AI and the Future of Learning: Personalization, Equity, and Ethical Challenges

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Abstract

By encouraging individualized learning and the creation of moral challenges that need serious thought, artificial intelligence (AI) is revolutionizing education (Roll et al., 2021; Selwyn, 2019). Examining how AI may improve personalized learning, advance equity and accessibility, and tackle ethical dilemmas was the goal of the current study. This paper examines the important role of AI in education, focusing on how it affects individualized instruction, equitable access to learning materials, and the moral conundrums raised by algorithm-based decision-making. To fully comprehend AI's impact in educational settings, the study used a mixed-methods research approach that combines quantitative and qualitative techniques. The study was restricted to universities that used AI-powered learning resources. Faculty, students, and EdTech experts from Pakistani public and private colleges that have incorporated AI-based learning resources make up the study's population. To guarantee a varied representation from both public and private universities, a stratified random sample technique was used. Surveys and semi-structured interviews were used to collect data on how well AI might tailor learning and alleviate educational disparities. In order to discover ethical concerns and issues, a validated questionnaire was developed to gather perspectives regarding AI-driven learning, and thematic analysis was utilized to analyze qualitative data. In order to help policymakers, educators, and tech developers create appropriate AI-driven learning environments, the project's outcomes would provide empirical evidence about the benefits and drawbacks of AI in education.

Key words: Artificial Intelligence in Education, Personalized Learning, Educational Equity, Ethical AI in Learning, Technology-Driven Pedagogy

Introduction

Artificial intelligence (AI) has also played a substantial role in both curriculum development and pedagogy. AI-driven technologies have emerged as a pivotal element to improve understanding of student learning processes as well as the identification of more efficient teaching techniques (Luckin, 2022; Holmes et al., 2022). With these advancements in the use of artificial intelligence (AI), it is now possible to provide more effective personalized education in a way that benefits students, tutors, and teachers (Selwyn, 2019). However, the application of AI in learning activities poses many issues in terms of equity, access, and ethics. One of the key education technologies that has the potential to introduce meaningful positive changes is AI in education. Through the use of AI technology, teachers can be personalized because of the character of their learning environment (Woolf, 2020). With these advantages AI technology can make personalized learning possible in learning environments, which can be a highly advantage for disadvantaged learners (Williamson & Eynon, 2020). Along with this, ethical issues like algorithmic bias, data privacy, and the evolving role of human instructors in the AI-facilitated setting can be critically examined (Aoun,et al., 2018). This work is therefore compelled to consider the way that AI will change personalized learning in learning settings, this will leave a profound mark on educational equity, and the moral challenges that emerge amid utilization of AI in instruction.

Research Objective

The study was undertaken with single research objective, 'to explore the role of AI in future learning to optimize personalized learning, facilitate accessibility and equity and meet ethical issues'.

Literature Review

AI and Personalized Learning

Artificial intelligence (AI) systems are utilizing machine learning algorithms in order to analyze the performance of the students and customize the instructional material as per their needs. Luckin et al. (2021) determine through study that platforms like Khan Academy and Coursera use real-time data analysis so as to tailor learning experiences, and this yields higher levels of engagement and improved learning outcomes. AI-facilitated educational software can identify where learners may be struggling and provide them with focused assistance, which makes the learning process more efficient (Holmes et al., 2022).

A work by Woolf (2020) reveals that AI-based intelligent tutoring systems (ITS) have the potential to mimic human tutors, providing one-on-one support and evaluation. These systems have been shown to enhance student motivation and retention, especially in science, technology, engineering, and mathematics (STEM) fields. Moreover, adaptive learning platforms such as Dream Box and Knewton employ AI to track students' progress and adaptively adjust their teaching (Selwyn, 2019).

On the contrary, critics also alert that over-reliance on AI interferes with the critical thinking of students because feedback from machines will definitely promote memorization rather than proper understanding. Studies also alert that AI personalization would enhance existing learning procedures, depriving learners of opportunities to test diverse ways of approaching problems (Williamson & Eynon, 2020).

AI and Educational Equity

AI possesses an incredible potential to expand education to make it accessible to marginalized groups. With technologies such as automated translation and AI-based

accessibility features, learning becomes more inclusive to all, including the disabled (Selwyn, 2019). For instance, AI-based speech-to-text and text-to-speech tools have made much greater accessibility for visually or hearing-impaired students, enabling a more inclusive learning environment (Luckin, 2021).

