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Examining the Ethical Concerns of AI Applications in Education and Public Acceptability

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ABSTRACT

The study focused on the ethical concerns about AI in education and social acceptability. The research context was also set in the rapid adoption of AI solutions (adaptive learning systems, machine grading or chatbots) whose effectiveness and personalization benefits were paradoxically at the epicenter or ethical critical challenges related to data privacy biases and transparency and cadre shifts. A quantitative research design was employed, in which data were collected from 470 respondents representing various stakeholder groups using a structured questionnaire. A total of 410 valid questionnaires were analyzed. It was centered on fundamental questions/considerations, like data privacy, algorithmic bias, transparency, the replacement of teachers and influence on student creativity/fostering critical thinking; accompanied with perceived benefits such as efficiency, personalized learning and lowering the burden from teachers. The additional statistical analysis revealed that privacy, fairness and transparency were the most influential factors of trust and public acceptability of AI in education, while perceived benefits had positive impacts on acceptance, provided that there were clear regulatory frameworks. The findings proposed that despite the general public positivity about AI game-changing educational potentials, trust and socially beneficial deployment warranting the presence of ethical safeguard measures, be accompanied by well-informed regulatory frameworks and transparent mechanisms. This research provides practical implications on how ethical concerns may impact public opinion and policy recommendation about the proper use of AI in education.

INTRODUCTION

AI had been considered the most disruptive of twenty-first century technologies, and it was being embraced at pace in education (Dulundu 2024). Increasingly, AI-powered tools are being used in the classroom and on online personalized learning platforms, including automatic grading systems, intelligent tutoring systems, plagiarism detection programs, and virtual teaching assistants (K *et al.,* 2025). These were technologies that had been developed to increase efficiency, customise learning journeys, reduce the burden on teachers and improve access to quality education (Monika Singh *et al.,* 2025). The rapid adoption of AI in education paralleled ones that had taken place elsewhere globally towards technological disruption, but also raised serious ethical concerns around equity, liability, and social acceptability (Rismani & Köprülü, 2025). Although the effects of AI in education are well known for providing improved learning results, personalized support to learners and efficient resource allocation some serious ethical issues have raised (Venkat Narayana Rao *et al.,* 2025). Still, concerns about the privacy implications surrounding these data were quite evident as AI systems sucked in whole lot of student information, and oftentimes without a lot transparency or any consent (Torrisi-Steele & Torrisi-Steele, 2025). Also the concern of algorithmic bias in grading and decision making algorithms posed challenges to educational fairness and equity (Praveenkumar *et al.,* 2025). There have also been concerns that expanding AI use might lead to limited human engagement with learning and may make teachers fewer effective facilitators of critical thinking (Karamuk & Karamuk, 2025). A lack of transparency on what AI algorithms did and why they did so, additionally contributed to a spread of distrust : it was very hard for the involved parties to understand the making of those automated decisions (Özkaynar *et al.,* 2025). So public perceptions of the acceptability of AI in education now depended not only on 'how good it [was] at what it was suppos'd to be doing' but also how much those who might benefit from employing these new technology had trust that they would be used properly and nurtured carefully (Karran *et al.,* 2024). The public readiness to adopt AI functionalities for teachers, students, parents and the general public was highly associated with their trust in data security, fairness and accountability tools. Previous studies have found that adoption of new technologies are swayed not only by perceived usefulness, but may also be influenced by risk aversion to ethical risks compared with benefits (Halimuzzaman *et al.,* 2024). Rather investigation of any ethical issues and societal acceptability is essential, here to allow informed analysis of how AI might actually end up becoming embedded in education systems, on a

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sustainable basis.

In this regard, the present study aimed to investigate the ethical implications of AI implementation in Education and its influence on public acceptance. Taking a positivist research approach and multiple survey data sources, AMTM aimed to test which dimensions of ethics had an effect on trust in AI systems and their acceptance (and when) during implementation. The study also aimed to demonstrate trade-off between positive AI outcomes (e.g., personalization and efficiency) versus ethical risks which affected public perceptions. By offering recommendations on how the regulatory system, the ethical guidelines and public understanding could be improved in order to ethically embed AI in education. These results have implications for the academic debate and policy determination.

