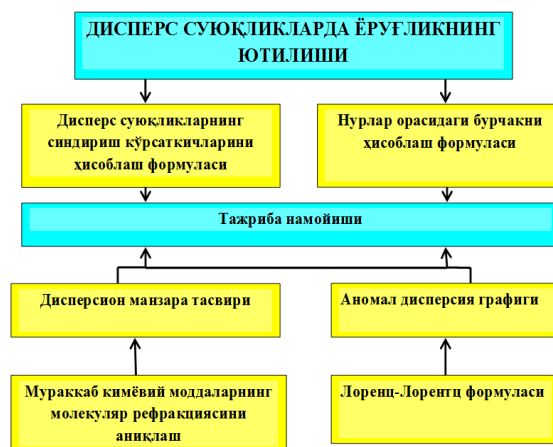


Бундай эксперимент, одатда, лаборатория эксперименти дейилади, ҳамда назарий ҳисоб-китоблар орасида «кўприк» бўлиб хизмат қилади. Хусусан, идеаллаштирилган моделининг компьютерли моделидан фойдаланган ҳолда, аниқ натижалар олишимиз мумкин. Ваҳоланки, бундай мавҳум модели лаборатория шароитида умуман яратиб бўлмайди. Шу билан бирга, реал модель асосида олиб борилган компьютерли эксперимент натижаларини бевосита лаборатория эксперименти натижалари билан таққослаш мумкин. Шунини таъкидлаб ўтиш мумкинки, компьютерли моделлаштириш фикрлаш жараёнининг ўрнини босмайди, балки лаборатория эксперименти каби мураккаб ҳодисаларнинг моҳиятини очиб беришда қурол сифатида ишлатилади. Таълим тизимида тайёр ишлаб чиқилган мультимедиа электрон ўқув қўлланмалар мавжуд. Физик жараёнларни моделлаштириш имкониятини берадиган дастурларга: MatCad, MatLab, Maple, Matematika системалари, CrocodilePhysics, ElectronicsWorkbench, InteractivePhysics ва бошқа дастурий пакетларни мисол келтириш мумкин [5:204].

Физика таълими жараёнида оптика лаборатория машғулотларининг объектларини табиий усулда кузатиш имкониятининг чегараланганлигини кўп вақтни талаб қилиши машғулотларда дастурий воситалар ёрдамида моделлаштирилган усулни қўллаш заруриятини белгилайди. Шу мақсадда, **“Ёруғликнинг ютилиши”** деб номланган моделлаштирилган ишланма лаборатория ишининг қўшимча топшириғи сифатида мажмуага киритилди ва амалиётга жорий қилинди. Замонавий фан ютуқларидан фойдаланиб ўқув методик ва дастурий фондни кучайтириш мақсадида ишлаб чиқилган ушбу ишланма талабаларнинг илмий техник тафаккурини оширади, креатив компетентлигини оширади. Ушбу электрон ишланманинг таркибий тузилишининг блок схемаси 2-расмда тасвирланган:



2-расм. Ёруғликнинг ютилиши мавзусидаги моделлаштирилган ишланманинг блок схемаси

Техника олий таълимида физика таълимида ҳар бир дарс ўз ичига:

мутахассиснинг ўқув режасида мавжуд бўлган бошқа фанлар билан ўзаро алоқасини; ўрганилган билимларни фан-техникада қўллаш ва бўлажак мутахассислик билан боғлиқлигини; яқка тартибда ва мустақил ишлаш учун кенг имкониятларни олиши керак.

Талаба физик жараёнларни моделлаштириш асосида ўрганиш билан билан бирга унинг мураккаб изланиш, таҳлил қилиш ва эркин фикр юритиш, қарор қабул қилиш қобилиятлари ривожланади, шунингдек, ўқитувчининг таълим методлари ва шакллари танлаш имкониятлари кенгайди;

Талабаларда техник тафаккурни ошириш ва шакллантиришда физик жараёнларни моделлаштиришга асосланиб ўқитишда ахборот технологияларидан фойдаланиш таълимнинг янада самарадорлигини ошишига сабаб бўлади.

