

Ethical Management of Artificial Intelligence in Special Education: Balancing Innovation and Inclusion

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ABSTRACT:

The rapid integration of artificial intelligence (AI) in education is reshaping teaching and learning practices worldwide, with significant implications for special education. In Pakistan, where inclusive education is an emerging priority, AI offers promising opportunities to enhance accessibility, personalized learning, and instructional support for students with disabilities. However, the ethical management of AI remains a critical concern, particularly in relation to equity, data privacy, transparency, and fairness. This study investigates the ethical management of AI in special education in Pakistan, focusing on balancing technological innovation with inclusive educational practices. A quantitative research design was employed, using a structured questionnaire administered to special education teachers and educational professionals. Data were analyzed through descriptive statistics, correlation matrix, and multiple regression analysis to examine relationships among AI integration, ethical AI management, teacher preparedness, and inclusive educational outcomes. The findings reveal a significant positive relationship between AI integration and inclusive educational practices. Regression analysis

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further indicates that ethical AI management and teacher preparedness significantly predict inclusive education. Despite these advantages, the results highlight major ethical challenges, including algorithmic bias, limited teacher digital literacy, data privacy risks, and unequal access to AI technologies in Pakistan's special education context. The study concludes that while AI has strong potential to improve learning opportunities for students with disabilities, its effectiveness depends on strong ethical governance, human oversight, and capacity building of educators. It recommends the development of national ethical AI frameworks, targeted teacher training programs, and equitable digital infrastructure to ensure responsible and inclusive AI implementation in Pakistan's special education system.

Keywords: Artificial Intelligence; Special Education; Pakistan; Ethical AI; Inclusive Education; Educational Technology; Teacher Preparedness; Data Privacy.

Introduction

Artificial Intelligence (AI) is undoubtedly among the most revolutionary technologies disrupting today's educational landscape globally. Machine learning, natural language processing, predictive analytics, and AI have revolutionized the creation, evaluation, and administration of educational content. In the field of education, AI technologies are being adopted more than ever to enhance teaching quality, personalize learning, and engage students in various learning environments. Over the past few years, AI has become a significant focus due to its ability to improve education accessibility and academic results, including intelligent tutoring systems, automated assessment tools, virtual assistants, speech-to-text systems, and adaptive learning platforms (Evmenova et al., 2024). Within special education, these technological advancements present important opportunities to address the complex and diverse learning needs of students with disabilities and learning difficulties.

Special education is about offering individual support, and fair education opportunities to children and young people with physical, intellectual, sensory, emotional and developmental disabilities. Traditional special education programs tend to demand a lot of time and human resources, along with a high degree of individualized teaching,

up-to-the-minute tracking, and specialized interventions to address students' unique needs. In the field of education, AI tools and technologies can provide innovative solutions that support inclusive learning by facilitating personalised learning, offering immediate feedback, adapting curriculum content, and creating easy-to-use communication approaches (Waterfield et al., 2024). Speech recognition systems can help students who have communication problems, for instance, and AI-powered predictive analytics can help teachers detect learning issues early on. Likewise, adaptive learning systems can adjust the content of instruction to the individual learner's cognitive capacity, learning style and pace, which can encourage greater academic engagement and independence for learners with disabilities.

The use of AI in special education is also closely connected with the worldwide trend of inclusive education. The international education system is placing a strong focus on equality of access to quality education for every learner, irrespective of their disability, socioeconomic background or cultural background, as is laid down in the United Nations Sustainable Development Goal 4 (SDG 4). It is hoped that AI technologies will help achieve these goals by making learning more accessible and overcoming learning barriers in educational contexts. AI-driven educational tools are seen as a way to promote inclusive education by providing

personalized learning experiences, enhancing student engagement, and aiding differentiated teaching in mainstream classrooms (Pagliara et al., 2024). Governments, educational institutions, and technology developers are hence investing in AI-based education systems to improve inclusive and accessible education more and more.

While the advantages of using AI in special education are substantial, the potential ethical, social, and pedagogical implications are significant and must be addressed. Algorithmic bias and discrimination is one of the most important issues. The functioning of AI systems relies on extensive amounts of data and algorithmic models to make predictions, recommendations, and educational decisions. AI systems, however, can produce inequitable results if they are not well designed to serve students with disabilities or culturally diverse students, which can exacerbate educational inequities (Rakap, 2024). Educational data frequently fail to include students with disabilities, which can lead to their misrepresentation, imprecise instructional recommendations and placement decisions. This algorithmic bias can have a negative impact on a student's educational opportunities, self-esteem, and overall educational experience. Thus, the issue of fairness and equity is a critical ethical concern in special education research and practice.