LITERATURE REVIEW

The emergence of AI technologies in education is increasingly becoming recognized as a disruptive power that modifies traditional pedagogies, and even offers novel opportunities for students' engagement and enhanced institutional effectiveness (Marmoah *et al.,* 2024). The use of AI-powered products and services (viz., adaptive learning platforms, automated essay scoring systems, predictive analytic tools, and intelligent tutoring system) had already been implemented in developed and developing countries (Avcı *et al.,* 2025). Studdard (2016) evidence the impact of such apps on resource efficacy and a customized experience for students, while reducing teaching admin. However, for all the rapid progress of AI in education, and in other sectors where it could be deployed, researchers agreed that the scale-up of development would inevitably face broader ethical challenges most prominently those related to privacy as well as fairness and accountability (Gaur *et al.,* 2024). In fact, research in educational technology had for quite some time been promoting the benefits of AI systems. For instance, (Chakkaravarthy *et al.,* 2025) AI-based personalized learning to customize pedagogical content that matches the individual needs of learners. Similarly, there had been a proof to the reduction in work load due to automated grading system for teachers to give more time toward student-centered learning activities (Langove & Khan, 2024). Furthermore, predictive analytics enabled institutions to be more proactive about identifying students who were at risk early in the cycle, so that interventions could take place and attrition could potentially be reduced. This was believed to have been the benefit of AI in improving education efficiency and inclusiveness (Taiwo & Busari, 2025). Yet the evidence presented for publication indicated that apart from these advantages, stakeholders were reluctant due to moral concerns. AI and educational ethics have already attracted some academic attention. The data privacy issue was one of the top concerns as AI programs would involve a large volume of student demographics, learning habits and performance reports etc. (Bhuiyan *et al.,* 2025). (Hossen *et al.,* 2025) also argued that collection and retention of sensitive, person specific information is prone to surveillance, misuse and unauthorized access. There was also concern about algorithmic bias that may replicate social injustices because of biased datasets from which AI systems derived information (Gonzalez-Argote *et al.,* 2025). 4) This problem was amplified in online modes of te sting, where biased algorithm might lead to unfair test conditions which could very well bias disadvantaged learners (Jain & Menon, 2023). In addition, in the field of ethics robotic teacher replacement issue began to surface and some scholars suggested that excessive reliance on AI would work against building rapport between teachers and students resulting decrease of creativity as well as critical thinking (Pahuja *et al.,* 2024). Transparency was also identified as a recurring theme owing to the "black box" nature of AI decision making that stakeholders could not easily see into or question (MoDastoni, 2023). It was identified in the literature that ethics had a strong impact on public acceptance of AI systems for education. Trust was another significant predictor of adoption, as the potential user will be more likely to accept the AI based systems if they perceive these systems fair, transparent and empowering (Ramanda *et al.,* 2025). Indeed, in a study by (Karran *et al.,* 2024) which was found to explore scenarios public perceptions of AI in education that also related both the perceived benefits and ethical concerns in relation with it to people's perception about trust within the mediating process. For instance, AI interventions that enabled personalized learning were embraced by parents and teachers whereas those that were considererd invasive or overrode human judgment were rejected (H. Bowle & Gaza, 2025). Moreover, a study found that AI literacy and digital awareness also drive the level of cautionary sentiment among the general public, as it was revealed that higher-knowledge citizens on AI express high concern on the ethical side of AI while still favoring it if proper measures are in place (Halimuzzaman & Sharma, 2024). The narrative review, we mentioned early in this post that both problems and opportunities can be associated with AI for education, therefore it was necessary to complement the recommendations given with some of its finding-based analysis.Xiao *et al.,* 2025. Privacy, Algorithmic bias, transparency and human displacement got the most heat. Frameworks of governance models and ethical principles were recommended but needed further evidence validation (Md Sharfuddin *et al.,* 2025). The paper aimed to fill this void by quantitatively investigating the weight of ethical considerations on public acceptance of AI in education, thereby generating a fresh insight for academic reflexion and policy guidance.