Yet, we cannot overlook unequal access to technology, which opens significant questions around the digital divide. Evidence demonstrates that AI educational tools are increasingly accessible in wealthy regions while the students in impoverished areas suffer due to poor infrastructure (Holmes et al., 2022). According to a UNESCO Institute for Statistics (Wallet, 2015) report, the disadvantaged schools lack access to AI-based learning tools because of inferior internet connectivity as well as absence of training teachers.

Also, while AI can promote educational equity, it also poses the threat of algorithmic biases. Aoun (2018) writes that biased data-trained AI models will replicate existing inequalities in grading, admissions, and educational recommendations. Facial recognition software to track students has already demonstrated racial and gender bias, which is a serious problem in terms of fairness in tests (Williamson & Eynon, 2020).

Current studies also inform us about AI's impact on international education policy. Zawacki-Richter et al. (2019) find that AI-driven testing has the potential to undermine students with a non-Western cultural background as it is built on biased data. AI-driven automatic testing is bound to miss out on understanding human intelligence's depth, especially in the creative and social sciences.

Ethical Challenges in AI Education

The usage of AI in education raises some thoughtful ethical concerns, particularly regarding data privacy, algorithmic bias, and the role of educators. AI-based learning software collects a whole lot of student data, raising big questions around data security and whether students have consented (Holmes et al., 2022). A research by Selwyn (2019) reveals that most of the AI platforms are not transparent when it comes to processing student data, which may expose students to privacy breaches.

Algorithmic bias is also a serious issue. Machine learning algorithms trained on past data can end up perpetuating social injustices, such as grading software based on machine learning that discriminatorily harms minority students (Ng, 2016).Woolf's paper (2020) states that AI recommendation algorithms tend to steer students unknowingly into study streams in alignment with gender stereotypes and confine them.

In addition, as the applications of AI broaden, fears exist regarding how instruction changes. Although AI can assist instructors by handling administration, there is a fear it could substitute educators in certain environments (Aoun, 2018). Reduced human interaction through AI classrooms would impact students' social and emotional development, leaving collaborative learning not as effective (Luckin, 2021).

To address these challenges, researchers are urging ethical AI systems that prioritize transparency, accountability, and inclusivity (Holmes et al., 2022). Governments and schools must establish policies governing AI in schooling so that it's fairly and ethically utilized (Williamson & Eynon, 2020). Further research from Veletsianos & Houlden (2020) opinions to the need of interdisciplinary viewpoints in AI ethics, highlighting the need for educators, technologists, and policymakers to work together.

Methodology
Research Design
In order to investigate the ways in which AI contributes to equity, individualized learning, and the moral conundrums that accompany these concepts, we used a mixed-methods research approach. The researcher conducted surveys to gather quantitative data, and we also conducted semi-structured interviews with EdTech specialists, instructors, and students to gather qualitative data.

Universities and other higher education institutions that have implemented AI-based learning resources, both public and private, were included in our study. Our respondents, which included 200 academics, 400 students, and 120 EdTech practitioners, were selected using a straightforward sampling technique.

Tool Development Process
To develop the research instruments, including the survey questionnaires and the interview, the researcher used literature and consulted experts. The questionnaire was designed to gauge the extent to which the participants view AI's effect on personalization of learning, equity, and ethical considerations. It captured five overarching themes: AI personalization, accessibility and equity, ethical concerns, the position of AI on teachers, and the challenge of AI in education in the future. There were 25 research statements based on a five-point Likert type scale ranging from Strongly Disagree to Strongly Agree. There were 10 open-ended structured interview questions which attempted to probe further into participants' thoughts concerning AI in education.

Validity and Expert Opinion
Five experts in pedagogy, EdTech development, and AI in education closely examined the research tools to ensure the content was authentic. Their feedback ensured that the questions were relevant and in line with the objectives of the study.

Reliability and Pilot Testing
The researcher conducted pilot testing with 30 participants that included 10 faculty members, 15 students, and 5 EdTech experts to see how reliable the measure of the survey was. We measured reliability using Cronbach's alpha, and we got a coefficient of 0.87, which is an extremely high level of internal consistency.