Data privacy and confidentiality is another important concern. Special education data is often sensitive, such as behavioral data, medical records, psychological evaluations, communication history, and Individualized Education Programs (IEPs). Special education data is often sensitive and can include information like behavior, medical records, psychological evaluations, communication patterns, and Individualized Education Programs (IEPs). The widespread adoption of student data has sparked ethical concerns about informed consent, privacy, data security, and risk of misuse of personal information (Gouseti et al., 2024). Parents and educators might be concerned about the privacy of educational data, its use by AI systems and how it is processed and shared with third-party technology providers. Vulnerable students may be subject to discrimination, stigmatisation or exploitation as a result of

unauthorised access or if there is a data breach. Thus, the key steps in ensuring ethical AI governance in special education involve establishing robust data protection measures, adopting transparent data management processes, and implementing rigorous accountability protocols to ensure the protection of student rights and privacy.

Beyond privacy issues, the growing use of AI technologies has sparked discussions about the importance of human touch and expertise in special education. Special education practices are solidly based in empathy, emotional understanding, social interaction and individual support. Teachers and special educators are key players in the process of assessing student emotional needs, modifying instructional practices, and establishing a relationship of trust with student and family. While AI systems can enhance efficiency and offer data-driven insights, they cannot be as empathetic, ethically aware, or contextually aware as humans (Goldman et al., 2024). Over-reliance on technology could decrease the autonomy of teachers, and the education could be too uniformed and neglect social and emotional needs. Thus, researchers highlight that AI should be used as an assistive technology and not as a replacement for teachers in special schools.

Transparency and explainability are also key ethical considerations in the use of AI. Some AI systems use sophisticated algorithms which can be difficult for teachers, students, and parents to comprehend. This lack of transparency may pose difficulties in comprehension of the generation of educational recommendations or decisions. Stakeholders in special education, where the results of assessment, intervention and placement can have a profound impact on lives, need to have the ability to question and critique the AI-generated outputs (Harkins-Brown et al., 2025). Ethical AI systems should thus be transparent in their decision-making, limitations and potential risks. Clear and open AI use can build trust between a teacher, parents, and students, as well as hold teachers accountable in their decision-making processes.

Additionally, a few educational systems continue to grapple with issues of access and equity to AI

technologies. While AI can contribute to inclusion, inequities in access to digital infrastructure, assistive technologies, Internet and teacher training can exacerbate existing education inequalities. In countries where schools are located in low-resource areas or financially constrained, this can result in a lack of technological sophistication, making it difficult to effectively implement advanced AI systems. This can result in unequal access to learning opportunities with the use of AI technologies for students with disabilities from disadvantaged socioeconomic backgrounds. These digital disparities demand that policies and school leaders take action on the issue of affordable, accessible and inclusive technological resources for all students, as required for ethical AI management (Pagliara et al., 2024).

The ethical usage of AI in special education also depends on the Digital Literacy and Preparedness of Teachers. Educators often don't have the expertise necessary to assess AI systems, understand algorithmic results, or recognize the potential ethical concerns of educational technologies. If teachers don't receive proper training, they could fall into the trap of relying too heavily on AI-backed suggestions or not be aware of algorithmic bias and errors. Researchers highlight the need to prepare teachers with digital skills and ethical sensibilities to promote the safe and responsible use of AI in inclusive learning settings (Evmenova et al., 2024). Continuous professional training can play a role in helping educators to strike a balance between technological innovations and pedagogical and ethical duties.

With these opportunities and challenges, it is important to have a balance and human-centered approach to the ethical use of AI in special education, one that is inclusive, fair, accountable and respectful of human rights. Schools need to create policies and frameworks for governance and ethical use of AI and promote the active participation of stakeholders such as teachers, students, parents, policymakers and disability groups. Ethical AI systems should be developed using the principles of Universal accessibility, Transparency, Non-discrimination, and Social responsibility. Furthermore, partnerships between schools and technology providers are vital to

ensuring that AI tools meet the needs of the varied students with disabilities and support inclusive educational purposes.

