

Ilm-fan va
texnologiyalar

Наука и
технологии

Science and
technologies

2024
№ 1 / 1



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Kasimov Feruz Fayzulloevich

Texnik muharrir:

Hazratov Fazliddin Xikmatovich

Tahririyat manzili:

Buxoro shahar, Q.Murtazoyev ko'chasi, 1/2 uy

Email: admin@sciencetech.uz

Jurnalning elektron manzili:

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Adizov Baxtiyor Raxmonovich, pedagogika fanlari doktori, professor.
Ajiyeva Muhabbat Baxtibayevna, pedagogika fanlari nomzodi, dotsent.
Alimov A'zam Anvarovich, pedagogika fanlari bo'yicha falsafa doktori (PhD), dotsent.
Bozorova Saodat Djamolovna, pedagogika fanlari doktori, professor.
Ergasheva Gulruxsor Surxonidinovna, pedagogika fanlari doktori, professor.
Jo'rayev Akmal Razzoqovich, pedagogika fanlari bo'yicha falsafa doktori (PhD), professor.
Kurbaniyazova Zamira Kalbayevna, pedagogika fanlari doktori, dotsent.
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Xazratov Fazliddin Xikmatovich, pedagogika fanlari bo'yicha falsafa doktori (PhD).

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Jo'rayev Turob Doniyorovich, texnika fanlari nomzodi, professor.
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Raxmatov Ilhom Ismatovich, texnika fanlari nomzodi, professor.

Murtazoyev Azizbek Nusrat o'gli, texnika fanlari bo'yicha falsafa doktori (PhD), dotsent.

Eshonqulov Hamza Ilxomovich, texnika fanlari bo'yicha falsafa doktori (PhD), dotsent.

Shafiyev Tursun Rustamovich, texnika fanlari bo'yicha falsafa doktori (PhD), dotsent.

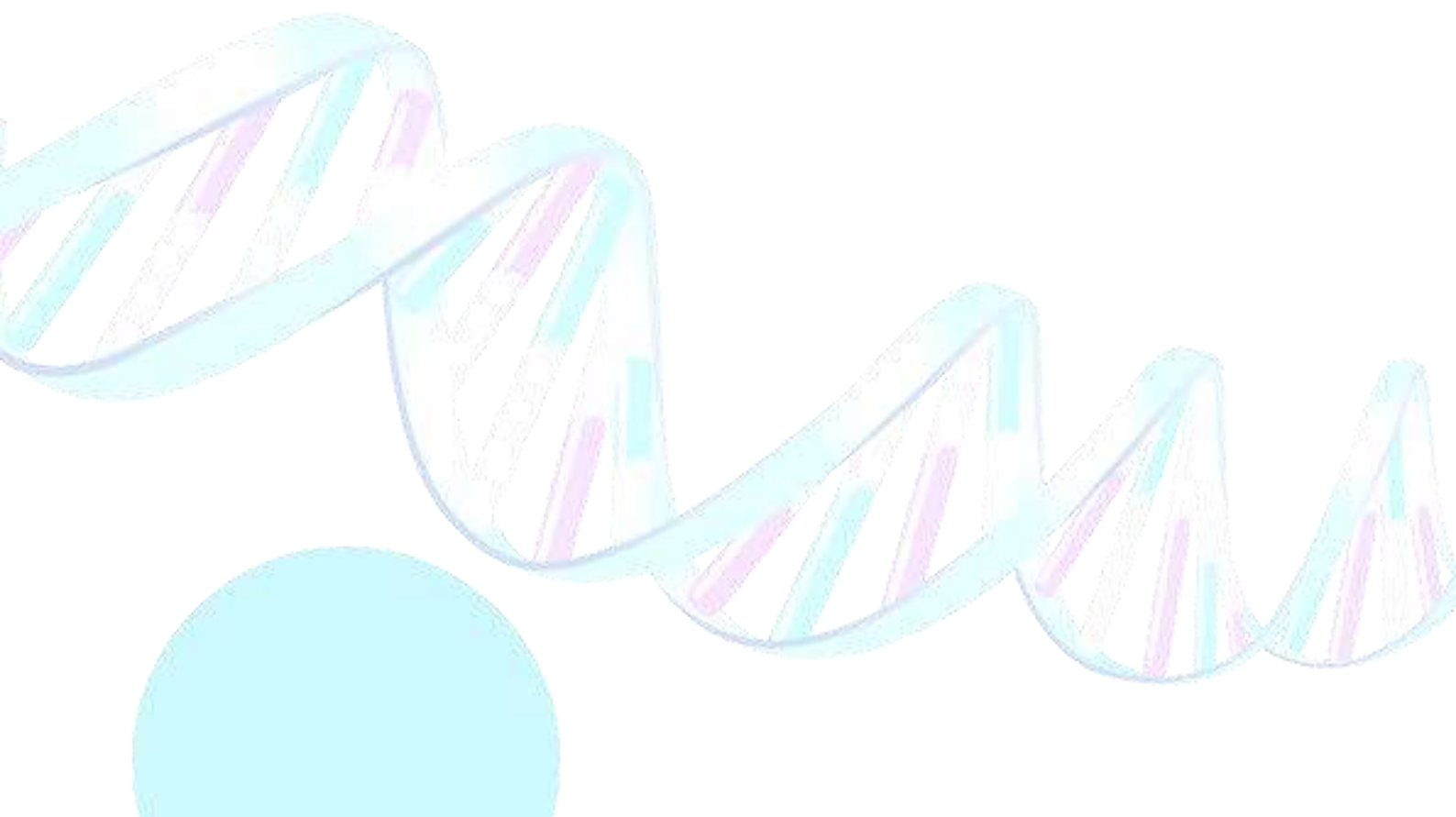
Bakayev Ilxom Izatovich, texnika fanlari bo'yicha falsafa doktori (PhD), dotsent.