While many works focused on the advantages of AI for education or on its troubling ethical dimensions, few empirical studies investigated head-on the connection between ethics concerns and public acceptability. The vast majority of studies on this topic were either conceptual, or theoretical; as a result, normative claims were made in the absence of statistical data. Furthermore, most

of the past research was concentrated on teachers' or policymakers' perspectives, and multiple stakeholders perspectives such as students and public opinions still remain to be analyzed. This void suggested there was an appetite for empirical research that focused on how privacy, bias transparency and replacement by teachers impacted trust and acceptability of AI in the educational domain. The objectives of the study are:

1. To explore the awareness and experiences of stakeholders about utilization of AI applications in education.
2. To study the AI ethical issues in education regarding data privacy, algorithmic bias, and transparency and teacher removal.
3. To examine the perceived benefits of AI, in particular to personalizing learning and diminishing teacher workload.
4. To examine the impact of ethical considerations on trust and public acceptability with regard to AI in education.
5. To assess what role regulatory and ethical frameworks may have on improving public trust to ensure responsible AI adoption in the classroom.

METHODS AND METHODOLOGY

The research was quantitative in nature and included a structured survey to investigate the ethical issues related to AI tools in education, and their effect on public adoption. The sample population was composed of students, teachers, educational authorities and the general public in various urban centers. Determined the sample size by means of Cochran's formula (Cochran, 1942):

$n=(Z^2.p.(1-p))/E^2$

Where Z= 1.96 for a 95% confidence level, p= 0.5 assuming maximum variability and E=0.05 margin of error (Cochran, 1942). The calculated minimum required sample according to the formula was 384 subjects. In order to enhance validity and attain adequate representation a total of 500 questionnaires were mailed with the return responses therefrom being 470. Based on data cleaning and excluding incomplete questionnaires, a total of 410 questionnaires were analyzed. Investigate the relation between ethical considerations, perceived benefits, trust and public acceptability of AI in education. Descriptive and inferential statistical methods were applied to analyze the data.

RESULT AND DISCUSSION

Results are described accordingly to the main topics of the questionary: awareness and experience with AI app in education, ethical consideration, expected benefits, trust and public acceptance. Some said that they were already actively working with AI-based tools, while others described passive levels of engagement. Ethical concerns such as privacy problems, and bias in decision making were found to be the main triggers that have serious perception conveyance. Meanwhile, the answers showed positive attitudes to benefits of AI including customised learning and reducing teacher workload. Determined whether to take AI in education as socially acceptable would be trust of AI system and regulation framework. The conversation thereby related this research to existing literature and demonstrated how the views and expectations of stakeholders influenced their willingness to adopt and support AI in education.

Demographic Information of the Respondents

The demographic summary of the respondents served as important background for interpreting the following results on ethics, trust and public acceptability towards AI in education.