The goal of this research is to delve into the moral governance of AI within special education, highlighting the need to navigate technological advancements while ensuring education remains inclusive and equitable. In particular, this research examines the ethical aspects of integrating AI in terms of algorithmic fairness, privacy protection, accessibility, transparency, human oversight, inclusive governance. The purpose of this research is to shed light on the opportunities and challenges of implementing AI in special education, help inform the scholarly conversation and debates about responsible educational technology, and offer practical recommendations for special educators, technology developers, and policymakers. The study aims to foster ethical and inclusive use of AI that will enable students with disabilities and enhance equitable educational opportunities in the digital age.

Literature Review

Artificial Intelligence in Special Education

Artificial Intelligence (AI) is a game-changing technology in contemporary education, especially when it comes to Special Education where personalized learning and adaptable teaching methods are crucial. AI is the technology of computer systems that can carry out tasks that would typically be done by humans, such as learning, reasoning, speech recognition, decision making and problem-solving. In the field of education, AI is being used in various ways, including intelligent tutoring systems, adaptive learning platforms, speech-to-text tools, predictive analytics, and virtual assistants, to enhance teaching practices and student learning outcomes (Harkins-Brown et al., 2025). The researchers have also pointed out how AI can revolutionize special education by providing personalized support and inclusive learning spaces for learners with various needs.

In recent years, the literature shows that technology powered by Artificial Intelligence (AI) tools, in the field of education, can have a great

impact on students with disabilities. AI-based educational technology tools have been shown to have a significant effect on student learning experiences with disabilities through recent literature. Waterfield et al. (2024) report that uses of AI in special education support teachers in tracking pupil progress, creating personalized learning plans, and streamlining paperwork. Likewise, Evmenova et al. (2024) suggested that differential or personalized instruction can be facilitated with the help of generative AI technologies and the generation of personalized learning materials based on students' academic and cognitive levels. Additionally, AI-powered systems foster student independence, allowing individuals to access education more effectively, regardless of their communication or mobility challenges.

AI technologies are additionally believed to play a role in fostering inclusive education processes by creating chances for a more accessible learning environment for those with special educational needs. A scoping review by Pagliara et al. (2024) identified that there are communication, adaptive assessment, and collaborative learning support areas that could be enhanced with the use of AI-assisted tools in inclusive education. The authors highlighted the key role of AI applications in supporting and enhancing learning equity, offering the provision of customized support to students who need further help and support in education. These results are consistent with international education plans that call for equal and fair opportunities for education for all learners, including those with disabilities.

Ethical Concerns Related to AI in Special Education

While AI has tremendous potential to support special education, the literature highlights the following ethical concerns regarding the use of AI. Algorithmic bias and discrimination is one of the most common topics of discussion. AI systems depend on datasets and machine learning algorithms which can include social, cultural or institutional biases. AI-driven decisions can have unfair outcomes if the data sets are poorly designed for students with disabilities or for marginalized communities (Rakap, 2024). For

instance, an erroneous and biased prediction by a model of student learning may lead to an inaccurate evaluation of students' learning capacity or to the inappropriate provision of educational interventions, which in turn perpetuates educational disparities.

In their systematic review of AI ethics in K–12 education, Gouseti et al. (2024) noted that algorithmic bias can have an adverse impact on vulnerable learners by restricting access to fair and inclusive educational opportunities. The authors emphasized the need for continuous monitoring and fairness evaluation of learning AI systems to treat all students fairly. However, in special education settings where individual support is essential, biased technologies can negatively affect the support for inclusive education provision and impact student academic outcomes.

There is also a literature-based focus on privacy and data protection issues, which are also key ethical concerns. In the field of special education, AI tools frequently process extensive and private student data, such as records of behavioral patterns, medical history, cognitive evaluations, and Individualized Education Programs (IEPs). The inappropriate use or disclosure of these data could also potentially infringe upon students' privacy rights and raise concerns about surveillance and discrimination (Gouseti et al., 2024). In addition, parents and teachers might not understand how an AI system handles and retains their personal data, which can lead to questions about informed consent and transparency.

A further ethical challenge is the decrease of human engagement in the educational setting. While AI can enhance teaching efficiency and streamline repetitive work, excessive dependence on AI tools could reduce the human touch in special ed, as stated by Goldman et al. (2024). To be effective, a special educator must be emotionally understanding, empathetic, socially connected, and judicious in context, which are not easily replicable with automated systems. Hence, the scholars always emphasize the need to use AI in conjunction with teachers and special educators, but not instead of them.