Data Collection and Data Analysis
Data Collection
The researcher gathered data through a mix of structured surveys and in-depth interviews. The surveys were sent out online to faculty members, students, and EdTech professionals from both public and private universities. For the interviews, we handpicked participants to dive deeper and collect rich qualitative insights. The whole data collection process took about three months.

Data Analysis of Questionnaire
For the quantitative data, the researcher processed it with SPSS through descriptive statistics, factor analysis, and regression modeling. On the qualitative front, we conducted thematic analysis of interview data to discern dominant themes regarding AI's effect on personalized learning, equity, and ethical concerns.

Table 4.2.1
Factor 1: *AI-Driven Personalization*

Research Statement	Mean Score	Standard Deviation	Analysis
By adjusting to the needs of each individual student, AI enhances personalized learning.	4.3	0.72	Strong consensus regarding AI's contribution to personalization.
AI-powered tutoring programs increase student involvement.	4.1	0.78	Favorable reaction to tutors driven by AI.
AI provides immediate feedback to raise student achievement.	4.2	0.75	Participants prefer AI's real-time feedback.
Customized instruction is enhanced by AI-generated learning pathways.	4.0	0.79	There is moderate consensus regarding AI's influence on educational pathways.
AI is able to evaluate and forecast the learning outcomes of students.	4.1	0.77	Encouragement of AI's predictive analytics in the classroom.
Overall Mean Score	4.14	0.76	It is generally acknowledged that AI-driven personalization enhances educational experiences.

The data provided in table 4.2.1 reveals that the participants are in strong agreement regarding the capacity of AI to individualize learning. With an average score of 4.14, it is clear that the participants recognize AI-based tools to be effective tools of making learning individualized based on individual learning requirements, motivating learners more, and offering instant feedback. Whereas AI-based learning streams and predictive analytics also are recognized as helpful, they did not receive slightly lower agreement. The data signifies the overall dominance of AI to individualize education, ultimately making the process of learning student-centric and effective.

Table 4.2.2
Factor 2: *Accessibility & Equity*

Research Statement	Mean Score	Standard Deviation	Analysis
AI restores educational opportunities for students with disabilities.	3.9	0.81	AI-based learning platforms are available to all students.
AI reduces educational disparities for students from disadvantaged backgrounds.	3.7	0.85	Reactions to AI's contribution to gap closure were mixed.
Non-native speakers are supported by AI-powered translation tools.	4.1	0.78	Favorable opinion of AI's contribution to multilingual education.
AI-powered adaptive learning systems accommodate a range of learning requirements.	3.8	0.80	AI in inclusive education is moderately agreed upon.
Students have access to AI-based	3.6	0.86	There is some consensus

learning platforms.			regarding AI's place in inclusive education.
Overall Mean Score	3.82	0.82	Although there are still issues with accessibility, AI is viewed as a tool for inclusivity.

The analysis presented in table 4.2.2 on accessibility and equity in AI-driven education shows a moderate overall mean score of 3.82. This score reflects both the promise and the challenges that AI brings to the table when it comes to providing equal learning opportunities. While many respondents recognize the positive impact of AI in helping students with disabilities and supporting those who speak multiple languages, there are still worries about its ability to truly bridge educational gaps. Affordability and the reach of AI-based education platforms are significant hurdles, with varied opinions indicating that access to these technologies isn't yet widespread. This highlights the ongoing digital divide that persists, even with all the technological progress we've made.

Table 4.2.3
Factor 3: *Ethical Concerns in AI Integration*

Research Statement	Mean Score	Standard Deviation	Analysis
Data privacy risks are associated with AI-based learning tools.	4.4	0.70	Extremely concerned about privacy issues.
AI's algorithmic biases perpetuate disparities in education.	4.2	0.74	Concerns about bias are widely agreed upon.
AI-generated content in education is not ethically supervised.	3.9	0.80	Some skepticism regarding the ethical implications of AI.
Education trust is impacted when AI decision-making is unclear.	4.1	0.76	There is consensus that AI accountability is necessary.
AI-powered evaluations might not always be discrimination-free.	4.0	0.79	Fairness in AI evaluations is a moderate concern.
Overall Mean Score	4.12	0.76	Participants draw attention to bias, privacy, and transparency issues as ethical hazards in AI-driven education.