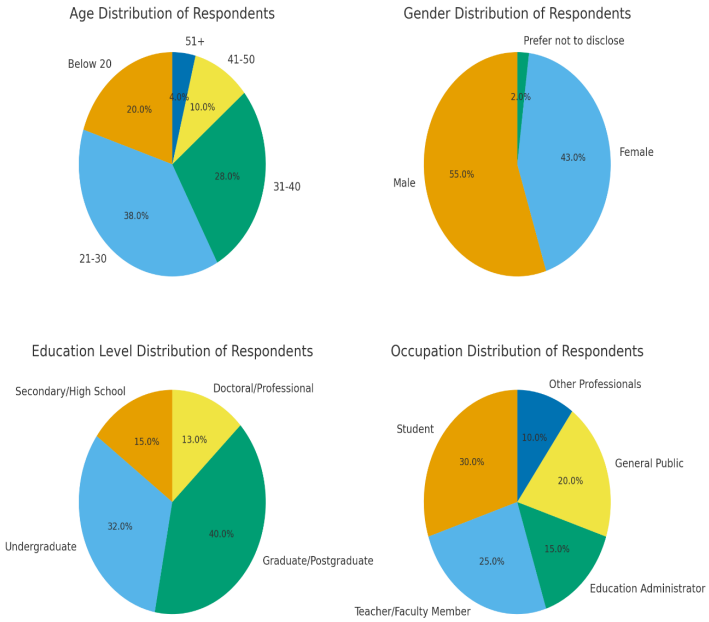

Figure 1: Demographic Information of the Respondents

In all, 470 questionnaires were received and there were 410 useful responses for this analysis. The respondents were of different age groups: about 38% were in the age group of 21–30 years, followed by those below the age of 20 years (20%), between ages 31–40 (28%), 41–50 (10%) and above the age of 51 years (4%) (figure 1). This distribution suggested that perhaps the sample would be biased towards young adults who were more exposed to digital and AI application technologies and this in turn might impact there perception of benefits as well as ethical risks. In terms of gender, 55% were male, 43% female and 2% did not want to specify their gender. This almost equal gender distribution indicates that insights were sufficiently captured from male as well as female perspectives, although the slight majority of males may reflect overall trends in school attendance and participation with other work related opportunities in the regions covered. In terms of educational level, the figures for undergraduate and graduate postgraduate training were 32% to 40%, respectively, compared with high school or secondary (15%) and doctoral or professional (13%). The over-representation of higher education students suggested the sample was knowledgeable and could have been expected to reflect on ethical concerns surrounding AI in education. They were also further along the education pipeline, where they are more likely to have an awareness of and sensitivity to issues like data privacy, algorithmic bias and transparency. The professional position of respondent was students (30%), staff and lecturer)"%, educational manager (15%), and lay people (20 %) themselves professionals in the system out postures. This distribution ensured that we received a fairly wide view from academia, industry and other stakeholders directly addressed or influenced by AI applications in education (Torrisi-Steele & Torrisi-Steele 2025). Thus, students were adopters of the AI tools; teachers and school principals as implementers and assessors; and there was input from society at large on acceptability/trust. On the whole, the demographic showed a slight tilt across age, gender and educational background categories as well as occupation distribution providing a rich ground for investigating perceptions about AI in education (Iqbal *et al.,* 2023). The sample was young and highly educated suggesting that the respondents were probably more technologically oriented, given to AI developments but also sensible to ethical issues associated with them. The socio-demographics were informative in relation to the other areas of the survey, particularly when making reference to differences between these groups in levels of awareness, confidence, ethical considerations and acceptance.

Awareness and Experience of AI Adoption in Education

Significant differences were found in the awareness of and experiences with AI in education across respondents.