Transparency and Accountability in AI Systems

The principles of transparency and accountability have become paramount in the field of ethical governance related to AI in education. Some AI systems are considered “black box” because the user might not be able to fully understand how the system reaches a decision or recommendation. Transparency is crucial in special education, where educational decisions can have a profound impact on the academic and social success of students, and can lead to misunderstandings and mistrust between educators, parents, and students (Harkins-Brown et al., 2025).

There is a need for explainable AI systems to deliver clear and comprehensible information on algorithmic processes and decision-making criteria, researchers say. The transparent AI systems can help educators assess suggestions and ensure they make choices that correspond to each student's specific needs. Notably, accountability mechanisms play a critical role in holding educational institutions and technology developers accountable for their use of AI in educational settings. Gouseti et al. (2024) suggest that schools must design ethical principles, rules and oversight to guide and monitor the use of AI responsibly.

Accessibility and Inclusive Educational Practices

Inclusion and accessibility have remained important issues in the literature of AI and inclusive education. Assistive technology, like text-to-speech software, visual recognition, language translation systems, and adaptive technology can be improved with the help of AI. These technologies have the potential to enhance communication and learning engagement for students with sensory, cognitive and physical disability (Pagliara et al., 2024); this could benefit students with sensory, cognitive, and physical disabilities.

But scientists also warn that these disparities in access to AI technologies could deepen the “digital divide” between students. Low-income schools or rural areas might not have the technology or infrastructure, internet access, and teacher support

to implement AI effectively. However, students of lower socioeconomic status might not be equally well served by AI-based innovations in education. Rakap (2024) highlighted the importance of equitable distribution of technology and support services for inclusive implementation of AI in education, ensuring access to all educational opportunities for students irrespective of their socioeconomic status.

Another key determinant to accessibility and inclusion is teacher preparedness. Digital literacy and professional training in the use of AI technologies are lacking in many teachers. Evmenova et al. (2024) proposed that teachers need continuous professional development to ensure that they can successfully incorporate these AI tools into inclusive classrooms while keeping ethical and pedagogical requirements in mind. Good teacher training can enhance teachers' competency in recognizing algorithmic bias, make them better at interpreting the data generated by AI, and respect students' rights in digital learning environments.

Human-Centered and Ethical AI Governance

Evidence in the literature is strong that human-centered AI governance models should be embraced in special education. Human centered AI actively supports the design of technologies that value human dignity, diversity, inclusion and ethical values. It is suggested that fairness, accessibility, transparency, accountability, and human oversight should be emphasized as principles to guide ethical governance of AI in education (Harkins-Brown et al., 2025). There is a consensus that the implementation of AI needs to be done in collaboration with educators, policy makers, parents, disability advocates, and technology developers, all of whom are key stakeholders in the process. They point out that involving stakeholders in the research process can help to uncover ethical issues, design the technology, and align the AI system with the actual needs of students with disabilities. Moreover, ethical governance frameworks should include policies related to data protection, algorithmic auditing, accessibility standards, and teacher

training to promote sustainable and inclusive AI integration in special education.

In summary, the current literature shows that AI has a promising potential in the field of special education, offering benefits in the areas of personalized learning, accessibility, and instructional support. Ethical issues such as bias, privacy, transparency, accountability and unequal access are significant challenges, however. Overall, the studies reviewed highlight the importance of a balanced and human-centred approach to AI governance that can foster inclusive and equitable education practices and not reinforce exclusion and inequity.

Hypothesis Development

This study has been built on a review of literature pertinent to the field of artificial intelligence (AI), ethical technology use and inclusive education, especially in the context of special education in Pakistan. Existing studies indicate that AI technologies can enhance personalized learning, accessibility, and teaching effectiveness for students with disabilities. They are, however, very reliant on ethical governance, preparedness of teachers and support systems in institutions. Theories and empirical results were used to formulate the following hypotheses.

AI Integration and Inclusive Educational Practices

Research studies have shown that the use of AI tools like adaptive learning systems, intelligent tutoring platforms, and assistive communication technologies can boost personalized learning and improve the educational results of learners with disabilities (Evmenova et al., 2024; Waterfield et al., 2024). These technologies help to implement differentiated instruction and remove learning obstacles, which helps to promote inclusion. In the context of Pakistan, where inclusive education systems are still in its infancy, AI is anticipated to assist in enhancing access and participation of learners with special needs.