In table 4.2.3, the ethical issue was a high-priority item with a mean rating of 4.12. The most urgent issues are data privacy, algorithmic bias, and transparency of AI's decision-making. The respondents are worried that AI will further widen education disparities if biases are embedded in the algorithms. There are concerns that AI-generated content will be deficient in proper ethical scrutiny and that AI-based tests can have disproportionate effects on specific groups. This reflects an emergent need to have more regulative controls to ensure that AI is being used effectively in learning environments. These findings require the enforcement of stricter ethical requirements and transparency measures in the use of AI in learning environments.

Table 4.2.4
Factor 4: *AI's Impact on Educators*

Research Statement	Mean Score	Standard Deviation	Analysis
AI can support human educators, but it cannot take their place.	4.5	0.68	Strong consensus that AI should assist teachers rather than replace them.
By automating assessments, AI lessens the workload for educators.	4.0	0.77	AI in assessment automation is moderately supported.
AI-powered insights assist teachers in customizing their lessons.	4.1	0.75	Favorable opinion of AI's contribution to lesson planning.
Teachers' ability to track students' progress is improved by AI.	4.2	0.73	There is broad consensus that AI can help with monitoring.
Lesson plans produced by AI might restrict teachers' creativity.	3.7	0.82	Reactions to AI's impact on teacher autonomy were mixed.
Overall Mean Score	4.10	0.75	Despite ongoing worries about teacher autonomy, AI is viewed as a helpful tool for educators.

The result in table 4.2.4 is high agreement among members, indicated by a sum mean score of 4.10, that AI is to be applied to assist and not replace teachers. The majority of them welcome the use of AI to assist in workload management by automating grading and aid teachers in individualizing teaching. There are concerns, however, that AI-generated lesson plans will suppress the creativity of teachers. AI is seen as an assistant to a teacher, however; balance should be maintained in applying AI so as not to limit the scope of teaching but enhance it. Implications of the results are sustaining the human-touch focus of teaching where AI is applied.

Table 4.2.4
Factor 5: *Future Challenges of AI in Education*

Research Statement	Mean Score	Standard Deviation	Analysis
Institutional preparedness is a prerequisite for the widespread adoption of AI in education.	4.2	0.73	strong consensus regarding AI's reliance on infrastructure.
It is necessary to create ethical AI governance guidelines.	4.3	0.71	There is broad consensus that regulations pertaining to AI are necessary.
Effective AI integration necessitates ongoing faculty training.	4.1	0.76	The necessity of faculty development is acknowledged.
Traditional educators may oppose the adoption of AI.	3.8	0.80	Some faculty members are worried about AI resistance.
The roles of educators will be	4.0	0.78	There is moderate consensus

redefined by future developments in AI..			regarding AI's changing influence on education.
Overall Mean Score	4.08	0.76	The significance of institutional preparedness, governance, and training for AI adoption is emphasized by the participants.

The results of section 4.2.5 revealed that the list of issues was given a mean score of 4.08 by the participants in assigning it to future AI adoption. Institutional readiness, faculty training, and ethical leadership were the most important issues to the adoption of AI in education without a hitch. Although overall positivity on what AI can do has been documented, participants also showed that hesitation on the part of traditional teachers and complexity in the task of re-mapping the teacher's role are barriers. Institutions, the results show, must invest in training programs, infrastructure, and ethics policy so that the transition to AI-reliant learning can be accomplished without interruption.

Across all five dimensions, strong evidence on the part of the use of AI in education is present in the data but accompanied by a serious taking into account of ethics, access, and institutional readiness. AI-driven personalization was most popular, and ethical concerns and access implications were both given priority. The study confirms once again that if AI use is to be implemented in education successfully, it will have to be accompanied by ethical protection, policy of equitable access, and ongoing teacher training.

Data Analysis of Structured Interviews

To provide richness to the numbers, the researcher conducted qualitative understandings via semi-structured interviews of 30 participants, including 10 faculties, 15 students, and 5 EdTech experts. These discussions touched upon diverse views regarding AI-powered personalization, accessibility and equity, ethics, the impact of AI on teachers, and challenges ahead. The researcher transcribed their responses and analyzed thematically to identify recurring themes. The readers are presented below with the thematic analysis of the 10 open-ended interview questions divided into the five main factors.

Theme 1: AI-Driven Personalization

Q1: What is your vision regarding the future of adaptive learning through personalized education using AI?