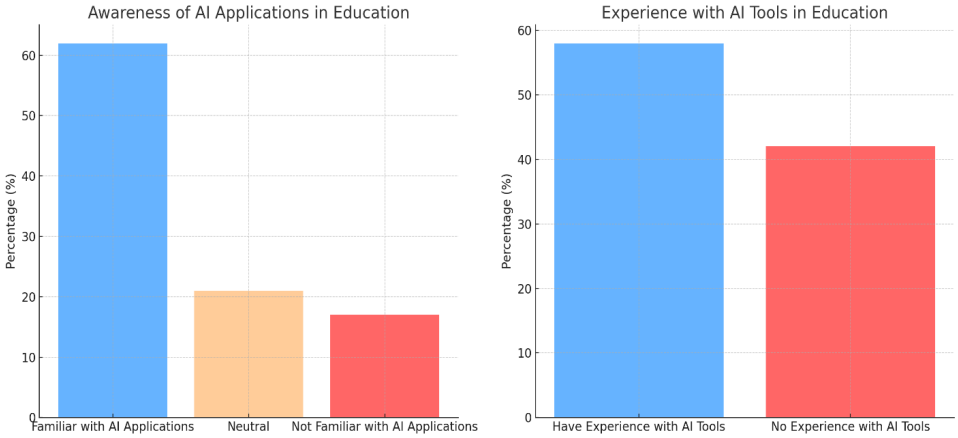

Figure 2: Awareness and Experience of AI Adoption in Education

As illustrated in Figure 2; when asked if they knew any AI technology would be applied to education, there were 62% of respondents liked or be familiar with AI tools as adaptive learning platform, automatic grading and plagiarism detection system chatbot. A large proportion (21%) were neutral, or did not know which, and close to an equal proportion (17%) disagreed or strongly disagreed with the statement indicating ignorance. It also illustrated the fact that although many respondents were very familiar with AiEd, there were still quite a number of them who had little exposure to it which reflects the uneven distribution of technology literacy among groups of users. Experience in practice A majority of the respondents (58 %) had firsthand experiences with AI based educational tools and interfaces, while the remaining 42 % did not. Among those who had used them, adaptive learning systems and plagiarism checkers were cited more frequently by students as common uses, and automated course grading systems and predictive analytics platforms were mentioned more by faculty members and administrators. This difference underscored the divergent access different stakeholders had to AIs in education dependent on their roles within the sector. These results were consistent with findings in the literature that familiarity and prior experience with technology played a significant role in perceptions

of risk/ benefit (Langove & Khan, 2024). The latter the view that AI does more harm than good, even among people who have themselves used it was a rarer and comparatively finer point of opinion among direct users, who reported enjoying added personalization and efficiency while providing warnings about potential issues on data privacy and transparency. In contrast, graduates who did not have some kind of prior exposure often replied they distrusted (or had questions) but could not consider how ethical considerations would apply to AIED. The analysis of these data revealed that awareness and use had a significant influence on attitudes toward AI in education. Familiar participants could identify more benefits and know when to worry from an ethical point of view, even as the unfamiliar were confused or resistant. They emphasized the importance of increased public education and field outreach for these types of AI technologies, especially among certain stakeholders that had zero or limited direct experience. Increasing technological literacy therefore became an important avenue for achieving informed trust and broader social acceptance for AI as part of education.

Ethical Concerns of AI in Education

Analysis of ethical concerns some participants had strong negative feelings towards the use of AI in education.