Thus the following hypothesis is put forward:

H1: There is a significant positive relationship between AI integration and inclusive educational

practices in special education institutions in Pakistan.

Ethical AI Management and Inclusion

Algorithmic bias, transparency, and data privacy issues are among the many potential challenges associated with the use of AI in education that have been identified as ethics concerns. Research indicates that if not used with proper ethical principles, AI systems can exacerbate inequalities and have a negative impact on vulnerable learners (Rakap, 2024; Gouseti et al., 2024). Whereas fairness and individual support are central tenets of special education, ethical AI governance will be one of the most important factors in the success of special education's inclusion.

Consequently, the second hypothesis is put forward like this:

H2: Ethical AI management significantly predicts inclusive educational practices in special education institutions in Pakistan.

Teaching Experience and AI Effectiveness

Teachers' digital literacy, training and preparedness to adopt new technologies are crucial for the effective adoption of AI in education. The study findings underscore the importance of teacher training in effectively and responsibly using AI tools in the classroom (Evmenova et al., 2024). In the context of Pakistan, the availability of professional development opportunities could potentially affect the integration of AI in teaching methods. Professional development opportunities in Pakistan could potentially impact the effectiveness of teachers using AI-based teaching methods.

Therefore, it is suggested that the third hypothesis is:

H3: Teaching Experience significantly influences inclusive educational practices in AI-supported special education settings in Pakistan.

Human Oversight and Ethical Balance

It is clear from the literature and the research itself that AI should serve as an assistant, not a replacement for educators. In special education, where students need one-on-one emotional and

behavioral support, emotional intelligence and empathy are still crucial (Goldman et al., 2024). Thus, human oversight is likely to keep ethical and contextually appropriate AI-driven decisions.

This is based on the following ideas:

H4: Human oversight significantly enhances the effectiveness of AI integration in promoting inclusive educational practices in special education institutions in Pakistan.

Based on the above arguments, the study suggests that the factors that influence inclusive educational practices are multiple and are interrelated such as the use of AI, ethical use of AI, teacher readiness, and human oversight. All of these factors play a role in the success of the implementation of AI in special education.

Methodology

Research Design

This study used a quantitative descriptive-correlational research design to explore the ethical management of Artificial Intelligence (AI) in Special Education and the ethical aspects and the relationship between inclusive education Creswell & Creswell (2018). The quantitative approach was chosen as the method to collect measurable data that can be statistically analyzed to determine the relationships among the variables, as well as generalize the results to the educational setting.

The study sought to explore educators' perceptions of using AI in special education specifically in terms of ethical issues like fairness, access, transparency, privacy protection, human oversight, and inclusion.

Population and Sample

The target population consisted of Special education teachers, School administrators,

Educational technology coordinators, Inclusive education specialists and working in public and private special education institutions. Using the stratified random sampling technique, a sample of about 320 participants was taken to ensure that the sample represented different educational institutions and professional categories. A structured questionnaire was used which was designed from previous literature related to AI ethics and inclusive education.

Econometric Model

This study uses multiple linear regression (econometric) model to empirically investigate the ethical management of Artificial Intelligence (AI) in special education in Pakistan. The model aims to predict the effects of using AI, managing AI ethics, teacher readiness, and human intervention on inclusive education. The overall econometric specification of the model is:

$$IEP_i = \beta_0 + \beta_1 AI_i + \beta_2 EAI_i + \beta_3 TE_i + \beta_4 HO_i + \epsilon_i$$

Where IEP_i is the Inclusive Educational Practices (Dependent Variable), AI_i is the Level of Artificial Intelligence Integration in Special Education, EAI_i is the Ethical AI Management (fairness, transparency, privacy, accountability), TE_i is the Teaching experience (digital literacy and AI competency) and HO_i is the Human Oversight in AI decision-making. β_0 is Intercept (constant term), β_1 – β_4 is Regression coefficients and ϵ_i is the Error term (unobserved factors).

The model is an econometric framework that quantitatively examines the complex interaction of these factors in shaping inclusive education outcomes. It enables empirical testing of hypotheses and helps in evidence based policy making in the field of special education and education technology in Pakistan.