Адабиётлар

1. Ўзбекистон Республикаси Президентининг 2021 йил 19 мартдаги “Физика соҳасидаги таълим сифатини ошириш ва илмий тадқиқотларни ривожлантириш чора-тадбирлари тўғрисида” ПҚ 50-32-сонли Қарори.
2. Зайнитдинова М.А. Маҳорат мактабларида ўқитувчиларда табиий ва аниқ фанлар бўйича компетенцияларини шакллантириш масалалари. Замонавий таълим. 2016. №1. 43-45-б.
3. Наумкин Н.И. Подготовка студентов национальных исследовательских университетов к инновационной инженерной деятельности на основе интеграции теоретического и практического обучения этой деятельности: Автореф. дис. канд. пед. наук.
4. Рузиева Д.С. Применение методы интеграции природных и виртуальных сред связанные с изучением законов света//«Математика, физика ва ахборот технологияларининг долзарб муаммолари» мавзусидаги Республика миқёсидаги онлайн илмий-амалий анжумани. –Бухоро: 2020, 261-264-б.
5. Роберт И.В. Теория и методика информатизации образования (психолого-педагогический и технологический аспекты). 2-е издание, дополненное. – М: ИИО РАО, 2008. –С. 274.

РЕЗЮМЕ. Мақолада физика фани мисолида техника йўналишидаги олий таълим муассасалари талабаларининг политехник тафаккурини дастурий моделлаштириш методи орқали ривожлантириш имкониятлари келтирилган.

РЕЗЮМЕ. В статье представлены возможности развития политехнического мышления студентов высших учебных заведений в области технологий на примере физики с помощью метода программного моделирования.

SUMMARY. The article presents the possibilities of developing the polytechnic thinking of students of higher educational institutions in the field of technology on the example of physics using the method of software modeling.

THE ROLE OF ARTIFICIAL INTELLIGENCE IN PERSONALIZED LEARNING AND ITS IMPACT ON STUDENT ACHIEVEMENT

L.J.Saxanova – assistant teacher

Nukus state pedagogical institute named after Ajiniyaz

N.K.Allamuratova – master student

Nukus branch of Tashkent university of information technologies

L.O.Raxmetova – teacher

Nukus school № 4

Tayanch soʻzlar: sunʼiy intellekt, oʻqitish, moslashtirilgan oʻqitish, maʼlumotlar tahlili.

Ключевые слова: искусственный интеллект, обучение, персонализированное обучение, машинное обучение, анализ данных.

Key words: artificial intelligence, learning, personalized learning, machine learning, data analytics.

Personalized learning is a teaching approach that tailors instruction to meet individual student's needs, abilities, interests, and learning styles. It seeks to enhance student learning by providing them with customized instruction, feedback, and assessment that are adapted to their unique

learning preferences. With the advancement of technology, Artificial Intelligence is becoming an essential tool in personalized learning, enabling teachers to create adaptive learning environments that respond to each student's individual needs. This essay aims to examine the role of arti-

cial intelligence in personalized learning and its impact on student achievement.

Personalized learning is a student-centered approach that puts students at the center of the learning process. It recognizes that each student is unique and has different learning preferences, interests, and abilities. Personalized learning aims to enhance student learning by providing them with tailored instruction, feedback, and assessment. In a personalized learning environment, students are actively involved in setting their learning goals, monitoring their progress, and reflecting on their learning outcomes [1:23].

Artificial intelligence can be used to create personalized learning experiences by analyzing data on individual student performance and providing customized recommendations and resources based on their strengths and weaknesses. Artificial intelligence can help teachers to identify where students are struggling and provide targeted interventions to support their learning.

Some ways Artificial intelligence can be used in personalized learning include:

- Adaptive learning: Artificial intelligence algorithms can analyze a student's performance on quizzes and assignments to identify areas of strength and weakness, and adjust the difficulty level and content of subsequent activities accordingly.

- Intelligent tutoring systems: Artificial intelligence can provide one-on-one tutoring for students, using natural language processing to respond to their questions and offer guidance in real-time.

- Learning analytics: Artificial intelligence can analyze data on student performance across a range of activities and provide insights to teachers on areas of improvement and individual student needs.

- Personalized content creation: Artificial intelligence can create customized learning materials for students based on their interests and learning style.

The use of Artificial intelligence in personalized learning can offer several benefits to students, including:

- Increased engagement: By providing learning experiences tailored to their individual needs, students may be more motivated and engaged in the learning process.

- Improved learning outcomes: Personalized learning can help students to master content more effectively and efficiently by focusing on areas where they need the most support.

- Flexibility: Personalized learning can be adapted to meet the needs of individual students, allowing them to work at their own pace and focus on topics of interest to them.

Overall, Artificial intelligence has the potential to revolutionize the way we approach education by enabling personalized learning experiences that can better meet the needs of individual students [2:15].

Some key features of personalized learning include:

- Individualization: Personalized learning takes into account the individual needs and learning styles of each student, and provides customized learning experiences that are tailored to their strengths, weaknesses, and interests.

