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Effect of AI in Enhancing Learning Environment

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Abstract: *This research aims to explore the integration of Artificial Intelligence (AI) in education, focusing on its impact on personalized learning and academic outcomes. Utilizing a descriptive methodology, questionnaires were administered to students, with statistical analysis revealing diverse opinions. Findings indicate a generally high positive perception of AI's effectiveness in personalized learning, with strong acknowledgments of academic improvements. However, challenges in implementation and concerns about creativity and motivation are evident. Stakeholders recognize the significance of AI in addressing diverse learning needs but express ethical considerations. The study emphasizes the multifaceted nature of opinions on AI in education, contributing valuable insights for future developments and ethical considerations. This research concludes to a centripetal point that the use of AI proves beneficial in academic performance, as well as proving viability in academic results.*

Introduction

Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. The integration of artificial intelligence (AI) in the educational environment has significantly transformed and influenced the learning environment by promoting personalized learning experiences, facilitating adaptive teaching strategies, adapting and optimize resource allocation, thereby helping students and educators achieve academic excellence. Computerized innovations such as artificial intelligence (AI), propel in data and computer innovation, gives openings to progress the instruction handle. It creates a wide extent of computerized arrangements for instruction in education, from online stages to technology and keen applications. The utilize of computerized advances increments both the generation and esteem of information, making unused openings to move forward instruction and instruction arrangements, but moreover modern challenges also come into play. Instruction frameworks have begun to alter their educational modules and aptitudes necessities and put a more grounded accentuation on aptitudes for advancement and citizenship in an AI driven period. The abilities required to enter and advance within the work advertised are experiencing significant changes, with more request and accentuation on complex abilities. With the inculcation of AI in education it comes with certain drawbacks as well, as everything has a positive and negative side. The induction of AI

in education has brought about significant changes in the overall academic lives of people. Advancement in education is of grave importance to promote quality knowledge and with better concepts for students to facilitate and grasp from easily. Progression within the instruction division is basic to oblige advancing ways of life, economy, innovation, and students' needs. Moreover, the increased scarcity of instructors within the instruction framework has made the integration of progressed innovation in our instruction framework fundamental. The use of AI shows how Chatbots will help in fathoming a few of the current challenges confronting the instruction sector AI that has been integrated into our lives for quite some time now. With the advancement of technology, AI is becoming part of our lives now embedding its roots deep into our lives. The fact that AI is in need nowadays' environment can't be denied, nor the fact that it is in fact the need of today's environment as majority of dependency relies in it. Despite the positive strides made in education through the integration of AI, it is crucial to acknowledge the drawbacks and challenges that accompany this technological shift. As education strives to evolve to meet the needs of a changing society, economy, and technological landscape, the scarcity of qualified instructors has made the infusion of advanced technology a necessity. The integration of AI into our daily lives has become increasingly pronounced, and its indispensable role in the current environment cannot be overlooked. While AI presents itself as a solution to many challenges, it is essential to tread carefully, acknowledging both its potential benefits and the need for ethical considerations. As we navigate this era of technological advancement, education stands at the forefront, shaping the future of individuals and societies through the intelligent integration of artificial intelligence.

Objectives

The research has been done keeping in view the main objectives which are:

1) To assess the pros and cons of personalized AI- driven learning experiences for students.
2) To assess the use of AI in education and its impact on students' academic performance and retention rates

Literature Review

Artificial intelligence or AI is a big subject in different areas. It's all about making computer systems act like humans think and behave (Gocen & Aydemir, 2020). Importance of AI in education, looking at views from different angles. Also understanding the good and bad things that could happen when it's added to education. As learning becomes a vital place for AI effect, (Karsenti, 2019) says that schools need to change with the digital world and use skills needed today. The study looks at how people see AI in education, bringing out the need for knowing what professionals working with kids and making machines think about how AI may change education. The study used content analysis to find main ideas from what the participants said. Goksel and Bozkurt found two big ideas about AI in education. These themes showed what people think are good or bad things related to using artificial intelligence with learning systems. The first theme talks about the good things that AI brings to school, including different uses of technology and results. This includes programs like simulations, systems to test and measure performance, classes with virtual reality, robots that help out students and individual learning setup. AI is viewed as a strong tool for helping with personal learning. This makes the education experience better for each student. The second theme talks about people's worries of the bad effects that could happen from many are using AI in education (Goksel & Bozkurt, 2019). These issues include treating information as a machine, focusing too much on knowledge instead of beauty feelings, less room for teachers to teach. There are also problems about what is right and safe things happening while it can hurt how people get along with each other. People are worried about losing their jobs. They think