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Inoyatov Sulaymon Inoyatovich, tarix fanlari doktori, professor.

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SCIENTIFIC AND METHODOLOGICAL ANALYSIS OF INNOVATIVE APPROACHES AND NEW TRENDS IN MODERN EDUCATION.

Sadullayev Ibrat Shuxratovich,

Doctoral student of Bukhara State University

Tel: +998939669566 **email:** ibratsadullayev@gmail.com

<https://orcid.org/0000-0001-5425-8566>

Abstract: This article explores new trends and innovative approaches in modern education, providing information on their implementation in the educational process. In the rapidly evolving landscape of modern education, innovative approaches and emerging trends are transforming traditional pedagogical paradigms. This paper presents a scientific and methodical analysis of these innovative methods, exploring their efficacy, application, and impact on educational outcomes. The study systematically reviews contemporary educational strategies such as flipped classrooms, gamification, project-based learning, e-learning, and personalized learning. Additionally, it includes a comparative analysis of traditional and innovative educational approaches.

Keywords: traditional teaching, project-based education, virtual reality, blended learning, jigsaw method, crossover teaching, personalized learning.

Аннотация: В данной статье исследуются новые тенденции и инновационные подходы в современном образовании, предоставляется информация об их внедрении в образовательный процесс. В быстро меняющемся ландшафте современного образования инновационные подходы и новые тенденции трансформируют традиционные педагогические парадигмы. В данной статье представлен научный и методический анализ этих инновационных методов, изучение их эффективности, применения и влияния на результаты обучения. В исследовании систематически рассматриваются современные образовательные стратегии, такие как перевернутые классы, геймификация, проектное обучение, электронное обучение и персонализированное обучение. Кроме того, он включает сравнительный анализ традиционных и инновационных образовательных подходов.

Ключевые слова: традиционное обучение, проектное обучение, виртуальная реальность, смешанное обучение, метод «головаломка», перекрестное обучение, персонализированное обучение.

Introduction. In the traditional education system, it is not uncommon to encounter students who are merely physically present in the classroom, showing signs of disengagement and lack of interest in the teaching and learning process. This passive participation often results in students merely listening to the teacher's voice echoing in what they perceive as a dull and uninspiring classroom environment. However, there is a growing awareness among educators that this approach is ineffective and that a

shift towards more innovative and engaging teaching methods is necessary. This realization has sparked a movement towards adopting different instructional approaches that can captivate students' interest and actively involve them in the learning process. Consequently, modern educators are embracing new trends and innovative strategies to create a more dynamic and interactive classroom experience. It has become increasingly clear that the education landscape is evolving at a rapid pace, and teachers must be willing to adapt to these changes in order to effectively engage and educate their students. Failure to do so may result in a disconnect between educators and students, hindering the learning experience.

Innovative teaching methods are not only about using the latest technology in the classroom or staying up to date with the latest trends in education, but also about a unique way of teaching and learning. Almost all of them allow for new teaching strategies that are more student-centered. These innovative approaches serve to ensure students' active participation in the lesson process, encouraging them to interact with their peers and the teacher during the lesson. Students need to work harder on themselves, but it is important that this is based on an educational experience that better meets their needs and helps them grow faster.