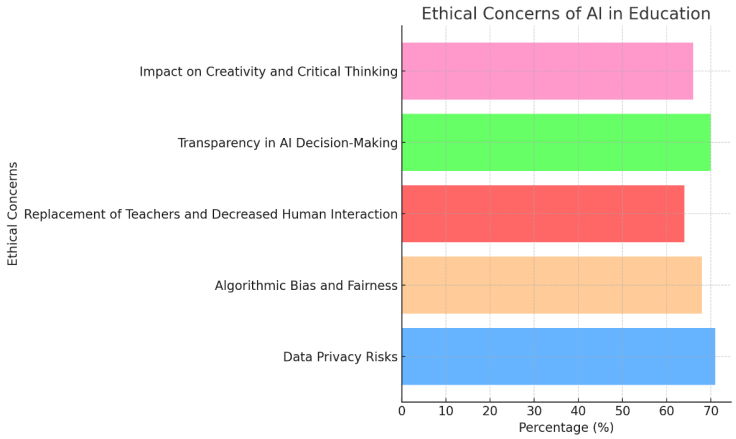

Figure 3: Ethical Concerns of AI in Education

As shown in Figure 3, most of the respondents agreed or strongly agreed (71%) that AI applications carried high data privacy risks because the systems relied substantially on aggregating and maintaining personal student information. Agreed Only 12% disagreed and 17% did not agree or disagree. This worry reflected common concerns regarding how student-generated data might be misused, mismanaged or accessed without consent and was consistent with claims in the earlier literature that identified data privacy as one of the central ethical considerations of AI use (Rismani & Köprülü, 2025). Algorithmic bias and fairness also became widely recognized as major issues. About 68% said grading or assessment based on AI was likely to produce biased or unfair outcomes if algorithms were not developed using broad, representative data. This discovery corroborated literature concerns that algorithmic decision making might perpetuate the current disparities, especially among disadvantaged people (Praveenkumar *et al.,* 2025). Several respondents highlighted that students can be discriminated by AI systems, if not properly monitored or human-in-the-loop. There were also concerns about replacing teachers and reducing human contact, 64% of respondents thought that reliance on AI might damage the traditional teacher-student relationship. The teachers singled out in particular the reality that while AI may be useful to our teachers for administration and menial tasks, it would never replace what gave students critical thinking abilities and creativity… Their hearts, commitment, motivation, encouragement and coaching. This was consistent with (Gaur *et al.,* 2024) who stated that an over reliance of AI could easily lead to dehumanizing the learning process, and possibly also depersonalize the environment. Another cause of concern was transparency in AI based decision-making. The lack of transparency in how those systems were producing results or making decisions had at least somewhat fueled the trust building problem, some 70% agreed. Respondents emphasized that such A.I. tools were "black boxes," and users could not question, check or push back against their output. This finding supports (H. Bowle & Gaza, 2025) claim that opaque AI was creating moral tensions resulting from inhibiting accountability and constraining users' trust the technology. Finally, two-thirds (66%) were worried that overreliance on AIs could stifle students' creativity and critical thinking skills as AI-powered learning tools may prompt passive rather than active learning. Commenters noted that while AI would allow for a more personalized content regimen, it would never stand in place of the intellectual curiosity and creativity developed from human interaction and problem solving. Taken together, these findings suggested that ethical concerns were most salient in influencing stakeholder attitudes towards AI support in learning. And while participants stated they expect AI

to advance efficiency and personalization, their answers highlighted concerns over threats posed to privacy, equity, transparency, and the continued existence of human-based teaching jobs. The conversation highlighted that, without these issues being properly addressed by an inflexible ethical code and tight regulatory safety-nets, the public adoption of AI in education would be limited.

Perceived Benefits and Risk

Three key statements were applied in the study for perceived benefits and risks of AI in education: that AI can personalize learning, increase efficiency and workload reduction for teachers, and had potential misuse or unethical use.

