European Science Methodical Journal
ISSN (E): 2938-3641
Volume 2, Issue 12, December- 2024

INNOVATIVE APPROACHES TO TEACHING ANALYTICAL GEOMETRY WITH THE HELP OF MODERN PEDAGOGICAL TECHNOLOGIES

Jamshid Ozodovich Xasanov
Urgench State Pedagogical Institute Acting
Associate Professor of the Department of Physics and Mathematics
jamshid_2425@mail.ru

Sevara Rustamova
Urgench State Pedagogical Institute Master's Student in the
Specialty of Teaching Methods of Exact and Natural Sciences
sevararuslanovna0326@gmail.com

Abstract:

In this article innovative apptoaches to teaching analytical geometry, aimed at the perception and assimilation of students of complex mathematical concepts are considered. Also presented the benefits of using pedagogical technologies such as interactive platforms, blended learning and project methods, including practical recommendations on successful application of modern technologies in the educational process to increase students` interest and participation in this science.

Keywords: Innovative technologies, pedagogical technologies, analytical geometry, interactive learning, visualization in learning, gamification, blended learning, digital platforms, higher education, mathematical education.

Introduction

ZAMONAVIY PEDAGOGIK TEXNOLOGIYALAR YORDAMIDA ANALITIK GEOMETRIYA O'QITISHDA INNOVATSION YONDASHUVLAR

Jamshid Ozodovich Xasanov
Urganch davlat pedagogika instituti
Fizika-matematika kafedrasi v.b. dotsenti
jamshid_2425@mail.ru

Rustamova Sevara Ruslan qizi
Urganch davlat pedagogika institutiAniq va tabiiy fanlarni
o‘qitish metodikasi mutaxassisligi magistranti
sevararuslanovna0326@gmail.com

Annotatsiya:
Ushbu maqolada talabalar tomonidan murakkab matematik tushunchalarni idrok etish va o'zlashtirishga qaratilgan analitik geometriyani o'qitishda innovatsion yondashuvlar muhokama qilingan. Shuningdek interaktiv platformalar, aralash o'qitish va loyiha usullari kabi pedagogik texnologiyalarni qo'llashning avzalliklari, jumladan, talabalarning fanga bo'lgan qiziqish va ishtirokini oshirishda zamonaviy texnologiyalarni ta'lim jarayonida muvaffaqiyatli qo'llash bo'yicha amaliy tavsiyalar berilgan.

Kalit so'zlar: Innovatsion texnologiyalar, pedagogik texnologiyalar, analitik geometriya, interaktiv o'qitish, o'rganishda vizuallashtirish, geymifikatsiya, aralashgan ta'lim, raqamli platformalar, loyihali o'qitish usullari, oliy ta'lim, matematik ta'lim.

Аннотация:
В данной статье рассмотрены инновационные подходы к преподаванию аналитической геометрии, направленные на восприятие и усвоение учащимися сложный математических понятий. Также представлены преимущества применения педагогических технологий, таких как интерактивные платформы, смешанное обучение и методы проектов, включая практические рекомендации по успешному применению современных технологий в образовательном процессе для повышения интереса и участия студентов в этой науке.

Ключевые слова: инновационные технологии, педагогические технологии, аналитическая геометрия, интерактивное обучение, визуализация в обучении, геймификация, смешанное обучение, цифровые платформы, методы проектного обучения, высшее образование, математическое образование.

Introduction

Large-scale reforms are being implemented in the Republic of Uzbekistan to modernize the education system and develop it in line with international experience. In particular, the Resolution of President Shavkat Mirziyoyev dated April 29, 2019 No. PQ-4307 “On measures to develop the education system and further improve the science sector in the Republic of Uzbekistan” and the National Program for the Development of the Education System in 2020-2030 pay special attention to improving the quality of education, introducing modern technologies, and enhancing the scientific potential of young people. These documents are aimed at updating curricula, implementing advanced pedagogical approaches, and organizing the educational process based on innovative technologies. Based on these resolutions, broad opportunities are being created for the use of modern educational methods in general education and higher education institutions. In this regard, innovative approaches to teaching analytical geometry, in particular, the use of technologies, the introduction of interactive and integrated teaching methods, are of great importance. Teaching analytical geometry through modern tools

not only strengthens students' knowledge of the subject, but also develops their logical and analytical thinking skills.

Innovative approaches to teaching analytical geometry, especially the use of technologies and methods that make the learning process more effective and interesting for students. Evidence-based approaches such as gamification, blended learning, and project-based methods [5] help create a learning environment focused on the active participation of students.

Advantages of innovative technologies.

Innovative technologies such as interactive platforms, 3D modeling, gamification elements [5] help increase interest in the learning process. Especially in analytical geometry, there are many complex geometric images that are difficult to imagine with the human mind, but the use of modern tools allows you to visually display such images and makes learning more interesting. When students see real-world applications of analytical geometry concepts, they become more engaged with the subject. It also makes it easier for them to grasp complex concepts. Modern pedagogical technologies help students better understand abstract ideas such as the location of objects in three-dimensional space or the concepts of vectors and planes. Real-time visualization and simulation allow students to observe processes that are difficult to explain in words alone. At the same time, they help develop independent learning and critical thinking skills, and independently solve problems, analyze complex structures, and critically evaluate their solutions.