Teaching practices have gained popularity globally as traditional classrooms shift to online and hybrid learning. However, prolonged screen time can lead students to lose focus and become easily distracted. It's important not to solely blame students for lack of engagement, as teachers also bear the responsibility of ensuring lessons are engaging and high-quality. Many educational institutions, teachers, and trainers are exploring new and innovative teaching methods to maintain student involvement. Digital technologies play a vital role in capturing students' attention and enriching the learning process.

Trends can be considered as changes within a system that potentially impact the functioning of the system (education system). These could include new teaching methods, changes in research and curriculum development, attitudes/behaviours of staff and students in the school system etc. Educational trends could be threats, challenges, opportunities, innovations or initiatives that bring social, economic, political and cultural developments to society. Educational trends could be related to the emergence of technology that could be related to the growth and development of education. However, contemporary trends in educational developments are bringing about changes and necessary conditions for innovation in teaching, learning, management, research and community services across the world.

Modern trends in educational technology and development include social learning, analytical learning design, flipped instruction, dynamic assessment, and event-based learning. The changing global economic scenario and advancements in modern technology have given rise to many new trends in education for greater global

competitiveness. These modern trends in education are all about innovation, accessibility, and aptitude that can bring about a positive change in the world. This means students are encouraged to learn using interactive, hands-on knowledge-building and productivity-enhancing tools that can help them become more globally competitive. These modern trends enable both teachers and students to gain practical knowledge for their personal and professional growth. Meanwhile,

Educational development is a systematic process of improving administrative and teaching activities in education with the aim of organizational and individual growth. Educational development is a way of improving teaching and learning to promote the growth of individuals and society through innovative and creative minds. Educational developers usually work closely with learning technologists to use technological devices in teaching and learning and develop electronic resources to support staff and students in academic institutions across the world.

Methods. Advantages of innovative teaching methods: Encourage research – Innovative pedagogical approaches foster an environment where students are motivated to explore and uncover new tools, thereby broadening their intellectual horizons;

Improve problem-solving and critical thinking skills – Utilizing creative teaching methods allows students to learn at their individual pace and fosters the exploration of innovative problem-solving strategies, rather than solely relying on prescribed answers from textbooks;

Avoid receiving a lot of knowledge at once – Educators employing novel methodologies continue to impart knowledge to their students, albeit in a manner characterized by its segmentation into smaller units. This deliberate approach fosters enhanced comprehension and expedites the assimilation of foundational principles;

Improve self-evaluation – Through effective teaching methods, students can comprehend the material and discern areas of further learning. This insight serves to cultivate their enthusiasm for acquiring knowledge;

Enliven classrooms – To avoid a classroom environment dominated by monologue or uncomfortable silence, it is essential to embrace innovative teaching methods. These methods offer students a compelling reason to actively participate, fostering increased engagement and interaction.

Innovative methods of education.

Interactive lessons. Interactive lessons are key for engaging students in the learning process. Traditional one-sided lessons can be tiring for both students and teachers, so it's important to create an environment that encourages students to participate and express themselves. There are many ways for students to get involved in classroom activities beyond simply raising their hands or giving verbal responses. Nowadays, there are numerous online platforms available that facilitate interactive

classroom activities, saving time and increasing student engagement. For instance, live quizzes with spinner wheels, games, polls, and group brainstorming sessions can be conducted to involve the whole class. These online platforms make it possible to engage all students, and they also allow students to respond anonymously, which can boost their confidence and encourage them to share their opinions without the fear of being judged for giving a “wrong” answer.

Using virtual reality technology. Utilizing virtual reality (VR) technology, students have the opportunity to immerse themselves in an entirely new educational environment within the confines of the classroom. Through the utilization of a 3D movie theater or engaging in VR games, students can interact with three-dimensional objects, thereby transcending the limitations of traditional flat-screen presentations. This innovative approach enables students to swiftly transport themselves to distant countries, embark on celestial voyages to explore the Milky Way, or delve into the prehistoric era, all while encountering life-sized dinosaurs mere meters away.

Blended learning. Blended learning is a technique that combines traditional classroom teaching and high-tech online teaching. It provides teachers and students with more opportunities to create an effective learning environment and adapt their learning experience. In a technology-driven world where we live, it is difficult to ignore powerful tools such as the Internet or electronic education programs. Video meetings for teachers and students, LMS for course management, interaction and many educational applications serving educational purposes have taken over the world.



Figure 1. An introduction to Project Based Learning.