robots might take over lots of work; including teaching. Tahiru employed a systematic review method to identify the current research focus on AI technology in education. Findings indicate opportunities for collaborative learning and relieving teachers of administrative duties were highlighted as positive impacts of AI in education (Tahiru, 2021). In another study done by Andriessen and Sandberg, the paper advocates for a nuanced understanding of AI's role in education, moving beyond the traditional ITS paradigm. The proposed framework facilitates the positioning of ongoing AI and Education research and aids in determining relevant research questions based on distinct educational scenarios. It calls for a comprehensive exploration of the relationship between educational goals and AI techniques to enhance the effectiveness of educational technology (Andriessen & Sandberg, 1999)

A study done by Vincent-Lancrin and Van der Vlies, AI to enhance educational processes and prepare students for evolving skillsets required in increasingly automated societies (Vincent-Lancrin & Van der Vlies, 2020). The study supported the G20 AI dialogue by presenting promising uses of AI in classrooms and education systems. In contrast to the study done by Holmes and Tuomi, the collaborative development of human and artificial cognition is proposed as the future of AIED, where technology augments human learning and cognition (Holmes & Tuomi, 2022). The article aims to assist readers in understanding the historical context, current state, and potential roadblocks in integrating AI into education while acknowledging the unpredictable yet transformative future of education in the digital era. Shedding light over the work of (Wang, Liu, & Tu, 2021), the literature review synthesizes findings from a study on teachers' intention to adopt AI in higher education. It emphasizes the importance of factors such as attitude, self-efficacy, and perceived ease of use in shaping teachers' intentions. Through the perspective of Mhalanga's, Artificial intelligence, a significant contributor to these changes, has witnessed substantial advancements, exemplified by Open AI's ChatGPT. Positioned as innovative technology, ChatGPT holds the potential to revolutionize education. However, its implementation demands adherence to principles of responsibility and ethics. This article focuses on providing a comprehensive review of the ethical and responsible use of ChatGPT in education, encouraging further research and discussion on this crucial subject (Mhlanga, 2023). In a review by (Akgun & Greenhow, 2021), the pervasive influence of AI in modern society is undeniable, with applications ranging from search engines and email services to healthcare and education. The COVID-19 pandemic has further emphasized the dependence on AI systems. This paper delves into the field of AI in education settings, outlining the applications of AI, its definitions, and the societal impact of AI systems.

The concluding remarks by Qadir emphasize ChatGPT's potential as a valuable tool for engineering education, offering capabilities ranging from virtual tutoring to research assistance. However, it underscores the importance of responsible use, acknowledging the imperfections of AI language models (Qadir, 2023). The need for community guidelines and standards for fair use is emphasized, along with considerations for equitable access and education to prevent aggravating existing inequalities. In contrast to work done by Gide and Sandu, the concept of "Education 4.0" involves integrating AI into a learner-centered education system, serving as an essential upgrade from traditional tutor-centered approaches. Acknowledging the challenges in the education sector, including teacher scarcity, this paper explores the potential of Chatbot technology to address these issues (Sandu & Gide, 2019). How and Hung introduces the concept of "AI-Thinking" within the realm of STEAM education, emphasizing the co-emergence of human-centric reasoning and AI analysis. The goal is to leverage AI analytics, particularly predictive analysis, and simulations, to draw out AI-Thinking skills in learners. The integration of AI in education is viewed as an opportunity for STEAM practitioners to transform human-centric ideas into technical inputs for AI technologies (How and Hung, 2019).

According to (Limna et al., 2022) The rapid advances in big data and artificial intelligence have profoundly impacted education, introducing predictive, diagnostic, and decision-making capabilities that support diverse learning contexts. Over the last 25 years, significant progress in AI adoption has been witnessed in education, creating new opportunities and challenges. AI applications, ranging from personalized learning to automated assessments, promise extensive benefits by providing detailed feedback, facilitating active learning through social media integration, and enhancing overall educational experiences. The literature underscores the need for collaborative efforts among academics, educators, policymakers, and professionals to address the challenges and opportunities presented by the big data explosion and AI revolution, ensuring learners acquire essential competencies for the knowledge economy. In conclusion, the adoption of AI in education emerges as a critical and transformative topic, poised to revolutionize traditional educational models and enhance the overall learning experience for both educators and students.

