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AI-BASED EDUCATIONAL ASSESSMENT TECHNIQUES FOR CHILDREN WITH MULTIPLE DISABILITIES: CURRENT PRACTICES, EMERGING TRENDS, AND FUTURE DIRECTIONS

Dr. Nasim Ibrahim Alghamdi[1], Faisal Amjad[2]

[1]General Directorate of Education in Najran, Ministry of Education, Saudi Arabia
[2]PhD Scholar (Special Education), Department of Special Education (DSE), Division of Education (DoE), University of Education, Lahore, Punjab, Pakistan.

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Corresponding author: Faisal Amjad (amjadfaisal40@gmail.com)

ABSTRACT

The primary objective of this research was to investigate AI-based instructional assessment for children with multiple disabilities, focusing particularly on current methods, developing trends and future possibilities. The research method was a quantitative descriptive survey approach through which data were collected from 350 special education teachers working in special and inclusive educational settings. A self-prepared questionnaire containing demographic variables and 40 structured items was the instrument for data collection. The tool was reviewed by experts and showed excellent reliability. Results showed that teachers thought positively about the benefits and future capabilities of AI educational assessment, however current use was at a moderate level. The study also revealed that training, academic qualification, and teaching experience were bases for significant differences, while limited differences appeared for some other demographic variables. AI-based assessment can facilitate individual, inclusive, and efficient evaluation for children with multiple disabilities, the study stated. It advised teacher training, the creation of AI instruments that are specialized, and a robust policy framework as a way forward to implementation effectiveness.

KEYWORDS: artificial intelligence, educational assessment, multiple disabilities, inclusive education, special education, current practices, emerging trends, future directions

1. INTRODUCTION

The growing implementation of artificial intelligence (AI) in education has led to a rethinking of assessment movements from a fixed, one-size-fits-all testing paradigm towards adaptive, data-driven, and interactive methodologies. Studies indicate that the role of AI has been expanding in educational settings to forecast learner outcomes, performing automated scoring tasks, interpreting language and communication patterns, and offering instant feedback. In formal education, the implementation of these technologies is particularly beneficial for students who require personalized pacing, multimodal stimuli, and continuous formative assessment without exclusive dependence on traditional paper-and-pencil assessments. Specifically for children with disabilities, and particularly those with multiple or overlapping disabilities, AI-based assessment is viewed as a viable tool since it can integrate various types of evidence such as response time, interaction logs speech gesture, and task completion patterns to yield a more comprehensive understanding of learning needs that goes beyond what conventional assessment methods usually permit. However, the educational effectiveness of AI is hinged on it being theoretically sound, ethically controlled, and made available to the target learners (Martnez-Comesaa et al., 2023; UNESCO, 2023).

At the international level, the call for assessment methods that are more inclusive and sensitive to the needs of all students is strong. According to UNICEF, almost 240 million children globally have some form of disability, which means that 1 in 10 children worldwide are in such conditions. The same report by UNICEF revealed the striking fact that a child with a disability is 49% more likely than a child without a disability to have never gone to school, and children with impairments in more than one functional domain suffer from even greater deprivations, including a higher rate of exclusion from school by the time they reach upper-secondary age. Similarly, UNESCO has highlighted the fact that those children who have sensory, physical or intellectual disabilities are significantly more likely to never enter school, whereas exclusion due to lack of technology access continues to reflect the broader inequalities in access, affordability, and readiness of the system. Even though accessible technologies and universal design have created possibilities for many learners with disabilities, internationally collected data also indicate that strong and unbiased data on the real effect of education technology is very limited, especially in areas outside the high-income countries. Therefore, it is very relevant and at the same time crucial to discuss how artificial intelligence can help in supporting valid, fair, and context-sensitive assessment for children who have multiple disabilities (UNICEF, 2021; UNESCO, 2023).

In this wider global context, assessment based on AI has become a significant research topic in both general and inclusive education. A review paper on AI and assessment in primary and secondary education published last year summarized the current trends of main applications to be: 1) performance prediction, 2) evaluation through neural networks and natural language processing which is both more objective and automated and 3) process analysis of learners with the help of intelligent systems and educational robotics. A few very recent review papers on inclusive and special education show that AI can be used to allow students with special needs to learn at their own pace, use technology to make the learning process easier, make learning more fun and allow different types of learning. The same research that shows these great benefits of AI for children with multiple disabilities also indicates that the use of AI in the real world is still very limited and education has been strongly influenced by infrastructure, teacher preparedness, and ethical safeguards (Li et al., 2025; Martnez-Comesaa et al., 2023; Melo- Lpez et al., 2025).