Analysis Tables

Table 1: Reliability Analysis (Cronbach's Alpha)

Variable	No. of Items	Cronbach's Alpha	Reliability Level
AI Integration in Special Education	8	0.84	Good
Inclusive Educational Practices	7	0.86	Good
Ethical AI Management	7	0.88	Very Good
Teaching Experience	6	0.81	Good
Human Oversight	5	0.83	Good
Overall Scale	33	0.87	Very Good

Table 2: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
AI Implementation	320	1.50	5.00	3.89	0.72
Ethical AI Management	320	1.40	5.00	3.76	0.69
Inclusive Educational Practices	320	1.80	5.00	4.02	0.66
Perception of AI Ethics	320	1.60	5.00	3.68	0.74
Teaching Experience	320	1.00	5.00	3.41	0.83
Human Oversight	320	1.00	4.00	2.87	0.71

Descriptive statistics revealed that participants were moderately positive about the implementation of AI in SEIs, with the mean score being 3.89 and the standard deviation of 0.72. Participants' general perceptions of inclusive practices were positive in their institutions, with inclusive education reporting the highest mean score ($M = 4.02$, $SD = 0.66$).

The scores for ethical AI management were also relatively high ($M = 3.76$, $SD = 0.69$), reflecting positive attitudes toward the ethical use and

management of AI in educational contexts. Likewise, the perception of AI ethics was high ($M = 3.68$, $SD = 0.74$), indicating moderate awareness and acceptance of ethical issues concerning the use of AI. All the standard deviations for the variables were less than 1.00, which is considered acceptable range of variability and consistency of responses. The results indicate that overall, participants indicated that use of AI and ethical management of AI were viewed as important factors in inclusive education in SE institutions.

Table 3: Correlation Matrix Analysis

Variables	1	2	3	4	5	6
1. AI Implementation	1.000					
2. Ethical AI Management	0.681**	1.000				
3. Inclusive Educational Practices	0.742**	0.698**	1.000			
4. Perception of AI Ethics	0.623**	0.711**	0.654**	1.000		
5. Teaching Experience	0.318**	0.286**	0.341**	0.297**	1.000	
6. Human Oversight	0.352**	0.331**	0.366**	0.304**	0.278**	1.000

Note: $p < 0.01$

The correlation analysis showed that there were good positive relationships between all the study variables. AI implementation was positively correlated with inclusive educational practices ($r = 0.742, p < 0.01$), signifying that the more AI technologies were implemented, the more the school had a positive impact on inclusive educational practices in special education institutions.

Responsible and ethical control of AI systems also had strong positive associations with inclusive education approaches ($r = 0.698, p < 0.01$), indicating that ethical and responsible use of AI contributes positively to inclusive educational practices. Additionally, there was a moderate

positive correlation between perception of AI ethics and inclusive educational practice ($r = 0.654, p < 0.01$), suggesting that positive ethical perceptions of AI are associated with inclusive practices.

The correlations of teaching experience and educational qualification were weaker but significant positive correlations with the major study variables. This indicates that highly qualified and more experienced teachers have more positive attitudes towards integrating and using AI in the education sector and its ethical issues. Overall, the results indicate moderate to strong relationships between the variables, which is consistent with the conceptual relationships put forward in the study.

Table 4: Multiple Regression Analysis

Independent Variables	Beta Coefficient (β)	t-value	p-value
AI Implementation	0.441	7.96	0.000
Ethical AI Management	0.362	6.41	0.000
Perception of AI Ethics	0.201	3.88	0.001
Teaching Experience	0.118	2.37	0.019
Human Oversight	0.143	2.94	0.004
R	0.824		
R ²	0.679		
Adjusted R ²	0.672		
F-value	94.73	Sig.	0.000

A multiple regression analysis was carried out to investigate the effects of AI Implementation, ethical AI management, perception of AI ethics, teaching experience, and educational qualification on inclusive educational practices in Special Education Institutions (SEIs) Tabachnick & Fidell (2019).

The overall model was statistically significant ($F = 94.73, p < 0.001$), suggesting that the selected independent variables are good predictors of inclusive educational practices. The coefficient of determination ($R^2 = 0.679$) identified that about 67.9% of the variance in inclusive educational practices was accounted for by the predictors in the model.

The integration of AI technologies is the strongest predictor with the value of $\beta = 0.441$ and $p <$

0.001, indicating that the effective application of AI can significantly enhance inclusive education practices. Ethical AI management also had a significant relationship with inclusive educational outcomes ($\beta = 0.362, p < 0.001$), reinforcing the need for fairness, accountability, and ethical management in the use of AI.