Methodology

The type of research done is descriptive form. The data collection tool devised in this study is primarily that of a questionnaire, with questions asked from students of different age groups, batch levels, and semesters of Bachelors and MPhil level. The questions asked were from 20 people taken on general account, picked from random fields, who had been in touch with the use of AI in their fields for help. This method of research has been chosen because most of the data collection is done by observing the questionnaires handed to them and opinions taken through general open ended questions given by people and analyzing them accordingly. The scale used was Likert Scale giving the level of agreement and disagreement of the selected samples on a scale of 1 to 5. The data is analyzed through ‘mode’ form of descriptive analysis. Ethical considerations are taken into account as the participants were informed of the nature of the research and their identity was kept discreet for better results. For reliability and validity, the participants were taken on purely random basis. Out of 22 asked questions, 20 were close ended and the 2 were open ended to get broader spectrum of opinions from people.

Theoretical framework

Behavioral Intention (BI)

The theory states that people's plans to use a technology are affected by how useful they think it is and how easy it is for them. Looking into teachers' and students' plans to use AI tools in their teaching or learning activities can help us understand how successful it might be for them. The Technology Acceptance Model (TAM) says that wanting to use it, is important in accepting new technology. This especially matters when teachers and students start using AI tools in their school work. The model asserts that individuals' intentions to use a technology are shaped by two primary factors: seen helpfulness and seen ease of use. We believe that using AI tools will make teaching or learning better. We think they can help with things like making work more efficient and getting good results. In other words, ease of use is about how easy a person thinks it will be for them to understand and use the technology. For teachers and students, this means checking if AI tools are easy to use, open for all and don't need too much technical know-how. These things directly affect the want to use, with extra thoughts like what others think and making it easy adding to how much people accept AI tools in schooling. Recognizing and handling these elements is important in making AI technologies work well for schools.

Research Significance

This research aims to provide a detailed analysis of the pros and cons of using AI in education, also highlighting the impact of AI in the academic results in the lives of students; To provide understanding

about how it effects the lives of people and what are the disadvantages and loopholes left behind by such a strategy of inducing the AI into the lives of students and users.

Research Questions

The main questions addressed in this research are:

Q. 1: What are the potential pros and cons of AI in personalized learning?

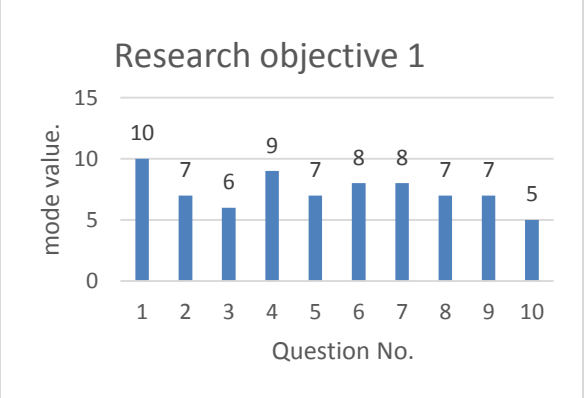
Q. 2: what is the impact of AI on educational outcomes such as academic achievement and retention rates?

Data Analysis and findings

From the statistical data derived from closed ended questions is as follows:

Likert scale count	Assigned values
strongly disagree	1
disagree	2
neutral	3
disagree	4
strongly disagree	5

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode
1	1	2	1	10	3	10
2	0	3	3	7	4	7
3	1	0	6	5	5	6
4	2	2	1	9	3	9
5	0	7	2	4	4	7
6	0	2	8	7	0	8
7	1	8	4	4	0	8
8	0	3	5	7	2	7
9	0	3	0	7	7	7
10	0	3	5	4	5	5
11	1	2	2	8	4	8
12	0	0	3	12	2	12
13	2	1	1	11	2	11
14	0	2	4	8	3	8
15	1	4	3	6	3	6
16	0	3	3	8	3	8
17	0	1	1	11	4	11
18	0	3	4	8	2	8
19	0	2	5	9	1	9
20	0	0	3	7	7	7