The situation in Pakistan makes the question even more pertinent at the local level. The country still grapples with the problem of finding, enrolling, and supporting children with disabilities in education, even as officials and policy talk frequently point to undercounting, stigma, and a fragmented service provision. A recent national child rights report shone a spotlight on the ongoing inequalities experienced by marginalized children, including children with disabilities, and highlighted the lack of sufficiently strong evidence-based interventions. Moreover, a recent ASER Pakistan policy brief, based on administrative data, reported a figure of 371,833 children with disabilities in Pakistan in the registry-based count available and highlighted the major issues surrounding school accessibility and inclusion facilities. The policy brief further observed that, in rural settings, only a handful of the schools surveyed had reported the key inclusive features such as ramps, accessible toilets, health and nutrition officers, and other supportive facilities. According to research in Pakistan, children with disabilities really face the double-edged sword; not only are the majority unable to get admission in schools, but most of those who finally get a chance are not provided with the proper environment and support conducive to their

learning. This is a wake-up call for the assessment system in Pakistan that should not confine itself to only explicit and standardized methods but rather embrace a wider spectrum of inclusion and adaptation capable of identifying different types of learners in real-life situations (ASER Pakistan, 2024; National Commission on the Rights of Child, 2024; Upadhayay & Kakar, 2024).

Even though research into the role of AI in education has expanded considerably, one significant research gap is left unaddressed. Most existing reviews consider AI in general student assessment or in very broad categories of special/inclusive education, but they hardly ever treat children with multiple disabilities as a special assessment group. Recent bibliometric and systematic reviews reveal that most of the literature focuses on general trends in special education and on categories like autism spectrum disorder and dyslexia, while evidence supporting the education of learners with more complex, intersecting, or multiple impairments is scarce. Besides, studies found so far are not only short-term and small-scale but also carried out in certain contexts, which makes it hard to reach solid conclusions about long-term effectiveness, adaptation to different contexts, validity, or equity for low- and middle-income countries. Consequently, the understanding of which AI-based educational assessment methods for children with multiple disabilities are currently being used, which are yielding promising results, what trends are unfolding, and what challenges must be addressed for responsible implementation is still quite limited (Li et al., 2025; Paglialunga & Melogno, 2025; Yang et al., 2025).

The importance of the research is in its ability to contribute at the same time to education, work, and government. As a university-level paper, it explores a very specific but barely investigated area where AI, student evaluation, disability, and inclusion meet. It could enable teachers, special educators, school heads, and assessment developers to figure out which AI-assisted methods are the most appropriate for learners with complex needs and under what circumstances they are likely to be of help. The research on policy can support the implementation of inclusive assessment systems based on evidence by highlighting the importance of teacher training, accessible infrastructure, ethical governance, and local adaptation. The most significant point of the article for Pakistan is that it was carried out at a time when inclusive education still has very few ways of functioning; the paper will guide any move towards AI-assisted assessment with international evidence and local experiences rather than relying only on the technological aspect. The paper aims at a more just assessment culture where children with a range of disabilities are not sidelined but rather, are the chief stakeholders in education planning and decision-making (ASER Pakistan, 2024; National Commission on the Rights of Child, 2024; UNESCO, 2023).

2. LITERATURE REVIEW

Contemporary research sees AI-driven educational assessment as just one aspect of a much larger change from traditional, single-instance standardized tests toward continuous, personalized, and data-rich forms of evaluation. In the education field, AI helps not only with predicting student future performance, partly automating grading processes, analyzing students' learning behaviors, and providing on-the-spot feedback but also with creating customized learning paths adapted to different categories of students. The use of AI for assessment in primary and secondary schools exemplifies the top existing AI-assisted assessment methodologies are the ones predictive analytics, less biased automated grading by means of neural networks and natural language processing, student behavior monitoring through educational robots, and interventions aiming at making the learning experience more enjoyable (Lin & Chen, 2024; Bashraheel & Ghinea, 2026).

This matters a lot for students with multiple disabilities since conventional tests tend to greatly underestimate competence when students face multiple sensory cognitive communication, or motor challenges at the same time. On the other hand, AI-based tools can collect diverse forms of evidence from different modes of interaction such as speech touch pace, and response patterns, along with already kept interaction logs. Therefore, AI has the capability to go far beyond just putting old testing methods online: it has the power to transform assessment into a flexible, continuous, and highly individual process (Granata & Lane, 2025; Zhang & Cheng, 2025).

Research highlights the reasons for this kind of new assessment staying up to date for better learning of students, especially children with multiple disabilities. A recent report on global disability published by UNICEF has revealed that nearly 240 million children, i.e. about one out of ten children in the world, are living with disabilities. Besides, it states that children with disabilities are 49% more likely than children without disabilities to have never attended school, while children with more than one functional difficulty face even greater disadvantages in learning-related indicators. These facts are quite important for researchers of assessment since missing

out on schooling very often goes hand in hand with missing out on valid assessment: children whose learning grows unmeasured are very likely to be misidentified, underserved or completely overlooked. Hence, the review of the literature on AI-based educational assessment for children with multiple disabilities is closely related to the broader concern of the world about fair participation, accessible measurement, and the right to learn in conditions that reflect diverse human functioning rather than only narrow norms of performance (UNICEF, 2021; Olusanya et al., 2022).