- Flexibility: Personalized learning allows students to work at their own pace, giving them the flexibility to take more time on topics that are challenging or move more quickly through material they have already mastered.

- Technology integration: Personalized learning often involves the use of technology to support and enhance learning, such as adaptive software, online resources, and learning management systems.

- Student choice and voice: Personalized learning empowers students to take ownership of their learning by allowing them to choose topics of interest, collaborate with peers, and provide feedback on their learning experiences.

- Competency-based progression: Personalized learning often focuses on developing students' competencies or

skills, rather than simply mastering content. This allows students to demonstrate their understanding in a variety of ways and move at their own pace towards mastery.

Overall, personalized learning offers a student-centered approach to education that emphasizes individualization, flexibility, and student empowerment. It has the potential to better engage students, improve learning outcomes, and prepare them for success in a rapidly changing world.

Previous studies on the use of Artificial intelligence in personalized learning have generally found positive impacts on student achievement. Here are a few examples of studies and their findings:

- A study by the RAND Corporation found that students who used an adaptive learning system that used Artificial intelligence to personalize their learning achieved significantly higher scores on math assessments than those who did not use the system.

- Another study by the University of Michigan found that an Artificial intelligence-powered virtual tutor improved student performance on math word problems, with students who used the tutor achieving significantly higher scores than those who did not.

- A study by the American Institutes for Research found that an Artificial intelligence-powered reading comprehension program improved reading outcomes for struggling readers in grades 4-8.

- A review of 13 studies on Artificial intelligence in education by the Clayton Christensen Institute found that Artificial intelligence-powered adaptive learning systems had a positive impact on student achievement in math and reading, and that these impacts were generally larger for low-achieving students.

However, it is important to note that there are some limitations to the existing research on Artificial intelligence in personalized learning. Many studies have been small-scale and focused on specific subjects or age groups, and more research is needed to fully understand the potential impact of Artificial intelligence on student achievement in a variety of contexts.

Additionally, there are concerns about the potential for Artificial intelligence to reinforce biases or perpetuate inequities in education. It is important to carefully consider the ethical implications of using Artificial intelligence in personalized learning and ensure that it is implemented in a way that promotes equity and accessibility for all students.

Artificial intelligence in personalized learning has several strengths and limitations that should be critically analyzed to determine its efficacy and ethical implications. Here are some key strengths and limitations of Artificial intelligence in personalized learning:

Strengths:

- Personalization: Artificial intelligence can analyze vast amounts of data to tailor learning experiences to the individual needs and preferences of each student, allowing for a more personalized and engaging educational experience.

- Efficiency: Artificial intelligence can automate certain aspects of teaching and learning, allowing educators to focus on higher-level tasks such as providing feedback and support to students.

- Scalability: Artificial intelligence can be used to provide personalized learning experiences at scale, allowing educators to support a large number of students simultaneously.

- Real-time feedback: Artificial intelligence can provide real-time feedback to students on their progress, allowing them to adjust their learning strategies and stay on track.

Limitations:

- Bias: Artificial intelligence systems can perpetuate existing biases and inequalities in education, as they may be trained on biased data or be subject to the biases of their designers.

- **Data privacy:** The use of Artificial intelligence in personalized learning requires the collection and analysis of large amounts of student data, which raises concerns about privacy and data security.

- **Lack of human interaction:** The use of Artificial intelligence in personalized learning may limit opportunities for human interaction and social learning, which are important aspects of education.

- **Cost:** The development and implementation of Artificial intelligence-powered personalized learning systems can be expensive, making it inaccessible to schools and students with limited resources.

Overall, while Artificial intelligence has the potential to revolutionize personalized learning and improve student outcomes, it is important to critically analyze its strengths and limitations to ensure that it is implemented ethically and effectively. It is important to balance the benefits of Artificial intelligence with the need to maintain privacy, equity, and human interaction in education.

To create personalized learning experiences using Artificial intelligence, several steps are typically involved:

- **Collect data:** The first step in using Artificial intelligence to create personalized learning experiences is to collect data about each participant's learning needs, preferences, and strengths. This may involve collecting data on past performance, interests, learning style, and other relevant factors.

- **Analyze data:** Once the data has been collected, it needs to be analyzed to identify patterns and insights that can inform the development of personalized learning experiences. This may involve using machine learning algorithms to identify trends and correlations in the data.

- **Develop customized learning experiences:** Based on the insights gained from the data analysis, customized learning experiences can be developed that are tailored to each participant's individual needs and preferences. These experiences may involve a range of learning activities, such as videos, quizzes, games, simulations, and assessments.