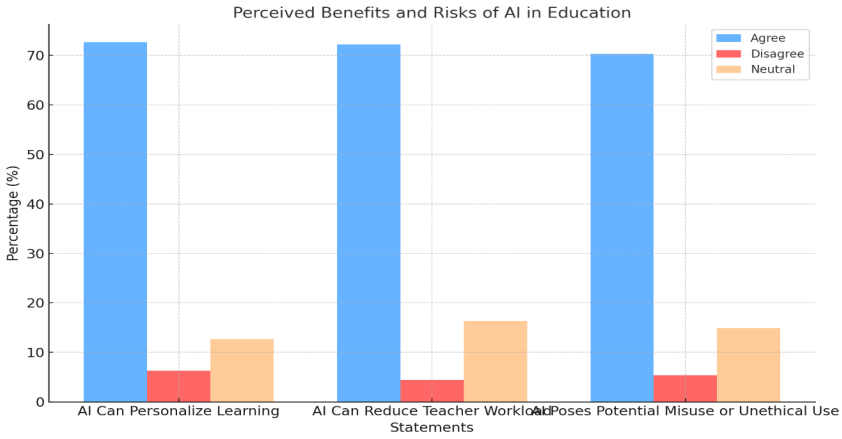

Figure 4: Perceived Benefits and Risk of Adopting AI in Education

Figure 4 shows that, among 410 participants, 26 (6.3%) strongly disagreed with it, 34 (8.3%) disagreed, 52 (12.7%) neither agreed nor disagreed and it was selected as the correct answer by in majority of participants; 178(43.4%) were agree whereas strong agreement rate was highest: 120(29.3%). Overall, 72.7% of the participants perceived AI to be capable of successfully personalizing learning. It suggested widespread backing for the idea that AI might be able to personalize learning materials according to what each learner most needs, and deliver customized feedback. These results validated previous assertions that AI's Adaptive Learning intervention does in fact contribute towards the accessibility and responsiveness of education (Jain & Menon, 2023). The low number of participants who disagreed or were neutral highlighted the need for additional buy-in and pragmatic implementations that demonstrated AI's capabilities in real settings would be necessary. There was higher numbers of than 18 (4.4%) strongly disagree, 29(7.1%) disagree, 67(16.3%) neutral position, 176 (42.9%) agree and 120(29.3%). Altogether, 72.2 per cent of respondents said that AI would allow teachers to better manage their workload. Both teachers and administrators knew that AI could be useful in automating administrative processes like grading, attendance and resource management. The higher level of neutral responses (16.3%) hinted at the possibility that some stakeholders were unsure whether or not these efficiencies would result directly in reduced workload, and not just shift somewhere else. This observation was in line with earlier research that highlighted the ways AI might enhance educator roles, rather than replace them, freeing up educators to concentrate on creative and mentoring elements of teaching (H. Bowle & Gaza, 2025). In response, 22 (5.4%) strongly disagreed; 39 (9.5%) disagreed; 61 (14.9%) neither agreed nor disagreed 166 (40.5%), and 122 (29.8%) strongly agreed with the statements respectively. In total, 70.3% of respondents thought that AI posed potential misuse or unethical use. Participants' concerns focused on data protection, bias in algorithms, surveillance and the overuse of automated decision-making. Agreement with this statement was further reinforced, indicating an increasing recognition of ethical issues surrounding the integration of AI in education. These were also supported by the current debates around fairness, transparency and trust threatened by AI in education systems in absence of regulatory safety net (Pahuja *et al.,* 2024). The slight minority who didn't believe so (14.9%) could have simply been hopeful, or relying on governing AI to responsible institutional systems. In general, it appears that respondents harbored mixed feelings about AI in education - on one hand they strongly favored the advantages of personalized and efficient learning whilst also being mindful of ethical implications. The results were bivalent and should be seen as the expression of ambivalence toward AI integration in education. AI was found to be a qualified rather than unqualified public support where the viability of the latter requited significant risk mitigation in terms of ethics, transparency and strong governance. These lessons suggested that technical innovation would not be sufficient, and frameworks of trust and responsibility would be required in order for AI to be successfully integrated into education.

Trust and Public Acceptability

This phase of work aimed at understanding the level

of trust toward AI application in education and respondents' overall acceptance of adopting it within teaching and learning systems. These perceptions were assessed with three Items: Participants perceived trust in decisions issued by AI in education; Belief that AI is seen as an effective educational tool, and Agreement that transparency and accountability are key elements of public trust.

Figure 5 indicates that out of 410 respondents, 30 (7.3%) respondents strongly disagreed, and then there were 42 (10.2%) who disagreed; while others neither agreed nor disagreed were obtained from 81 (19.8%); on the other hand agreeing answers were received from another160 (40.7%), some who strongly agreed among which was the count of 90 few participants (22.0%). In total it was 62.7% who trust AI in decisions, almost 17.5% who