In addition, digital technologies allow students to communicate and exchange ideas more effectively with each other. For example, interactive whiteboards and online platforms allow the teacher to monitor the progress of tasks in real time, comment on changes during the lesson and suggest improvements. Such interaction speeds up the learning process and allows you to adapt the material to the level of student perception.

Problems and solutions

The above are very good, but there are also some difficulties and limitations: The need for special technical equipment, difficulties in adapting some students, lack of methodological materials on digital tools. Problems with special equipment such as computers, interactive whiteboards, tablets and internet connection to fully use pedagogical technologies. In some educational institutions, especially where funding is limited, it may be difficult to provide the necessary technical base. Also, stable access to the Internet is a prerequisite in a distance format, which can be a barrier for some students. Therefore, an alternative solution needs to be found, as a solution we can call the creation of a special mobile application for studying analytical geometry. Because there are a number of advantages to studying analytical geometry using a mobile application. These advantages are manifested in the following main aspects:

Interactive and Visual Learning Opportunity

It is easier to study the subject visually and interactively through mobile applications. For example, the ability to view graphs in analytical geometry in real time, change shapes, rotate and view them in 3D format helps the student to understand the concepts more clearly.

Facilitates independent learning

The student can study independently using a mobile application anywhere and at any time. This, unlike traditional lessons, helps to create a study schedule that suits each student. There is an opportunity to revise or study a complex topic several times.

Reinforce knowledge through practice and tests

In the mobile application, the student has the opportunity to reinforce each topic through practical exercises and tests. They can improve the learning process by receiving feedback on test results, reviewing results, and understanding their mistakes.

Ease of use

Mobile applications usually have a user-friendly interface for students, allowing them to quickly find the necessary tools and apply them quickly. The user uses the application with ease through an intuitive design and easily finds the necessary information.

Continuous feedback

Mobile applications, in particular, allow students to track their results through automated tests and practices. This helps to assess the student's level of knowledge, identify their successes in a timely manner, and suggest ways to improve them.

Provide excellent understanding with 3D Visualizations

Spatial concepts play an important role in analytical geometry. When 3D graphics and visualizations are available in the mobile application, the student better understands the relationship between shapes by viewing three-dimensional shapes in a three-dimensional way.

Adaptive learning environment

Apps can adapt to the student's level of knowledge and learning goals. For example, simple lessons and basic concepts are offered for beginners, while more complex tasks and more practical exercises are offered for advanced users.

Digital support beyond traditional lessons

Mobile apps allow students to learn independently through digital resources in addition to books and other traditional sources. At the same time, it is also a means of providing additional support to teachers, as they can provide additional lessons or practical exercises using the app.

Increases motivation

Mobile apps make the learning process interesting and interactive, which increases student motivation. When gamification elements are added, such as points, rewards, levels, or incentive elements, the student's interest in learning increases and he strives to further improve his knowledge.

Conclusion

Creating a mobile application for teaching analytical geometry is of great importance in the modern education system. Through this application, students will learn the subject more effectively and interestingly, and teachers will have the opportunity to manage the educational process more effectively. An integrated approach is required to introduce the application in educational institutions. This requires special training of teachers, preparation of technical infrastructure, and development of clear instructions for using the application. It is also important to regularly evaluate the effectiveness of the application and make necessary changes. Such applications can be widely used not only in teaching analytical geometry, but also in teaching other specific subjects. This will help improve the quality of general education and effectively use modern technologies. In the future, such applications may become an integral part of a unified education system.

REFERENCES

1. Decree of the President of the Republic of Uzbekistan dated October 7, 2016 "On measures to improve the quality and accessibility of higher education in the Republic of Uzbekistan".
2. Resolution of the President of Uzbekistan dated October 22, 2019 "On additional measures for the development of science and education in the Republic of Uzbekistan".
3. Decree of the President dated January 14, 2021 "On the Development Strategy of the Republic of Uzbekistan for 2021-2025".
4. "Analytical Geometry". N. I. Lobachevsky Description: A classic work that laid the foundations of analytical geometry.
5. Геймификация. Теория и практика в образовании — авторы: Л. В.Гущина, В. Ю. Борисов "Геймификация в образовании: теория и практика" 2019y.
6. Кнут, Д. “Искусство программирования”. 3-tom — Moskva:Мир, 1974-1975yy.
7. "Analitik geometriya" (M. I. Snegirev). Tavsif: Analitik geometriyaning asosiy mavzulari va texnikasini qamrab olgan darslik.
8. Л. В. Гущина, В. Ю. Борисов "Геймификация в образовании: теория и практика" 2019y.
9. V. P. Bespalkoning "Pedagogika asoslari" Tavsif: pedagogik nazariya va amaliyotning asosiy jihatlarini o'z ichiga olgan darslik.
10. "O'qitish usullari" N. I. Rozov Tavsif: Turli fanlarni o'qitishning uslub va texnikasi tahlili