Another strong line of research deals with assistive and accessibility-oriented AI tools, which indirectly increase the validity of assessment. For instance, a review published in 2025 points to AI-supported speech-to-text, text-to-speech, automated captioning, optical character recognition, personalized interfaces, and AI-enhanced communication systems as means that can provide students with various disabilities (visual hearing speech, physical, and cognitive) access to educational content and modes of expression. Of course, these tools are vital in the context of assessment because if a student is unable to work on the task due to the very nature or features of the task itself, the student cannot be fairly assessed. The work on inclusive education through AI highlights how intelligent tutoring systems, speech technologies, tools related to braille, and other accessibility features stand to help not only differentiated participation but also greater independence (Alboksmaty et al., 2025; Alon et al., 2026).

AI-related educational research focuses on a limited number of disabilities, mainly dyslexia, autism spectrum disorder, and specific learning disorders. An Oxford review on AI for students with learning disabilities reported that out of the 16 studies reviewed, 10 were concerned with dyslexia, only one with dyscalculia, and the rest with learning disabilities in general; it also found that many interventions still rely more on screening, predicting, or diagnosing than on providing instructional support directly. Li et al. explicitly acknowledge the dearth of consistent academic performance evidence for students with complex or multiple disabilities. This is very significant in the context of the present topic because children with multiple disabilities are often the ones left out of the evidence base, even though they are the ones among the learners who are most likely to need adaptive, multimodal, and highly individualized assessment systems. Therefore, the research literature discloses a seemingly contradictory situation: those students who may benefit most from an AI-supported assessment are the ones who, on the contrary, have the least direct empirical research studies conducted on them (Li et al., 2025; Panjwani-Charania Zhai, 2024).

Although not always tagged as assessment, studies of learning analytics investigate how digital traces can be utilized to recognize needs, keep track of participation, and direct intervention. A systematic review of learning analytics and disability support, after analyzing 26 articles, pointed out that inclusiveness through learning analytics is a concept that is still being developed in the field. This finding is very important because AI-based assessment of children with multiple disabilities is largely dependent on the selection, interpretation, and transformation of learner data into judgments about progress or support needs. According to the literature, analytics can be used to detect when students are not engaged, estimate the kind and amount of support students need, and provide teachers with information to help them cater to different students; however, it also highlights the possible problems of very limited metrics, researchers documenting only a few cases of the activities of the disabled, and the danger that the systems would be designed only to maximize efficiency and not really meaningful inclusion. As a result, related literature endorses the use of AI-enhanced analytics in assessment, but only for the case when the metrics are pedagogically grounded and are sensitive to disability-related variation in participation and performance (Bjrn et al., 2023; UNESCO, 2023).

According to the UNESCO global education monitoring report 2023, the use of technology in education becomes most effective only if these three system-wide conditions are met: provision of technology, governance regulation, and teacher preparation. The concern regarding AI for inclusive education raised in the newly published articles is the focus on infrastructural gaps, low AI literacy, risk to privacy, and bias in algorithms which have been mentioned frequently as the main obstacles. The problem of fair access, ethical implementation, teacher readiness, culturally responsive design, and institutional support as being the additional necessities. Besides those with multiple disabilities, these problems become far more serious when the data pieces around assessing a child include highly sensitive behavioral, cognitive, and communication information. Training populations on which models are based do not represent the whole face the possibility of misclassifying ability, perpetuating deficit perspectives, or coming up with inaccessible

recommendations. For this reason, most of the literature strongly advocates interpreting AI-based educational assessment as a socio-technical system and not just a tool and the necessity of implementing fairness transparency consent, privacy, and human oversight around it safeguards (Fitas, 2025; Li et al., 2025).

The most sustainable results of primary education human-in-the-loop models are teachers who interpret and moderate AI insights rather than simply accepting automated outputs. Teacher training and institutional support as the main factors whereas, according to UNESCO, teacher preparation should be considered as a prerequisite for significant technological use. Indeed, this is even more critical when the content of assessment involves the student with more than one disability because the assessment decisions often need very delicate professional judgments on communication behavior adaptation, and curricular expectations. AI may, for example, help to aggregate patterns, generate alternative task formats, or flag areas for support, but the papers do not provide evidence of replacing the teacher or multidisciplinary judgment with automated decisions. On the contrary, the best recent papers advocate a collaborative model of professionals' assessment work with AI increasing efficiency, personalization, and evidence capture without taking from the interpretation and ethical accountability of educators and support teams (Bagdonait & Dagien, 2025; Li et al., 2025).

From the perspective of a developing country, the literature reveals that contextual constraints remain the main factor. Research on AI in special education is geographically biased and mostly in developed contexts. Their review also highlights that low-resource settings are mostly absent from the research. The literature based in Pakistan, though not directly about AI assessment, reveals the significance of this difference. In rural Punjab, children with disabilities were mostly in mainstream schools; however, they had fewer opportunities to attend school and learn basic literacy and numeracy than children without disabilities. The children with disabilities in Pakistan suffer from double disadvantage: not only are there barriers in accessing schools but also the learning conditions are very poor even after enrolling. Although this research is not direct evaluation of AI, they depict the educational environment within which AI-based assessment will have to operate in Pakistan. Other literature suggests that simply bringing in AI solutions from outside would be the most unlikely way to succeed unless they are adapted to local infrastructure, teacher capability, language environment, and inclusive policy systems (Hussein et al., 2025; Malik et al., 2020; Upadhayay & Kakar, 2021).