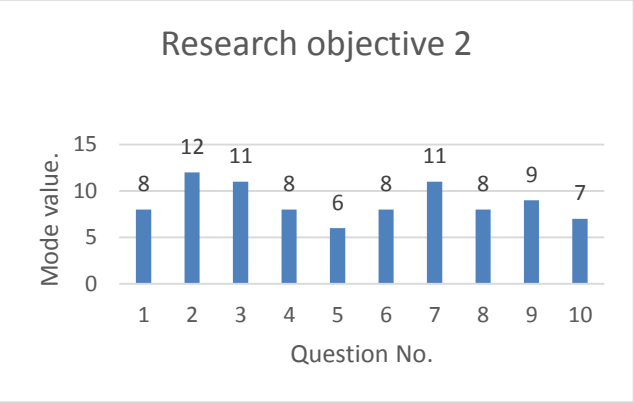


Table No. 1 **Table No.2**

The number of responses that got selected out of 20 were 17. The reason behind discarding 3 responses was due to the wastage of those questionnaires because of the false input of data of the participants who were either ignorant or had little knowledge of the field, thus providing nuanced data. Out of the 17 selected participants, the statistical quantitative data analysis for closed ended questions asked is as follows:

General findings from closed ended questions

Effectiveness of Personalized AI-Driven Learning

Most people think that learning from AI-driven programs made just for them works well, maybe because they had good experiences or saw positive outcomes. The number who strongly agrees shows that most people think AI learning works well. The few people who do not agree might have a different opinion, maybe affected by their own experiences, or worries. In short, most people agree with the fact that AI has contributed much to enhance the overall effectiveness of personalized AI driven learning. People stick to the coherency of the statement that AI has positively influenced their effectiveness.

Satisfaction with Academic Improvement

People are happy with the better grades they get at school because of personalized learning helped by AI. Many people agreed and a few more strongly agreeing shows that they feel good about how AI affects school results. A few people might have different views or experiences. Overall, the general perspective of the people remains of the view that AI has caught up to their expectations with academic improvement.

Engagement and Motivation

People have different feelings about being more interested and eager to learn in personalized AI-based educational experiences. Many people being neutral, a sum shows a wide range of experiences or disagreement on the engagement side. The same amount of people agreeing and strongly agreeing, shows a pleasant view from some partakers. According to the participants, they have a neutral review with the engagement to the content and increased laziness while some agree that it has increased their motivation and engagement with the content. Overall, the scale tilts towards the positive side of engagement.

Perceived Impact on Learning

Most people agree that personalized learning with AI really makes a significant difference in how we learn. Some people who did not agree or were unsure might have different expectations and experiences about how AI can change learning results. But as for the other side, a lot of people strongly

agree that it has made learning way too much easier and simplified. Vast and difficult terminologies have been made quite easy.

Addressing Diverse Learning Needs

According to the students, teachers have different opinions about how well AI-led education meets the various learning needs. Many of them agree with this view. Some people might not agree or strongly disagree with others, which could mean they have different views or experiences as teachers.

Student's Perception

Most students say that personalized learning using AI helps them in schoolwork and overall education. Overall, the students provided an incredibly positive response in this aspect.

Challenges in Implementing AI-Driven Learning:

Many students say that they have big problems using individual learning with AI. This might mean acknowledging real problems or obstacles in using AI-based learning methods. That may be due to their ignorance from the field. Or the difficulty in the inculcation of AI into the education systems.

Perceived Significance of Retention Difference

People often agree that the difference in how well students remember class material is important for those who use AI-driven personal learning. This means that people agreed about how much they think AI will affect keeping learning stuff.

Attitude Change with AI-Driven Educational Content

People usually say that when students see personalized education stuff made by AI, they feel differently about learning. A lot of people agree and strongly agreeing shows that students like the effect AI-made content has on their opinions. Their attitude towards learning changed drastically. AI has made educational content easier and simplified.

Ethical Issues

People have different ideas about whether there are right or wrong issues related to using AI in personalized learning. The same number saying yes and strongly agreeing, shows they understand ethical thoughts. Some people do not agree or have no opinion, which means different ideas about ethics too. A considerable amount showing that AI has created ethical issues, cannot be denied. It certainly is true that AI has created ethical issues, due to its abuse being used in negative ways.