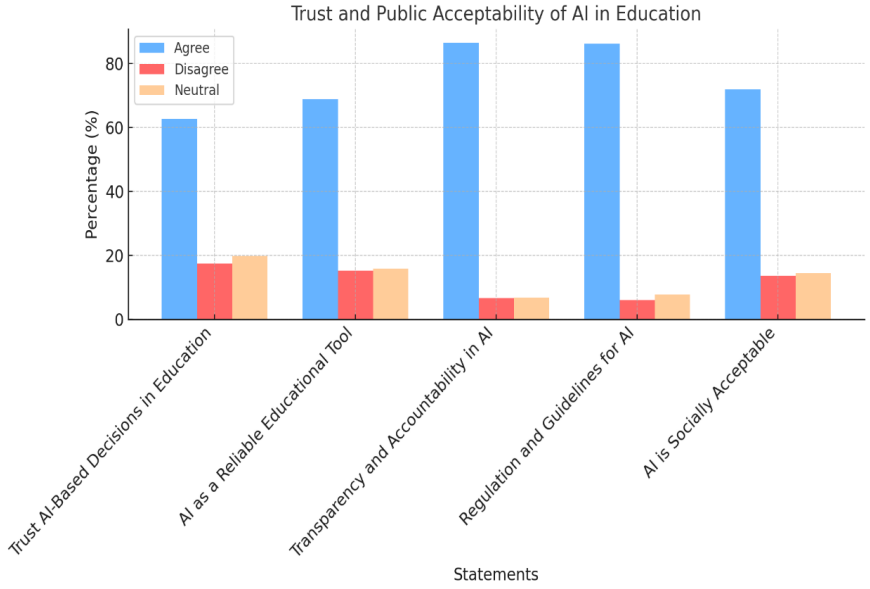

Figure 5: Trust and Public Acceptability of AI in Education

expressed at least if they didn't exactly distrust then a lack of trust and nearly 19.8% were undecided. American employees, the study suggests, sided strongly with their European counterparts in how much they trust smart automation on the job. These data suggested that AI could only be partially trusted by the majority of people and eyed it with a great deal of caution, even neutrality. Cross-post This lack of confidence may correlate with a lack of exposure to AI in school or concerns about the fairness and accuracy of AI algorithms. They were 24 (5.9%) strongly against,38(9.3%) against,65 ((15.9)% neutral and 180(43.9) in for change and they were 103 (25.1) strong in favour of the proposal. Overall, 69.0% of the respondents approved AI as an effective educational tool representing significant approval for majority attitude. The moderate fraction of disagreement (15.2%) suggested a relatively small amount of people are not convinced that AI trustworthy, and the neutral group (15.9%) may have left room for some uncertain population to become more informed and experienced with real use evidence view it as convincing later on. The findings supported prior research, which suggested that the acceptability of AIs was significantly mediated by evidence of reliability and perceived usefulness (Avcı *et al.,* 2025).

FINDINGS

• Functionality and experience at AI in education were surprisingly high according to our study; however, a not neglectable number had no knowledge nor experience but other participants did.

• Respondents identified clear ethical concerns around the use of AI, in particular related to privacy, bias and transparency and also job displacement of human educators.

• The survey respondents demonstrated widespread awareness of both the promise that A.I. can deliver like personalization and efficiency as well as risks that it could be abused and widen inequality.

• It discovered that the AI sentiment in education was provisional, had its base on transparency, accountability and strict regulatory system.

• The study confirmed that the majority of respondents believes it is socially acceptable to utilize AI in education on the proviso of ethical considerations and governance mechanisms.

RECOMMENDATIONS

• Education institutions should carry out extensive programmed of public awareness to create a climate among stakeholders for artificial intelligence in education.

• Policy-makers and administrators will need to create the ethical framework to deal with concerns such as privacy, bias in algorithms, transparency and maintaining a role of teachers.

• AI researchers and academia must place more focus on tools that support more personalization and efficacy

while also reducing risks of misuse or inequality.

• Apply strict laws and accountability to be assured that AI is used wisely during the learning.

• AI systems should be systematically monitored and assessed for their social acceptability, to assess the ethical impact of such technology and to address proactively stakeholders' concerns.

CONCLUSION

The study examined ethical dimensions of AI use in education, and outcomes on social values were related to public acceptance, showing that although respondents themselves could see very well the perceived benefits (e.g. personalization and effectiveness in AI solutions), they also worry about risks such as for example data privacy violations, biased algorithms or experiences disturbed by automated systems or even replaced teachers. The findings indicated that familiarity and experience with AI played an influential part in determining the trustworthiness of a technology as well as its social acceptance, conditional on stringent ethical guidelines being followed, transparency practices and regulatory documentation. In sum, the study indicated that AI was neither an inevitable blessing nor an inescapable curse for education: that it presented a dual possibility for transformative change only by being responsibly governed, involving all participants and by protecting its ethical landscape. The findings drew attention to the need for colleges and universities, policymakers, and developers to collaborate in ensuring that integration of AI aligns with end goals on ethical values, stakeholders' protection and rights as well as trust building so that it can be used with socially desirable outcomes efficiently in education.

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