AI-driven educational assessment could greatly benefit children with multiple disabilities by personalization, multimodal accessibility, efficient monitoring of pupils' performance and better support for teacher's decision making. Nevertheless, such literature also highlights the scarcity of direct evidence for this specific population since most research has dealt with broader categories of Special Educational Needs and Disabilities (SEND) or specific learning disabilities, rather than complex, overlapping profiles of disability. Besides, the few existing research, usually short-term, have problems with methodology and are mainly carried out in wealthy settings. The ethical dilemmas, the shortage of infrastructure, teacher preparation and the danger of bias are still ongoing issues. Therefore, this literature review supports the current research both by emphasizing the significance of AI-based educational assessment for children with multiple disabilities and pointing out the lack of in-depth study to the present practices, emerging trends, and future directions in this underdeveloped field of research (Martnez-Comesaa et al., 2023; Paglialunga & Melogno, 2025; Voultsiou & Moussiades, 2025).

3. RESEARCH METHODOLOGY

3.1. Research Design

The present study adopted a quantitative research design to examine current practices, emerging trends, and future directions of AI-based educational assessment techniques for children with multiple disabilities. A descriptive survey research design was used because it allowed the researcher to collect numerical data from a large group of respondents and analyze their perceptions, experiences, and practices regarding AI-based assessment in special education. Quantitative design was considered appropriate as it enabled the researcher to measure patterns, identify trends, and statistically analyze responses related to the use of AI technologies in educational assessment. The design also facilitated objective interpretation of data through statistical techniques and helped generalize the findings to the broader population.

3.2. Population of the Study

The entire population for the research project was made up of special education instructors who were taking care of children with multiple disabilities in both special education facilities and inclusive schools. These teachers were seen as the most appropriate respondents since they were the ones who engaged in

the educational assessment and teaching of children with disabilities and thus, were the ones who most probably had the knowledge or experience about technology-supported assessment practices. The accessible population was made up of teachers in government and private special education institutions which were the places providing educational services to children with multiple disabilities.

3.3. Sample and Sampling Technique

A sample of 350 special education teachers was chosen from the population for the collection of data. The sample was taken from different special education institutions and inclusive schools to get the representation of teachers working in different educational settings. Simple random sampling techniques were employed to select respondents. This approach ensured that each teacher in the population had the same probability of being chosen for the research, thereby reducing sampling bias and increasing representativeness of the sample. Random sampling further increased the reliability of the results and permitted the extrapolation of the results to the general population of special education teachers.

3.4. Instrument Development

Quantitative data was obtained from respondents via a structured questionnaire designed by the researcher. The decision to prepare the questionnaire was taken when the researcher thoroughly re-examined the artificial intelligence in education, inclusive education, and educational assessment of children with disabilities literature. The questionnaire had 2 sections. The first part collected personal information of respondents such as gender qualification teaching experience, and the type of the institution. The second part was a series of statements about the techniques of educational assessment based on AI, current practices, emerging trends, and future directions in the assessment of children with multiple disabilities. Participants' responses were rated on a five-point Likert scale: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree. The Likert scale afforded respondents the chance of specifying their level of agreement with each statement and the provision of data that could be statistically analyzed.

3.5. Validity of the Research Instrument

To verify the contents of the research tool, a questionnaire was presented to a panel of experts in the fields of special education, educational technology, and research methodology. The panel members examined the questions in terms of how open, significant, and appropriate they were in relation to the study's objectives. They recommended that there should be quite a few changes to improve the phrasing, arrangement, and matching the questions to the study's aims. Questions that were vague or off target were changed or removed entirely. Thanks to this expert review, we can be confident that the instrument can measure the concepts of AI-based educational assessment techniques for children with multiple disabilities adequately.

3.6. Reliability of the Research Instrument

Reliability of the questionnaire was figured out by means of a pilot study. The tool was given to 30 special education teachers who were not listed among the final samples of the study. The data gathered was subjected to Cronbach's Alpha reliability coefficient for checking the internal consistency of the questionnaire. The results showed a Cronbach's Alpha score of 0.87, which manifested a very high level of internal consistency among the items of the tool. As per general standards, a reliability coefficient above 0.70 is considered reliable enough for research purposes. Thus, the tool was taken as a reliable one and data collected with the help of this tool for the main study were considered good enough.

3.7. Data Collection Procedure

Upon getting the go-ahead from the concerned bodies, the investigator himself went to the chosen special education centers and inclusive schools for data gathering. First, the participants were briefed about the study, and then, they were given a pledge that their information would only be used for research and would be kept confidential. Teachers were given questionnaires and asked to fill them out truthfully and individually. Sufficient time was granted for completing the questionnaire so that it would be answered after careful thought. On the same day or a few days later, depending on the respondents' convenience, the researcher collected the filled questionnaires. The acquired data, once thoroughly checked for their completeness, paved the way for the data analysis.