Project-based learning. In this approach, all students work on projects. Project-based education revolves mainly around projects and allows students to solve real problems and find new solutions for a certain period of time. PBL makes classes more engaging, students learn new content and develop skills such as research, independent and collaborating with others, thinking critically, etc. In this active learning method, the teacher acts as the guide and the students take up learning tours. The learning

process in this way leads to good engagement and understanding, activates their creativity and promotes lifelong learning. Project Based Learning (PBL) is poorly defined and often a misunderstood approach to teaching and learning. It sits at the centre of a Venn diagram of pedagogy, practice, learning theories, technology and specialist subject knowledge that to many makes adopting PBL difficult. PBL is a powerful tool that whilst being more resource intensive than traditional didactic approaches, has the potential to teach learners how to be resilient, tech savvy problem solvers that are used to working collaboratively with gracious professionalism.¹

Inquiry-based learning. Inquiry-based learning is also a type of active learning. Instead of reading lectures, the teacher begins the lesson by presenting questions, problems, or scenarios. It also includes problematic education and does not rely much on the teacher; in this case, a teacher is more likely to be a facilitator, not a speaker. Students need to research a topic independently or with a team to find an answer. This method helps them solve the problem and develop research skills.

Jigsaw. Jigsaw is a simple game method. If the teacher wants to use Jigsaw's technique in the classroom, students must first be divided into small groups and each group must be given one of the plans (subcategory) of the main topic. Then there will be instructions on how to study the given ones and develop their own ideas. Each group shares its own conclusions, creating a large image (understanding) consisting of all knowledge on the subject they need to know. The next step will be appropriate if an opinion session is held for students to evaluate and comment on the work of other groups. Thus, each subject can be assigned to a separate group of students and allowed to work separately on them before teaching their partners the information they find.

Flipped classroom. Before training, students need to watch videos, read materials, or do research to gain some basic insights and knowledge. Class time is devoted to performing what is commonly referred to as "homework" performed after class, as well as group discussions, debates or other activities run by students. This strategy is student-oriented and can help teachers to better plan personalized learning and evaluate student performance.

Peer Teaching. It is also similar to the jigsaw technique approach. Students will understand and absorb knowledge better if they can clearly explain it. When presenting, they can learn from the forefront and speak out loud what they remember, but to teach their peers, they need to understand the problem thoroughly. Students can take the lead in this activity by selecting their field of interest within the field of science. Giving such autonomy to students will help them develop a sense of ownership of the subject and the responsibility of properly teaching it. It is also possible to increase their self-

¹ <https://community.arm.com/education-hub/b/rob-leeman/posts/introduction-to-project-based-learning>

confidence, encourage independent learning and improve presentation skills by giving students the opportunity to teach their classmates.

Crossover teaching. It is no secret how much excitement and pleasure it will be for everyone to go to a museum, exhibition or tour during school. Going out and engaging in a workshop that is different from looking at a file in a classroom has always been effective. Crossover teaching in turn combines learning experience both in and out of the classroom. Visiting a certain place where you can study the concepts at school together and then see how this concept works in a real environment is a key prerequisite for this method. At the same time, it is more effective to further develop the lesson by holding discussions in the classroom after the trip or by determining group work. Virtual crossover teaching can also be used freely. Sometimes, it is not always possible to go outside, in the same cases you can organize a virtual tour of various art museums, tourist facilities and geographical destinations.

Personalized learning. In this case, while the education strategy works for some students, for another group it may not be so effective. For example, group activities are great for extroverts, but extreme introverts can be an inconvenient educational environment for students. This method adapts each student's learning process. The main thing is planning. Learning by allowing more time to prepare will help students achieve better results based on their interests, needs, strengths and weaknesses. Each student's learning potential may vary, but the ultimate goal remains the same; This approach was considered a key factor in providing the student with the knowledge that would arm him for the future.

Innovative Methods of Education.

Table 1.

Method	Description	Benefits
Flipped Classroom	<i>Students review lecture materials at home and do practical work in class.</i>	<i>Enhanced engagement and better use of classroom time.</i>
Gamification	<i>Incorporating game elements in learning to make education more engaging.</i>	<i>Increased motivation and participation.</i>

Project-Based Learning	<i>Students learn by actively engaging in real-world and personally meaningful projects.</i>	<i>Development of critical thinking and problem-solving skills.</i>
E-Learning	<i>Using electronic media and technologies for education.</i>	<i>Flexible learning schedules and accessibility.</i>

Result and Discussion. Innovative teaching pedagogy entails modern and creative approaches to learning and teaching that go beyond traditional methods. For example:

- **Project-based teaching:** Students gain knowledge and skills by studying for a long time to investigate and answer an interesting and complex question, problem or problem.
- **Problem-based education:** similar to project-based education, but it's mainly focused on some of the students' choices and a complex problem that allows them to own the learning process.
- **Inquiry-based education:** Students learn by questioning assumptions and asking questions to verify. The teacher will help rather than teach directly.