- **Implement and monitor:** The personalized learning experiences can then be implemented, and the participant's progress can be monitored using Artificial intelligence-powered analytics. This can provide real-time feedback to both the participant and the educator, allowing for ongoing adjustments to the learning experiences as needed.

Overall, the use of Artificial intelligence in personalized learning involves a data-driven approach to identifying and meeting the unique learning needs of each participant. By using Artificial intelligence to collect and analyze data, customized learning experiences can be developed and implemented that are more engaging, effective, and meaningful for participants.

The implications of using Artificial intelligence in personalized learning are significant and have the potential to transform the way education is delivered. Here are some key implications for personalized learning and the use of Artificial intelligence in education:

- **Improved student engagement and motivation:** By tailoring learning experiences to the individual needs and preferences of each student, Artificial intelligence-powered personalized learning can increase student engagement and motivation, leading to better learning outcomes.

- **Enhanced student learning outcomes:** Artificial intelligence can help identify areas where students need additional support, and provide targeted interventions to improve their learning outcomes. By adapting to each student's unique learning style, Artificial intelligence-powered personalized learning can facilitate deeper learning and knowledge retention.

- **More efficient use of resources:** By automating certain aspects of teaching and learning, Artificial intelligence can free up educators' time to focus on higher-level tasks such as providing feedback and support to students. This can lead to more efficient use of resources and improved educational outcomes.

- **Ethical concerns:** The use of Artificial intelligence in personalized learning raises ethical concerns around privacy, bias, and equity. It is important to carefully consider these issues to ensure that Artificial intelligence is used in a way that promotes equity and accessibility for all students.

- **The need for educator training:** The use of Artificial intelligence in personalized learning requires educators to have a certain level of technical expertise and data literacy. As such, it is important to invest in educator training to ensure that they are equipped to effectively integrate Artificial intelligence into their teaching practices.

Overall, the implications of using Artificial intelligence in personalized learning are significant and have the potential to revolutionize the way education is delivered. By leveraging Artificial intelligence to create tailored learning experiences, educators can better meet the diverse needs of their students and promote deeper learning and engagement. However, it is important to carefully consider the ethical implications of using Artificial intelligence in education and invest in appropriate training for educators to ensure its effective and equitable implementation [3:268].

The thesis discusses the concept of personalized learning, which tailors instruction to meet individual student's needs, abilities, interests, and learning styles. It further explores the role of Artificial Intelligence in personalized learning and its impact on student achievement. The main findings highlight that Artificial intelligence can be used to create personalized learning experiences by analyzing data on individual student performance and providing customized recommendations and resources based on their strengths and weaknesses. The use of Artificial intelligence in personalized learning can offer benefits such as increased engagement, improved learning outcomes, and flexibility. However, there are concerns about potential ethical implications and the reinforcement of biases. The thesis also presents strengths and limitations of Artificial intelligence in personalized learning, such as personalization, adaptability, and scalability, but also the need for ethical considerations, data privacy, and data security.

References

1. Adebayo A.S., Olojede A.A., & Babatunde O.A. 2021. Artificial Intelligence in Education: A Review. *Journal of Education and Practice*, 12(4), 26-33.
2. Akcayir M., & Akcayir G. 2018. Advantages and challenges associated with augmented reality for education: A systematic review of the literature. *Educational Research Review*, 24, 1-23.
3. Arnold K. E., & Pistilli M.D. 2012. Course signals at Purdue: using learning analytics to increase student success. In *Proceedings of the 2nd International Conference on Learning Analytics and Knowledge*. -P. 267-270). ACM.

РЕЗЮМЕ. Ушбу мақоллада sun'iy intellektning shaxsiylashtirilgan ta'limdagi roli va uning talabalar yutuqlariga ta'siri ko'rib chiqildi. Sun'iy intellekt talabalar ma'lumotlarini tahlil qilish va individual ta'lim yo'nalishini yaratish va moslashtirilgan ta'lim jarayonini ta'minlaydi.

РЕЗЮМЕ. В статье рассмотрена роль искусственного интеллекта в персонализированном обучении и его влияние на успеваемость учащихся. Искусственный интеллект обеспечивает индивидуальный образовательный процесс, анализируя данные учащихся и создавая персонализированные траектории обучения.

SUMMARY. This article examines the role of artificial intelligence in personalized learning and its impact on student performance. Artificial intelligence provides an individual educational process by analyzing student data and creating personalized learning trajectories.