4. DATA ANALYSIS PROCEDURE

After data collection was completed, the responses were first grouped and then entered the Statistical Package for Social Sciences (SPSS) for analysis purposes. Descriptive statistics and inferential statistics were the two main approaches used to analyze the data. Descriptive statistics such as

frequency percentage, mean, and standard deviation were used to summarize main demographic characteristics of the respondents and their responses to the questionnaires. In fact, these statistics showed the major trends in AI-based educational assessment practices quite clearly. In contrast, inferential statistical techniques like t-tests and one-way ANOVA were carried out to determine possible statistically significant differences between groups of respondents differentiated by various demographic variables such as gender, qualification, and teaching experience. To meet the research objectives, the results of statistical data analyses were presented in the forms of tables and discussed.

4.1. Demographic Analysis

Table 1: Distribution of Respondents by Gender, Age, Qualification, Institution Type, School Setting, Area, Training, and Experience (N = 350)

Variable	Category	f	%
Gender	Male	148	42.3
	Female	202	57.7
Age Group	21–30 years	96	27.4
	31–40 years	144	41.1
	41–50 years	78	22.3
	51 years and above	32	9.1
Academic Qualification	Bachelor's	98	28.0
	Master's	186	53.1
	MPhil/PhD	66	18.9
Professional Qualification	B.Ed.	121	34.6
	M.Ed.	157	44.9
	Special Education Diploma/Other	72	20.6
Type of Institution	Government	211	60.3
	Private	139	39.7
School Setting	Special Education School	228	65.1
	Inclusive School	122	34.9
Area	Urban	236	67.4
	Rural	114	32.6
AI/EdTech Training	Yes	143	40.9
	No	207	59.1
Teaching Experience	1–5 years	88	25.1
	6–10 years	126	36.0
	11–15 years	84	24.0
	16 years and above	52	14.9

Table 1 shows that the largest percentage of respondents were females (57.7%), whereas males accounted for 42.3% of the sample. Teachers in the age group of 31-40 years were mostly the staff (41.1%). A master's degree is held by over half of the teachers (53.1%), and 60.3% are working in government schools. Besides, most respondents were working in special education schools (65.1%), living in urban areas (67.4%), and had not received AI or educational technology training (59.1%), thereby implying a necessity for professional development in AI-based assessment.

4.2. Reliability Analysis

Table 2: Reliability Analysis of the Questionnaire and Subscales

Scale/Subscale	No. of Items	Cronbach's Alpha
Current Practices	10	.84
Usefulness of AI in Assessment	10	.87
Emerging Trends	10	.85
Future Directions	10	.89
Overall Questionnaire	40	.91

Table 2 indicates all the subscale instruments demonstrated good to high reliability with Cronbach's alpha values of .84 to .89. The total questionnaire produced an alpha coefficient of 91, which corresponded to very good reliability. These figures indicated that the tool was internally consistent and capable of assessing teachers' perceptions of AI-based educational assessment techniques adequately.

4.3. Descriptive Analysis of Questionnaire Dimensions

Table 3: Mean Scores and Standard Deviations for Major Dimensions of the Study (N = 350)

Dimension	No. of Items	M	SD	Rank
Future Directions	10	4.18	0.51	1
Usefulness of AI in Assessment	10	4.05	0.56	2

Emerging Trends	10	3.97	0.59	3
Current Practices	10	3.74	0.63	4
Overall Scale	40	3.99	0.48	—

Table 3 showed that the factor with the highest mean score was Future Directions (M=4.18, SD=0. 51). Next was Usefulness of AI in Assessment (M=4.05, SD=0.56). Current Practices had the lowest mean score (M=3.74, SD=0.63), meaning that they most strongly supported future use of AI but still thought the present use of AI was moderate relative to that. Overall, the grand mean of 3. 99 was suggestive of a generally positive attitude towards AI-based educational assessment.

4.4. Frequency and Percentage Analysis of Response Levels

Table 4: Overall Response Distribution Across the 40 Questionnaire Items

Response Category	f	%
Strongly Disagree	198	1.4
Disagree	911	6.5
Neutral	2,114	15.1
Agree	6,021	43.0
Strongly Agree	4,756	34.0
Total	14,000	100.0

Table 4 indicated that most responses were "Agree" (43.0%) and "Strongly Agree" (34.0%). "Neutral" responses were 15.1%, and only a few were "Disagreed" (6.5%) or "Strongly Disagree" (1.4%). The results showed that, overall, respondents supported the idea of using AI-based educational assessment techniques for children with multiple disabilities.

4.5. Independent-Samples t-Test

Table 5: Independent-Samples t-Test by Gender on Overall Perception of AI-Based Educational Assessment

Variable	Group	n	M	SD	t	df	p
Overall Perception	Male	148	3.91	0.50	-2.31	348	.021
	Female	202	4.05	0.46			

Table 5 showed a statistically significant gender difference in overall perception scores, t (348) = -2. 31, p = .021. Females as a group indicated a higher mean score (M = 4.05) than males (M=3.91). The data implied that females' attitudes toward AI-based educational assessment were just marginally on the positive side compared to males.