Q2: What are the principal pros and cons of adaptive learning based on AI?

Findings

- The majority of participants concurred that AI was applicable for personalization of content, providing real-time feedback, and identifying areas in which students fall behind.
- The teaching staff identified the fact that, although AI improves student engagement, it does require ongoing checks so that accuracy remains intact.
- Some students grumbled that AI suggestions could not always align with their own learning paces and can sometimes be very restrictive.

Representative Quote

" AI-based tutoring actually helps me to understand difficult topics, but it sometimes disregards my own learning style and adheres to rigid models." (Student, Public University)

Theme 2: Accessibility & Equity

Q3: In what ways does AI contribute to mitigating educational inequalities?

Q4: What are the challenges we encounter in providing education based on AI to all students?

Findings

- AI introduces assistive technology for disabled children and provides language support for the majority of languages but its use in underprivileged regions is still low because of infrastructural problems.

- Private university professors have valued AI for making digital content accessible, while public university professors noted the expense aspect.

- EdTech professionals introduced the gap between the access of AI in urban and rural spaces and emphasized policy reform to connect the gap.

Representative Quote

"A.I. could possibly scale education to include many more, but there's unequal access to technology which is a huge issue we have to address on the policy side." (Faculty, Private University)

Theme 3: Ethical Concerns in AI Integration

Q5: What are the major ethical issues with AI in education?

Q6: What's your view of the impact of AI on decision-making and data privacy within the education system?

Findings

- Every respondent was concerned about data protection and risk of bias in AI algorithms.

- Staff revealed that AI models would be prejudiced against some students if they were not trained on mixed data sets.

- EdTech experts stressed the importance of transparency of AI-based suggestions and stricter regulatory standards.

Representative Quote

"AI in education has huge possibilities, but unless there is proper governance, it will end up reinforcing biases rather than erasing them." (EdTech Expert)

Theme 4: AI's Impact on Educators

Q7: In what ways do you think AI is redefining the role of the teacher?

Q8: What do you think are the benefits and the risks of using AI-based teaching?

Findings

- Most educators agreed that AI was a wonderful utility for cutting their workload in terms of grading and tailoring learning to students' unique requirements.

- However, certain instructors were afraid that excessive reliance on AI would disqualify human instinct and curb teacher ingenuity.

- Students liked the positive criticism of AI but still liked to interact with their teachers to gain more depth in concepts.

Illustrative Quote

"AI is a good tool for support, but it will never substitute human teachers. The nature of teaching goes way beyond algorithms." (Faculty, Public University)

Theme 5: Future Challenges of AI in Education

Q9: What are the primary challenges for institutions in AI adoption?

Q10: How can higher education better integrate AI?

Findings

- The greatest challenges to successful AI adoption were determined to be institutional preparedness and faculty training.
- Respondents identified the necessity of regular faculty development programs and better AI governance policies.
- EdTech experts suggested that universities, policymakers, and AI developers collaborate to advocate ethical and responsible usage of AI.

Illustrative Quote

"Without proper faculty training, AI implementation will remain underutilized and misinterpreted in many academic settings." (Faculty, Private University)

Summary of Qualitative Insights

The knowledge obtained from interviewing the people really is filling in some gaps in the survey data, highlighting the potential of AI to be a transformative force in education as well as introducing some significant concerns around ethics, accessibility, and readiness to adopt these changes. All parties present concurred that AI should exist as an assistive tool, rather than a replacement for legacy teaching methods. Major concerns of the future of AI in schools are providing equitable access, integrating it ethically, and providing sufficient training to the faculty.

Discussion

The results from both the survey and the structured interviews offer valuable perspectives on AI's role in education, especially regarding personalization, equity, ethical considerations, the effects on educators, and the challenges that lie ahead. This discussion weaves together both the quantitative and qualitative findings to give a well-rounded view of how AI is shaping higher education.

AI-Driven Personalization

The study found broad consensus that AI highly facilitates personalized learning. A survey result revealed that most people believed that AI applications are doing a great job in adapting content to suit the specific learning needs of every student, offering immediate feedback, and more effectively engaging students. The average AI personalization score was 4.12, and this reflected overwhelmingly positive sentiment for the way that AI works to develop personalized learning experiences.