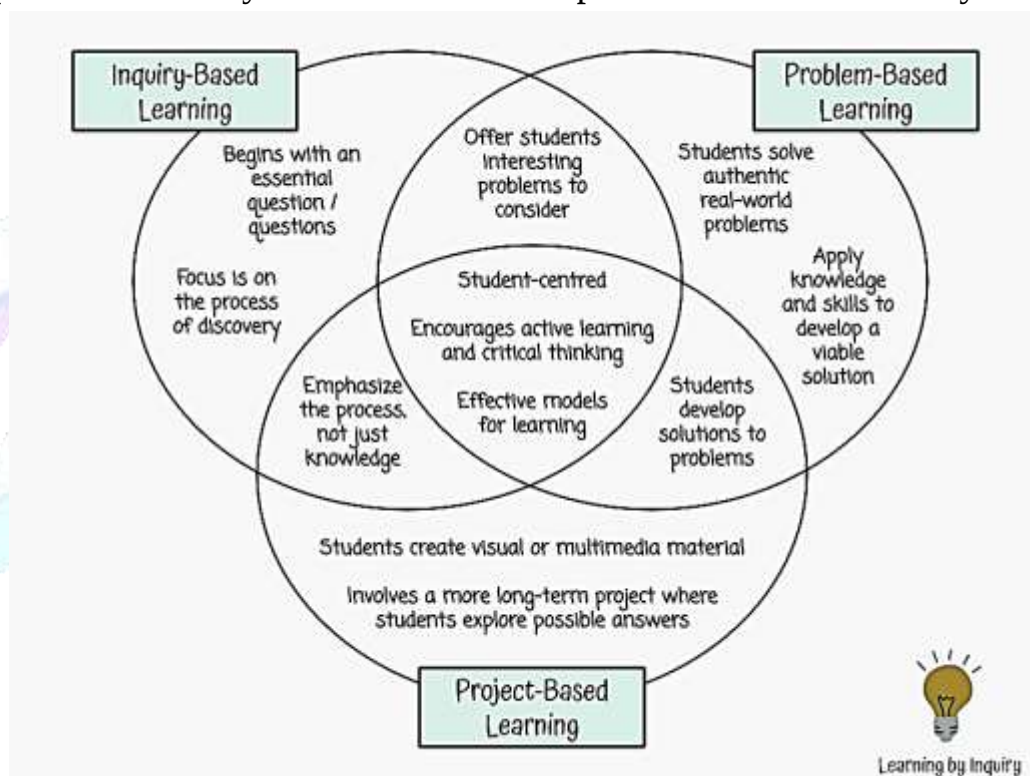


Figure 2. Venn diagram illustrating the differences between the 3 methods.²

² <https://www.learningbyinquiry.com/what-the-heck-is-the-difference-between-ibl-and-pbl/>

Here are a few examples of innovation in the educational process: a high school science teacher tried to help students better understand complex cell biology concepts, so he created an immersive simulation using virtual reality technology; Students were able to “shrink” using VR garrisons to study the 3D interactive model of the cell. They could observe their structure and functions closely by floating around various organelles, such as mitochondria, chloroplasts and nuclei; Students can conduct virtual experiments, such as observing molecules moving through membranes through diffusion or active transport. They recorded their scientific drawings and evidence of their research in the process.

Jigsaw activities in the subject of Ecology - give the class such an understanding as “weather.” Groups need to find a set of qualities, a combination to describe the good-for-bad weather or how the weather improves, and sentences written about the weather from a special source (books) to talk about seasons;

Jigsaw activity in the subject of Biography - In a particular area, a public figure or fictional hero is selected and readers are asked to find out more about him. For example, they can research the basics of Isaac Newton, the milestones (including the famous apple event) and legacy of his childhood and mid-years.

Jigsaw activity in the subject of History - Students read texts about a historical event, or Second World War, and gather information to understand more about it. Small themes can be prominent Jewish figures, key fighters, reasons, timesheets, pre-war events or declarations of war, the progress of war, etc..

Conclusion. In recent years, a paradigm shift has taken place in the field of education, with innovative approaches becoming increasingly important. These approaches include using technology in the classroom, implementing project-based learning, facilitating collaborative and interactive learning environments, personalized learning, and incorporating real-world applications into the curriculum. These innovative approaches are critical to preparing students for the challenges of the 21st century and ensuring their success in an increasingly digital and connected world. In conclusion, the above innovative approaches have become an integral part of the modern education system. Promoting these innovative approaches and integrating new trends into the teaching process is one of the most important tasks facing pedagogical scientists.

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