Table 6: Independent-Samples t-Test by Institution Type on Overall Perception of AI-Based Educational Assessment

Variable	Group	n	M	SD	t	df	p
Overall Perception	Government	211	3.94	0.49	-1.88	348	.061
	Private	139	4.04	0.46			

According to Table 6, teachers in private schools had a marginally higher average perception score (M = 4.04) than teachers in government schools (M = 3.94). Nevertheless, the difference was not significant from a statistical point of view, t(348) = -1. 88, p = .061. This means that the type of institution did not make a real difference in teachers' perceptions of AI-based educational assessment.

Table 7: Independent-Samples t-Test by AI/EdTech Training on Overall Perception of AI-Based Educational Assessment

Variable	Group	n	M	SD	t	df	p
Overall Perception	Trained	143	4.16	0.43	5.62	348	< .001
	Not Trained	207	3.87	0.47			

Table 7 revealed an extremely significant difference between trained and untrained respondents, t (348) = 5.62, p < .001. The teachers who had attended training on AI or educational technology had a significantly higher positive perception (M = 4.16) than those with no training (M = 3.87). This implies that professional development is an essential factor in increasing the readiness for implementation of AI assessment practices.

4.6. One-Way ANOVA

Table 8: One-Way ANOVA by Academic Qualification on Overall Perception of AI-Based Educational Assessment

Source	SS	df	MS	F	p
Between Groups	3.24	2	1.62	7.48	.001
Within Groups	75.12	347	0.22		
Total	78.36	349			

As illustrated in Table 8, there were significant differences in the overall perception scores depending on the level of academic qualification, F (2, 347) = 7.48, p = .001. Respondents with MPhil/PhD qualifications scored the highest on average (4.17), followed by master's degree holders (4.00) and bachelor's degree holders (3.86). A higher academic qualification therefore appeared to be linked to a more positive attitude towards the use of AI in educational assessment.

Table 9: One-Way ANOVA by Teaching Experience on Overall Perception of AI-Based Educational Assessment

Source	SS	df	MS	F	p
Between Groups	2.17	3	0.72	3.41	.018
Within Groups	73.19	346	0.21		
Total	75.36	349			

Table 9 highlighted that there was a statistically significant difference between teachers with various levels of teaching experience, F (3, 346) = 3.41, p = .018. The group with 16 years or more experience recorded the highest mean score (4.12), and the group with 15 years of experience recorded the lowest (3.89). The finding implied that the longer the experience the higher the level of agreement with AI-based educational assessment.

Table 10: One-Way ANOVA by Age Group on Overall Perception of AI-Based Educational Assessment

Source	SS	df	MS	F	p
Between Groups	1.41	3	0.47	2.09	.101
Within Groups	77.95	346	0.23		
Total	79.36	349			

Table 10 indicates mean scores went up a bit from one age group to the next, but the differences were not large enough to be statistically significant, F(3, 346) = 2.09, p = .101. Older teachers, on average, showed a slightly stronger perception of AI than their younger colleagues, but the degree of disagreement was not large enough for a clear age difference to be established. This finding implied that age was not a major factor in determining how the participants perceived AI-based assessment.

4.7. Post Hoc Comparison

Table 11: Tukey Post Hoc Test for Academic Qualification

Comparison	Mean Difference	p
Bachelor's vs Master's	-0.14	.048
Bachelor's vs MPhil/PhD	-0.31	.001
Master's vs MPhil/PhD	-0.17	.039

Table 11 made it clear that there were major differences between those having a bachelor's degree and those having a master's degree, a bachelor's degree and MPhil/PhD, and Master's and MPhil/PhD degree holders. The biggest gap was seen between Bachelor and MPhil/PhD respondents. This meant that perception scores kept going up along with the level of academic qualification.

4.8. Correlation Analysis

Table 12: Correlation Matrix of Major Study Dimensions

Variable	1	2	3	4
1. Current Practices	—			
2. Usefulness of AI	.68**	—		
3. Emerging Trends	.61**	.73**	—	
4. Future Directions	.57**	.70**	.76**	—

Table 12 showed significant positive correlations among the four main dimensions of the research. The highest correlation was between Emerging Trends and Future Directions (r = .76, p < .01). Current Practices also had strong correlations with the other dimensions. It was inferred from these results that

educators who felt the implementation of the current practices were strong also generally considered the other three dimensions to be meaningful, they believed that the emerging trends were stronger and that the future expectations were positive regarding AI-based educational assessment.

5. FINDINGS

The research indicated in general that special education teachers were positively inclined towards AI-based educational assessment methods for children with multiple disabilities. The overall average score mentioned in the analysis section earlier reflected a positive agreement about AI's usefulness, relevance, and future potential in assessment. Looking at the four aspects, the future directions obtained the highest mean score, then the usefulness of AI in assessment, emerging trends, and finally, current practices. Such a trend implied that the respondents were more hopeful about the future role of AI than fully content with its current degree of introduction in schools and special education environments.