For open ended Questions

Response to Question No. 1	Frequency	Percentage
Easy access to knowledge	6	22.22%
Decreases creativity	5	18.51%
Saves time	5	18.51%
Helpful	4	14.81%
Increases efficiency	4	14.81%
Helps in assignment	3	11.11%

Response to Question No. 2	Frequency	Percentage
Positive response in academic results	10	58.82%
Negative effect on academics	3	17.64%
Decreases motivation	2	11.76%
Increases laziness	2	11.76%

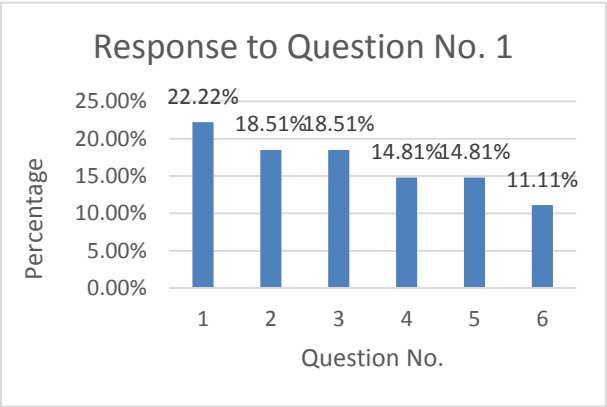


Table No.1

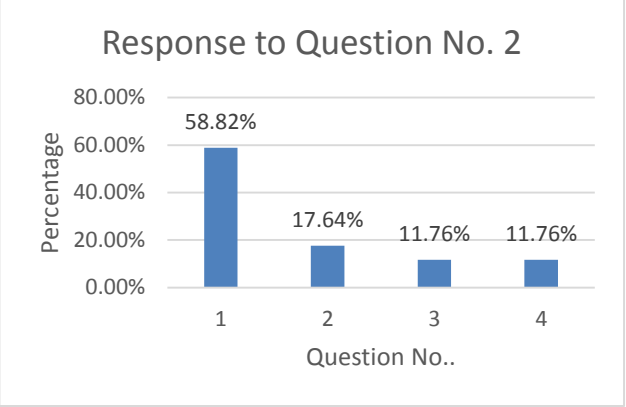


Table No.2

For opinion-based open-ended questions (Question No. 1)

22.22% views stated that AI helped with the ease of access to knowledge

This means that many people who answered the survey understand AI can make educational stuff easier to get. It could mean things like suggestions based on what you want or smart learning tools that make it easier to get information. According to the participants AI has provided diverse knowledge and understanding regarding topics and content.

18.51% views stated that the use of AI decreases creativity

Some people think that using AI in schools might hurt creativity. People might have this view because they worry about standard ways or think that there is less room for creative thoughts. In their views AI is reducing creativity and effecting negatively.

18.51% views stated that the use of AI saves time and efforts

People agree that AI is quicker, and they see it as a way to save time in teaching. This could be because of automatic processes or customized learning methods that focus on what each person needs and what improvements need to be made.

14.81% views stated that the use of AI proved helpful in overall academic endeavor

This means that people generally think AI is good for education. People probably view AI as a helpful device that improves education all around. They also agree with the fact that it has improved academic success.

14.81% views stated that it increased the efficiency of the students

People accept that AI can help students work better. This could be due to AI tools that offer focused help. These tools aid students in managing their time and resources better.

11.11% views stated that it helped a lot in assignments and content compilation skills

This point of view shows that AI is seen as useful for specific school jobs, mainly in homework and gathering materials. AI could be seen as a helpful tool for organizing and showing information.

For opinion-based open-ended questions (Question No. 2):

58.82% views stated that AI has a positive impact in enhancing educational environments

Most people say good things, showing they think AI helps schools in a positive way. Maybe it does this through innovative ideas or giving students special learning experiences and better ways to get needed stuff.

17.64% views stated that AI has negative effects on the educational environment

Some people do not like AI in schools. They are worried or see sad things happening because of it. These worries might be about issues like privacy, fairness or using technology too much. Also raises questions about reliability.

11.76% views state that the use of AI decreases motivation levels in students

This idea shows worry about how AI might affect students' drive to learn. It might come from fears about people becoming less involved or caring less in learning when some jobs are done by machines.

11.76% views state that the use of AI inculcates laziness in students

Some people worry that AI might make students lazy. People might worry that students rely too much on AI tools, which could harm their work ethic or self-control.