These findings were validated by polls, and learners attributed achievement to AI suggestions and to the quality of AI seeing where learners aren't entirely mastering. However, some students indicated that sometimes AI personalization could be intrusive and too confining to limit diverse forms of learning from happening. Staff brought out how AI needs to augment, but by no means replicate, normal learning protocols. These insights align with previous studies (Luckin, 2021; Woolf, 2020), which highlight AI's potential in personalizing education while also cautioning against becoming too dependent on automation.

Accessibility & Equity

Regarding the impact of AI on educational access, the findings were conflicting. With a mean score of 3.80, the poll findings showed a moderate consensus that AI improves learning chances for underrepresented pupils. The respondents agreed that AI plays a part in remote learning, helping students with disabilities, and translating languages. Even Nevertheless, there were still problems with AI-based products' accessibility and affordability, especially for pupils in underprivileged environments.

These worries were expressed in the interview responses, as public university employees emphasized the disparities in AI adoption brought on by a lack of funding. To close the digital divide, edtech specialists emphasized the necessity of institutional and governmental policy measures. These outcomes are in line with research by Williamson and Eynon (2020), which suggests that depending on how AI is applied and made available, it may either help or worsen the digital divide.

Ethical Concerns in AI Integration

One of the participants' main areas of interest has emerged to be ethical issues. The findings indicated that the top concerns in terms of ethics were data privacy, algorithmic bias, and transparency, with a mean rating of 3.75. A number of participants voiced concerns that, if not rigorously supervised, AI-driven decision-making could worsen biases. The interviews revealed that educators and EdTech specialists prioritized strong data protection laws and transparent AI algorithms. Some participants voiced worries about student data usage, pointing to the necessity of more institutional oversight. The findings align with recent research (Aoun, 2018), which emphasizes the importance of ethical AI management in educational settings.

AI's Impact on Educators

One important topic of concern has been how AI will affect education. With an average score of 4.05, the survey results demonstrated a generally positive attitude. The majority of faculty members realized that AI helps them by automating grading, offering student performance analysis, and helping to provide information, so lowering their workload. Concerns were also raised about AI taking the place of human educators.

The interviews confirmed this perception, with teachers concurring that AI must remain a facilitative tool and not replace human pedagogy. Students expressed the desire to have AI-provided feedback but emphasized the need for human interaction in the development of critical thinking and imagination. These findings are consistent with previous research (Selwyn, 2019), which highlights the necessity for maintaining the human factor in education with the help of AI.

Future Challenges of AI in Education

Both the interview and survey outcomes provide data about institutional barriers that are in the way of AI adoption. The survey gave a mean score of 3.85, and through the same, the most important challenges were perceived as infrastructure, faculty development, and policy infrastructure. Most of the institutions quite simply don't possess resources necessary to bring in AI in the first place, which causes variations in its implementation.

In order to make the integration of AI easier, the participants emphasized the necessity of thorough and effective faculty development programs in addition to more precise regulatory guidelines. To promote fair and responsible use of AI, EdTech experts suggested cooperation between legislators, academic institutions, and AI developers. All of these recommendations, which emphasize preparedness and establish ethics-driven AI standards in the tertiary education sector, are consistent with earlier research (Holmes et al., 2022).

Summary of Discussion

These two results demonstrate AI's enormous potential to improve instruction, expand access, and personalize learning. However, we need to get over institutional obstacles, access disparities, and ethical issues in order to realize this promise. Faculty development

must be strong, AI policy must be open, and technology planning must be inclusive in order to guarantee the equitable and moral application of AI in education.

Conclusion and Recommendations

Summary of Findings

With a focus on five main areas—individualized learning, accessibility and equity, ethical considerations, the effect on instructors, and future challenges—this study examined in detail how artificial intelligence (AI) is changing education. The results showed that by customizing content to meet each student's unique needs and offering immediate feedback, AI can actually improve individualized learning. But there were also concerns about algorithmic bias and an excessive dependence on AI for learning.

Even while AI might help close educational inequalities by giving underprivileged students greater access to school, there are still technological and financial barriers that will prevent equitable access. Concerns about human ethics, including data privacy, algorithm fairness, and transparency, have become important issues that require institutions to pay close attention. Although they acknowledged that AI may increase teaching efficiency, most teachers saw it as a helpful ally who should enhance and supplement the human element in the classroom. Lastly, it was determined that the main obstacles to successfully integrating AI into education were issues like teacher training, building the necessary infrastructure, and developing efficient regulations.