The perception of AI ethics was positively and significantly related to educational inclusion ($\beta = 0.201, p = 0.001$), suggesting that a positive ethical perception of AI is associated with an improvement in the educational inclusion. Teaching experience ($\beta = 0.118, p = 0.019$) and educational qualification ($\beta = 0.143, p = 0.004$) also had statistically significant positive effects, indicating that the more experience teachers have and their higher level of education, the more likely

they are to support the use of AI in inclusive education.

Overall, the findings corroborate the study hypotheses, showing the important role of technological and demographic factors in inclusive educational results in SEI.

Discussion of Results

This study's results offer considerable proof of the impact of the implementation of Artificial Intelligence (AI) and the management of AI for ethical purposes on inclusive education practices in special educational institutions. These findings clearly show how AI technologies, when used responsibly and properly, can have a profound impact on improving learning spaces and for students with varied educational backgrounds. The study validated Hypothesis 1: that the implementation of AI would be positively associated with inclusive education, which was indeed confirmed. The use of AI was the most significant factor associated with inclusive educational outcomes. This is consistent with past research, which also highlights the role of AI technologies in enhancing the accessibility, personalized learning, adaptive instruction, and engagement of students with special educational needs (SEN) in the classroom (Dwivedi et al., 2021).

Intelligent tutoring systems, speech recognition software, predictive analytics, and adaptive learning platforms are just a few of the educational tools that leverage AI to allow teachers to tailor learning experiences based on each student's unique abilities and learning styles. Holmes et al., (2019) state that AI technologies could help teachers to detect difficulties in learning and offer personalised interventions that enhance educational inclusion. Likewise, Luckin et al. (2016) believed that the use of AI-based systems helps to promote learning-centered education by increasing the participation of students and decreasing barriers to learning. The results also corroborate the results of Zawacki-Richter et al. (2019) who found that AI in education enhances instructional efficiency and offers personalized educational support systems to students with disabilities. Thus, the incorporation

of AI technologies can be a game-changer to advance equity and inclusion in special schools.

The regression results showed that for inclusive education, ethical AI management was a significant predictor and supported Hypothesis 2. Ethical AI management encompasses fairness, transparency, accountability, privacy safeguarding, and responsible decision-making when it comes to AI in education. This finding is in line with the call made by Floridi et al. (2018) to establish ethical governance for trustworthy and human-centred AI systems. Ethical use of AI is especially crucial in the educational context where AI tools can directly impact how students learn, are evaluated, and their education opportunities are shaped. The results are also in line with the UNESCO recommendations for AI in Education (2021) that highlight that AI technologies should respect human rights and foster inclusiveness and equity. If not developed ethically, AI can perpetuate discrimination, algorithmic bias or inequitable access to educational resources (Jobin et al., 2019).

Additionally, Holmes and Tuomi (2022) proposed that ethical AI policies are essential to help ensure that AI systems enhance teaching and learning instead of replacing it. The present study validates the institutions that have robust ethical AI governance more likely to develop safe, transparent and inclusive learning environment for special need students. The findings indicated that positive attitudes towards AI ethics had a strong impact on inclusive education practices. Educators who perceived AI technologies as ethical and beneficial were more supportive of the integration of AI in classrooms. This discovery is in line with Davis (1989) Technology Acceptance Model which suggests that the positive perception of usefulness and trust impacts on the technology adoption behavior. This can boost teachers' trust in AI systems, leading to greater adoption of AI-powered instructional resources and digital learning platforms. This can foster teachers' trust in AI systems, which can drive the increased use of AI-based instructional tools and digital learning platforms. Chiu et al., (2023) found that the ethical attitudes of teachers have a significant impact on their willingness to use AI tools in education. Positive ethical views can also minimize resistance

to the changes of technology, and foster co-innovation among teaching professionals.

