example, through AR applications, students can see the laws of physics and learn how they can be applied in real life. It helps to develop students' creative thinking. Interactive programs and simulators allow students to learn the laws of physics in an interconnected way. Students can put their theoretical knowledge into practice by simulating different experiments. This will develop their problem solving skills.[3]

### **RESULTS AND DISCUSSIONS.**

Since the beginning of physics as a science, the database of the science has been increasing in size, and it is getting rich every year at a high speed. For this reason, in the process of passing physics, it is necessary to select only the necessary information and to reduce the amount of information to a quantitative size in accordance with the student's learning abilities. In the educational system, multimedia electronic educational literature, lectures, virtual laboratory works, various animation programs are special programs that are needed for creating slides. In the educational system, the above-mentioned programs have ready-made models, in which the user can widely use several types of work (laboratory, analysis of fire safety issues, animations in presentation lectures) by entering the initial parameters. Examples of programs that enable modeling of physical processes include: MatCad, MatLab, Maple, Crocodile, Physics, Electronics Workbench and other software packages. The use of computer models in educational processes, taking advantage of information technologies, gives its results. Physical knowledge is widely used in information technology for computer modeling of physical processes.[4]

Also, the unique important aspects of modeling are that it is not necessary to prepare various tools, to describe phenomena in a vivid and natural way, to repeat the experience at any time in a short time, to observe processes that are difficult to observe and cannot be observed at all. will also have the opportunity to demonstrate. Computer training is more effective than regular training. Using computer programs in the teaching of physics, conducting animated exercises makes the teacher and the listener comfortable and has a good effect in understanding the mechanisms and stages of physical processes. The mechanisms of physical processes, their demonstration in lectures, practical and especially experimental classes, and conducting these cases based on computer technologies are factors that increase the effectiveness of imparting knowledge to students and creating skills related to the basics of science during the teaching process.[2]



Several strategies can be implemented to engage students in physics through the use of innovative technologies. Giving students the opportunity to conduct hands-on experiments increases their interest. For example, students can conduct their own experiments and analyze the results. This process helps students to strengthen their knowledge. The use of interactive games in the process of learning physics increases the interest of students. Through games, students can learn the laws of physics and apply them in practice. Giving students the opportunity to use innovative technologies to solve real-life problems increases their creativity. [5]

For example, studying issues such as energy conservation or environmental protection will increase students' interest. Giving students access to online resources and platforms will develop their self-directed learning skills. For example, students can learn more about physics through educational videos or interactive courses on YouTube.[6]

The use of modern innovative technologies in the process of teaching physics leads to students' understanding, arouses interest in learning the subject, and improves students' creative abilities. Computer materials are a necessary part of the only educational tools that can supplement, refresh, and become a lifestyle for the teacher. The advantages of integrating innovative technologies compared to traditional education are diverse. To them, in addition to the effective testing of knowledge, production and logical thinking, and testing others, can be related to a variety of methodological forms. Integrating computer technology into the learning process, you can provide. Constructive, algorithmic thinking due to specific features of communication with a computer and specific features of working with specialized programs. Development of creative thinking by changing the content of reproductive activity that performs tasks between intelligent educational systems and modeling programs; Creating communicative skills based on the implementation of joint projects in the process of computer business games.

### **CONCLUSIONS.**

With the help of innovative technologies, it is possible to interest students in physics, make the educational process more effective and interesting. Technologies such as virtual reality, augmented reality, interactive programs and simulators help students apply theoretical knowledge in practice. Engaging students in hands-on experiences, interactive games, and real-life problems will help develop their creative thinking skills. As a result, innovative technologies play an important role in the educational process and help increase students' interest in physics.

### **REFERENCES.**

1. Serway, Raymond A., and Jewett, John W. (2018). *Physics for Scientists and Engineers*. Cengage Learning.
2. Halliday, David, Resnick, Robert, and Walker, Jearl. (2018). *Fundamentals of Physics*. Wiley.
3. Tipler, Paul A., and Mosca, Gene. (2014). *Physics for Scientists and Engineers*. W. H. Freeman.
4. Robotics Education & Competition Foundation. (2023). *Robotics Curriculum*. REC Foundation.
5. Bennett, Arnold, and Nelson, Gary. (2017). *Physics*. McGraw-Hill Education.
6. Young, Hugh D., and Freedman, Roger A. (2019). *University Physics with Modern Physics*. Pearson.