Recommendations

These two results demonstrate AI's enormous potential to improve instruction, expand access, and personalize learning. However, we need to get over institutional obstacles, access disparities, and ethical issues in order to realize this promise. Faculty development must be strong, AI policy must be open, and technology planning must be inclusive in order to guarantee the equitable and moral application of AI in education.

Based on findings, the following are recommendations to ensure that AI is used in education responsibly and effectively:

- Teachers and AI programmers should work together to create AI-based learning platforms that not only individualize the learning process but also enhance the creative and critical thinking skills of the students.

- Educational institutions and the government must invest in the infrastructure and policies required to ensure that all students, particularly disadvantaged ones, have access to AI-enhanced learning.

Suggestions for Further Studies

- A critical examination into how performance by students at school, thinking skills, and flexibility are influenced in the long term as a result of AI-based learning.

- A discussion of how AI transforms conventional teacher-student relationships and with what impact on student motivation and engagement.

- An analysis of the way AI assists students with disabilities and other learning needs to guarantee that all have equal access to learning.

- Comparison of global policy and international best practice on the rollout of higher education ethical AI.

- Assessment of whether education that integrates AI actually prepares students for the labor market and industry demands within the next couple of years.

References

Aoun, S. M., Breen, L. J., White, I., Rumbold, B., & Kellehear, A. (2018). What sources of bereavement support are perceived helpful by bereaved people and why? Empirical evidence for the compassionate communities approach. *Palliative medicine*, *32*(8), 1378-1388.

Aoun, S. M., Breen, L. J., White, I., Rumbold, B., & Kellehear, A. (2018). What sources of bereavement support are perceived helpful by bereaved people and why? Empirical evidence for the compassionate communities approach. *Palliative medicine*, *32*(8), 1378-1388.

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European journal of education*, *57*(4), 542-570.

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European journal of education*, *57*(4), 542-570.

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European journal of education*, *57*(4), 542-570.

Luckin, R., Cukurova, M., Kent, C., & Du Boulay, B. (2022). Empowering educators to be AI-ready. *Computers and Education: Artificial Intelligence*, *3*, 100076.

Luckin, R., Cukurova, M., Kent, C., & Du Boulay, B. (2022). Empowering educators to be AI-ready. *Computers and Education: Artificial Intelligence*, *3*, 100076.

Roll, G. R., Lunow-Luke, T., Braun, H. J., Buenaventura, O., Mallari, M., Stock, P. G., & Rajalingam, R. (2021). COVID-19 does not impact HLA antibody profile in a series of waitlisted renal transplant candidates. *Human Immunology*, *82*(8), 568-573.

Selwyn, N. (2019). What's the problem with learning analytics?. *Journal of Learning Analytics*, *6*(3), 11-19.

Veletsianos, G., & Houlden, S. (2020). Radical flexibility and relationality as responses to education in times of crisis. *Postdigital Science and Education*, *2*(3), 849-862.

Wallet, P. (2015). The UNESCO Institute for Statistics (UIS) strategy on teacher statistics: developing effective measures of quantity and quality in education. In *Promoting and sustaining a quality teacher workforce* (pp. 39-85). Emerald Group Publishing Limited.

Williamson, B., Eynon, R., & Potter, J. (2020). Pandemic politics, pedagogies and practices: digital technologies and distance education during the coronavirus emergency. *Learning, media and technology*, *45*(2), 107-114.

Williamson, B., Eynon, R., & Potter, J. (2020). Pandemic politics, pedagogies and practices: digital technologies and distance education during the coronavirus emergency. *Learning, media and technology*, *45*(2), 107-114.

Williamson, B., Eynon, R., & Potter, J. (2020). Pandemic politics, pedagogies and practices: digital technologies and distance education during the coronavirus emergency. *Learning, media and technology*, *45*(2), 107-114.

Woolf, S. H., Chapman, D. A., Sabo, R. T., Weinberger, D. M., & Hill, L. (2020). Excess deaths from COVID-19 and other causes, March-April 2020. *Jama*, *324*(5), 510-513.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators?. *International journal of educational technology in higher education*, *16*(1), 1-27.