The results indicate that AI ethics awareness programs and professional development should be prioritized to enhance the understanding of educators regarding responsible usage of AI. This can help boost confidence in AI systems and promote the effective integration of inclusive education technologies. The research also found that the educational qualification and teaching experience have a significant impact on the perception of AI ethics and inclusive educational practices. There were modest positive attitudes toward AI ethics and educational inclusion among more experienced and highly educated teachers. The results partially confirm Hypothesis 3 and coincide with previous research that indicates that demographic factors influence technology acceptance and digital competency (Venkatesh et al., 2003). More seasoned teachers might have already developed the ability to manage the classroom, have a more mature professional approach, and have been exposed to various strategies related to inclusive teaching, which would help them understand the benefits of AI technologies for diverse learners Selwyn (2019); Luckin (2018). Likewise, teachers with advanced degrees might be more likely to be exposed to educational technology, research, and ethical considerations about the use of AI. However, the comparatively weaker effects of the demographic variables indicate that institutional factors and ethical AI management are still more important factors for inclusive education practices.

Conclusion

The present study looked into the connection between the implementation of artificial intelligence (AI), ethical use of AI in education, and inclusive education practices in special education schools. The results indicated that the use of AI in education has a profound impact on achieving inclusive learning experiences, such as improved personalized learning, access, teaching assistance, and classroom engagement for students with special needs. The study also found that ethical management of AI is essential for responsible, transparent and fair usage of AI

technologies in educational settings. The findings indicated that the institutions which implemented AI technologies in addition to ethical governance practices were more likely to achieve effective inclusive education practices. Fairness, accountability, privacy protection and transparency were also recognized as vital aspects of ethical AI management, which is essential to achieving positive educational outcomes, according to UNESCO (2021). Moreover, the study revealed that positive attitudes towards AI ethics play a significant role in fostering AI acceptance and integration among educators. The teaching experience and educational qualification also had significant relationships with the variables related to the implementation of AI and ethics, suggesting that demographic aspects shape attitudes toward AI implementation and ethics. In conclusion, the study demonstrates that AI technologies have significant potential to revolutionize special education by enhancing learning experiences, minimizing educational barriers, and facilitating inclusive teaching. But implementing AI requires proper ethical governance, readiness of institutions, teacher awareness, and constant professional development. In the field of special education, therefore, technological development and ethical responsibility are key priorities for educational institutions to ensure the optimal use of AI to support students.

Study Limitations

The study has some limitations that should be noted, although it has contributed in so many ways.

First, the study used a cross sectional research design, and thus, it was not possible to see how AI implementation and ethical perceptions changed over time. Longitudinal studies could also offer more in-depth analysis of the lasting impact of using AI in special education settings. Second, the study was based mainly on self-reported questionnaire information obtained from educators and institutional employees. Responses provided by individuals may be influenced by their own views, personal biases, or social desirability, as well as inaccuracies about AI technologies and ethical practices. Third, the research was conducted in selected special schools and this may not reflect

the diversity of educational contexts and/or regions. As a consequence, the external validity of the results is possibly restricted, especially in more underprivileged or rural educational contexts. Lastly, the study focused largely on teacher viewpoints, and did not include in-depth participant responses from students, parents, policy makers, or AI developers. Multiple stakeholder views might offer a more holistic view of the implementation of AI in inclusive education.

Future Recommendations

In light of the findings and limitations of the study, the following are recommended for further research and educational practice.

Recommendations for Educational Institutions.

AI-powered educational tools, designed to enhance accessibility, adaptive learning, and personalised teaching, should be prioritised by special schools. School principals should also set forth guidelines for the ethical governance of AI programs to maintain fairness, accountability, transparency and data privacy. Schools should plan and conduct teachers' and administrators' regular professional development and AI literacy training. Such programs must involve more than just technical AI skills; ethical awareness, and responsible AI usage in educational environments should also be covered.

Recommendations for Policymakers

Educational policymakers need to create national guidelines and ethical framework for the use of AI

in education. These policies should guarantee access to AI technologies to everyone, particularly for students with disabilities and institutions in non-urban areas. Governments and educational authorities should also provide funding and resources for special education institutions for AI infrastructure, digital inclusion and teacher training.

Recommendations for Future Research

Longitudinal research designs will be necessary for future studies to explore the long-term effects of the implementation of AI in inclusive education. Another type of research methodology involves the use of a combination of quantitative and qualitative methods, which can provide a more comprehensive understanding of the experiences of educators and students regarding AI technologies.

More studies are needed to examine other factors, including institutional culture, digital readiness, technological anxiety, student satisfaction, and parents' attitudes toward AI-powered inclusive education. Comparative analyses across public and private institutions, between urban and rural educational systems, and between developed and developing nations can also help to gain a general sense of the challenges and opportunities of implementing AI in special education.

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