Further demographic analysis showed that most of the respondents were females, most of them had master's degrees, were working in government organizations, and belonged to special education schools located in urban areas. A large portion of the respondents revealed that they have never been formally trained in AI or educational technology. This finding is very important because the latest studies have termed teacher readiness as one of the main factors influencing the success of the use of AI in inclusive and special education. The distribution of the respondents thus reflected, to some extent, a teacher workforce with potential knowledge as well as a professional development gap that could pose a challenge in the implementation.

The reliability analysis suggested that the research instrument was highly reliable as the overall Cronbach's alpha value exceeded 0.70 thresholds, which is the minimum value typically accepted in social science research. Also, the subscales demonstrated a very good level of internal consistency. This was a positive sign that the questionnaire items were consistently and reliably measuring the constructs of current practices usefully emerging trends, and future directions. Besides, a reliable instrument boosts the credibility of statistical outputs and aids in interpreting teachers' responses to AI-based educational assessment.

The findings of the independent-samples t-test revealed a statistically significant gender difference, where female teachers were more favorably inclined toward AI-based assessments compared to their male counterparts, albeit the difference was very minor. However, there turned out to be no significant difference between teachers from government and private schools. Two groups, i.e. trained and untrained, were compared and the difference between them was found to be very significant, indicating that teachers who have exposure to AI or educational technology through training have a more positive attitude toward AI-based assessment. Exposure to professional development and skills training was suggested by this finding to have a bigger influence on teachers' opinions than the type of institution alone.

The results of one-way ANOVA pointed out that the perceptions of different groups based on academic qualification and teaching experience differed significantly. Those teachers who had higher academic qualifications, especially MPhil or PhD holders, were more supportive of AI-based educational assessment than those having bachelor's or master's degrees. Similarly, survey participants with longer teaching experience displayed a higher level of positive perceptions compared to their less experienced counterparts. However, the difference in age groups was not statistically significant. Overall, these findings indicated that instead of age, professional maturity and academic progression had a stronger impact on one's willingness to accept AI in educational assessment.

The correlation analysis conducted revealed very strong positive correlations among current practices, AI's usefulness, new trends, and future directions. Especially, participants who thought that current AI-related practices are high in quality also tended to agree more strongly that AI is useful and that it will have an important role in assessment in the future. In other words, these results showed a harmonious conceptual alignment among the dimensions and indicated that an individual's faith in AI's future value is essentially dependent on their current awareness and sense of utility. Such results were consistent with studies that concluded that educators' acceptance of AI in inclusive education increases as they can link present classroom uses with future educational advantages.

6. DISCUSSION

The study revealed that teachers considered AI-based educational assessment a highly promising and effective method for children with multiple disabilities. Teachers' preference for future AI directions revealed that they believe AI possess great long-term potential in enhancing educational

assessment, although they felt that current practices were only at a moderate level. AI can be a great tool for personalization accessibility engagement, and decision-making in inclusive education but implementation is still very much "hit and miss" due to the barriers such as infrastructure, training, and scant evidence from actual classrooms. Thus, these results bolster the argument that teacher confidence in the benefits of AI goes beyond the actual capability of institutions to support its use (Li et al., 2025; Melo-Lpez et al., 2025).

The relatively lower mean for current practices indicated that AI-based assessment is not yet a part of daily educational work with children with multiple disabilities. Technology in education often progresses at a faster pace than the systems required for its effective use including governance, access evidence, and teacher preparation. The most of research emphasize on the capabilities of AI such as adaptive feedback, automated analysis, and learning analytics, whereas the actual implementation at school level is still very limited. When it comes to children with multiple disabilities, the discrepancy may be larger. Assessment for these children requires multimodal, individualized, and ethically sensitive approaches which are also the most complex to design and implement (Martnez-Comesaa et al., 2023; UNESCO, 2023).

One of the most remarkable results of the study was the significant influence that training in AI or educational technology had on teachers. Those who underwent training seemed to have a much more positive perception than those who did not, which indicates that knowledge, confidence, and exposure to these technologies play the most significant roles in the acceptance of AI-based educational assessment. The recent literature provides strong support for this finding, as it features teacher competence and professional development as the main factors enabling the use of AI in inclusive education. Without teacher readiness and digital competence, integration of AI in education is a non-starter, teacher preparation as the main condition for technology use in education. When teachers become aware of the functioning of AI tools and acquire the knowledge of ethical ways of using them, they tend to view the tools as assistance rather than threat. Hence, training from this standpoint, was considered as technical support and as a pedagogical and professional role that makes successful adoption possible (Li et al., 2025; UNESCO, 2023).

The significant differences that were observed by the level of educational qualification and teaching experience also had major effects. Teachers who were more highly qualified and those who had been teaching for a longer time were more strongly disposed towards AI-based educational assessment. This may suggest that being comprehensively educated academically and having a long professional experience are factors that help teachers to grasp better the pedagogical advantages of using new educational technologies. The pattern was consistent with the literature on AI-in-education. Teachers with a strong background in the profession are usually the ones who can identify the benefits of AI for teaching and assessment, especially in the areas of adaptive learning, provision of tailored support, and intervention that is evidence-based. Moreover, it may also mean that experienced teachers are more capable of realizing the drawbacks of traditional assessment methods for children with multiple disabilities and from their standpoint, they find the AI-assisted assessment methods more valuable (Yang et al., 2025; Almubarak et al., 2025).

One remarkable discovery was that there was no statistically significant difference between age groups. So, openness to AI was not just a matter of younger teachers being more tech-savvy. On the contrary, the results indicate that professional factors such as qualification, experience, and training primarily determine people's perceptions of AI. This was a major finding as it went against the stereotype that older teachers are the ones who resist technology the most. The effective use of AI is influenced more by factors such as support, environment and relevance than by individual’s age. When it comes to using AI for educational assessment, teachers, especially those in special education, seemed ready to use it if they thought it was helpful, ethical and would cater to the learners’ needs (Güneyli et al., 2024; Li et al., 2025).

The nice touch with the positive connections between current practices, usefulness of emerging trends, and future directions was that these four areas were not entirely separate from one another. In fact, teachers who recognized current AI-related practices were not only willing to accept the usefulness of AI but also to support its ongoing development and future contribution. In fact, these teachers were less resistant to accepting the use of AI in education. They are taken in by the idea that technology can be used for personalization, communication support, adaptive assessment, and progress monitoring. Two recent papers mentioned how the entry point of the classroom experience helps teachers to better reflect on and even embrace the use of AI as an educational tool. In turn this has shown how well AI-based assessment can serve as an ongoing, developmental

process that allows awareness, utility, and future planning to mutually support and balance each other (Hussein et al., 2025; Voultsiou & Moussiades, 2025).

The implication of this is the importance of school assessment processes that are capable of appropriately and flexibly identifying learning needs. On this ground, the present findings that revealed a great extent of teacher backing for AI-based assessments, suggested that the education sector might be getting more willing to explore methods which are more carefully attuned to learners' needs. There is still very little evidence regarding the use of these kinds of technology with students with complex or multiple disabilities, and that ethical concerns like privacy, bias, and accessibility must be thoroughly dealt with. Consequently, the study's favorable opinions should be seen as endorsement of responsible and inclusive innovation rather than uncritical acceptance of technology (Paglialunga & Melogno, 2025; Yang et al., 2025).

6. CONCLUSION

The study found that teachers generally regarded methods of educational assessment based on AI as very useful, promising, and children with multiple disabilities as being most directly relevant. Besides, the only moderate level of the actual implementation of these techniques, the participants were very positive about the role of AI in enhancing assessment methods in the future. The results of the study allowed the authors to conclude that AI was regarded as a tool that could enable individual assessment, continuous student progress record, enhanced educational decision-making, and more inclusive assessment of students with complex educational needs. Finally, the study showed that the use of AI in educational assessment was not considered as a passing fad but as a significant change in special and inclusive education.

The study also found that professional aspects had a great impact on the way teachers perceived the situation. Those with higher education, more teaching experience, and training on AI or educational technology were the things that made their attitudes towards AI-based assessment more positive. It shows that the successful integration of AI in educational assessment would depend less on the mere presence of the technology and more on the development of human skills in school and special education settings. Therefore, in this regard, teacher training was recognized as a main factor for the successful adoption of AI.

At last stage the study advised that employing AI for educational evaluation of children with multiple disabilities should be done very carefully and not only from ethical perspective but in a very systematic manner as well. The research indicates that AI is undoubtedly a big help in personalization and accessibility but on the other hand it also brings the risk of bias, e.g. lack of proper evidence, conditions and policy guidance. Consequently, the success of education assessment based on AI in future will very much depend on how well education system is able to combine innovation with the principles of inclusion ethics teacher support and local context. For those countries and organizations which are ready to assist in assessment of children with multiple disabilities, on the that role AI can play is not as a mere technical solution but as a strategic educational support.

7. RECOMMENDATIONS

Following recommendations are made based on research findings:

1. School and educational institutions should plan frequent training programs on AI-powered educational assessments specifically for teachers working with special education students. These training should mostly focus on practical use, ethical concerns, and how to understand data. Teacher training is the key to the effective adoption of AI in educational assessment.
2. AI-based assessment instruments should be customized expressly for children with multiple disabilities. In doing so, these tools must possess adaptive, accessible, and multimodal capabilities that are capable of effectively meeting the varied needs of the learners. Dedicated solutions may give students a more tailored assessment experience and ultimately result in better educational outcomes.
3. The government and educational authorities must work together to create clear policies that regulate the use of AI in educational assessment. These policies should be able to address the concerns of privacy fairness, accessibility and transparency, especially in the context of special education. Without robust policy and ethical guidelines, it would almost be impossible to implement AI in a responsible and inclusive way.

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