Conclusions

Participants think mostly good about the significant amount of change that has been brought about by the use of Ai in daily life. Many people think that learning with AI, works well. Strong agreement shows good experiences. But some people have different ideas. They might show their own experiences or worries in a unique way. Many people think that personalized AI-led education raises engagement and motivation. Most disagreement shows that mostly students see things the same way as using school computers to help teach better. But some of them who have different thoughts or doubts show that they think and feel in many ways. Recognizing issues with students using AI-driven learning shows an understanding of real problems or hurdles in applying learning methods based on artificial intelligence. People think AI is important to help students remember what they learn in class. This highlights the value of using computer-based personal learning for keeping things in memory. However, people have different views about the morality of AI in personal learning. This shows they understand its ethical sides, some agree or disagree while others do not know for sure what to think. The comments show that people mostly see a pleasant view on learning with AI personalization. However, there are some worries and different thoughts about how this will affect creativity, motivation, and ethical consideration. The effectiveness of AI in meeting individual learning needs is recognized, but challenges in implementation and concerns about potential negative consequences warrant attention. Overall, according to the participants AI has shown grave change in their lives, improving their effectiveness and efficiency. Shedding light over the educational and academic outputs, the majority of the people agree that AI has contributed very positively to their success and achievement. They strongly agree that AI has brought about positive change.

Suggestions and Recommendations

The integration of artificial intelligence (AI) into education is undoubtedly a promising venture with transformative potential. To further enhance the efficacy of this integration, several recommendations can be considered.

1) Fostering a collaborative approach among stakeholders is paramount. Collaboration between educators, technologists, policymakers, and industry experts can lead to the development of comprehensive strategies. This collaborative effort should aim to establish clear objectives for integrating AI into education, ensuring alignment with the evolving needs of students and the demands of the workforce.
2) Investment in professional development for educators is essential. The rapid evolution of AI technologies requires educators to be well-versed in their applications and implications. Workshops, training programs, and ongoing support can empower educators to harness the full potential of AI in

their teaching methodologies. This investment is crucial to bridge the gap between technological advancements and the skills of educators.

3) Additionally, there is a need for the development of ethical guidelines and frameworks governing the use of AI in education. This ensures that the deployment of AI technologies aligns with ethical standards, respects privacy, and avoids biases. Policymakers should collaborate with experts to create guidelines that strike a balance between innovation and ethical considerations.
4) Moreover, the creation of adaptive learning platforms that cater to individual student needs should be prioritized. AI can play a pivotal role in personalizing learning experiences, addressing diverse learning styles, and providing real-time feedback. Investing in the development of such platforms can significantly enhance the quality of education.

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Appendices

The questionnaire, with research questions devised, is as follows:

Instructions: Thank you for taking the time to participate in our questionnaire. Your insights are important to us. Please use the scale provided below to express your agreement or disagreement with each statement. Your honest responses are crucial.

1: Strongly Disagree

2: Disagree

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1)According to students personalized Artificial intelligence (AI)-driven learning has shown effectiveness?					
2)People have shown high satisfaction level of improvement in academic performance among students who engage with personalized AI-driven learning?					
3)Do you feel much more engaged and motivated when participating in personalized AI-driven learning experiences?					
4)Personalized AI-driven learning has enormous impact on learning.					
5)AI-driven learning addresses the diverse learning needs of students in a classroom setting, according to educators?					
6)According to parents personalized AI-driven learning has an impact on their child's academic progress and overall educational experience?					
7)Does students face most significant challenges reported by them in implementing AI-driven personalized learning?					
8)The percentage difference in the retention of course material between students who engage with personalized AI-driven learning and those who do not is significant?					
9)Does students' attitudes toward learning change when exposed to personalized AI-driven educational content?					
10)Ethical issues related to the use of AI in personalized learning among students exists?					

3: Neutral

4: Agree

5: Strongly Agree

Open Ended Question: How do students, educators, and parents perceive the overall impact of personalized AI-driven learning experiences, and what specific factors contribute to their perspectives?
Answer:

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1)The integration of AI positively influenced students' academic achievement in education?					
2)You perceive the correlation between the use of AI in education and improvements in students' academic performance?					
3)Do you believe that AI in education has contributed to a more personalized and effective learning experience for students in academic results?					
4)You feel satisfied with the current impact of AI on educational outcomes, considering its effects on academic achievement?					
5)The use of AI in education will continue to positively impact students' academic success in the future?					
6)You perceive AI as a contributing factor to academic advancements in students?					
7)AI aligns with and supports the educational objectives aimed at improving academic performance?					
8)Do you think the current use of AI in education addresses the diverse learning needs of students?					
9)Would you rate the impact of AI on narrowing educational achievement gaps among students?					
10)Do you think it's use assess the overall effectiveness of AI in education in enhancing students' academic outcomes?					

Open Ended Question: How do you perceive the s and multifaceted impact of AI on educational outcomes, particularly in relation to students' academic achievement, and what specific factors contribute to your perspective?
Answer: