Traditional vs. Technology-Assisted Assessments: A Comparative Study of Students with Disabilities in Pakistani Higher Education.

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ABSTRACT

This study compares perceptions of Traditional vs. Technology-Assisted Assessment Methods among 200 students with disabilities (visual, hearing, learning, physical, cognitive) in Pakistani higher education. Descriptive statistics of a validated 26-item Likert-scale questionnaire showed strong preferences to technology-assisted assessments based on the characteristics of screen readers, speech-to-text, flexible timing and immediate results, despite the moderate perceptions of reliability and significant technical difficulties associated with infrastructure gaps. The results of inferential analysis (t-tests, ANOVA) showed that there were significant differences by gender (females more positive), disability type, age, institution (public higher), and learning mode, which indicated contextual moderators. Results are consistent with the world literature on the potential of digital tools in inclusive assessment and highlight the challenges facing developing countries to adopt digital assessment such as connectivity and support. Findings suggest infrastructure investments, universal design policy, and blended models as a means of improving equity, performance, and autonomy of disabled students.

Keywords: *Technology-Assisted Assessment, Traditional Assessment, Students with Disabilities, Accessibility, Higher Education.*

INTRODUCTION

The assessment practices are central in defining the education opportunity and outcome of the students with disabilities, but most of the schools still rely on the old traditional methods of conducting tests based on paper and time where most of the students with disabilities may not be well represented. Technology-assisted assessment, such as online testing, AI-based grading, and digital systems with inherent features of accessibility like screen readers, speech-to-text, and alternative response options, have become a promising field of investigation in recent years to add to fairness, accessibility, and individualized support of students with disabilities. International literature identifies the possibility of assistive and digital technologies to promote participation, engagement, and academic achievements of students with various disabilities through careful design and integration into teaching and assessment activities. Nevertheless, there are still

debates on equity, reliability, validity, technical issues and data privacy as far as transitioning between traditional and technology-assisted assessment models of this population is concerned (Pang & Datu, 2025; Lancioni et al., 2023; Dumitru et al., 2024; Olakanmi et al., 2020; Khasawneh & Ahmad, 2024).

Conventionally, special and inclusive education assessment has been based on the traditional psychometric testing, standardized tests, and teacher-constructed paper-based tests, which focused on simple skills and visible performance instead of actual performance in real-life situations. A worldwide trend towards an assessment culture, rather than an examination culture has existed since the early 21st century, with formative, authentic and performance based methods becoming more popular as a means of assessing and capturing complex learning, problem solving and functional skills within students with disabilities. Alongside this pedagogical movement, the high-speed development of information and communication technologies, learning management systems, and assistive materials has produced new possibilities to develop more flexible, multimodal and individualized assessments. Nevertheless, even with such advancements, integrating technology into student-disability assessment is not yet fair, and many systems continue to be unable to go beyond one-size-fits-all systems (Pang & Datu, 2025; Khasawneh & Ahmad, 2024; Kalemkuş, 2025; Pradhan & Gochhayat, 2023; Tariq & Sergio, 2025).

In the local situation of Pakistan, learning management system and online testing are slowly being implemented in universities and special education institutions, especially following the COVID-19 pandemic, but students with disabilities usually have to face infrastructural constraints, weak technical support, uneven access to assistive technologies during testing. Locally, there is some evidence indicating that although some higher education institutions are experimenting with blended and online assessments, policies, teacher training, and assessment design guidelines do not tend to anticipate accessibility, universal design, or accommodations to students with a visual, hearing, learning or physical disability. This means that most disabled learners in Pakistan are still required to rely on the traditional paper-based tests, scribes or informal teacher accommodations, which might be not systematic in terms of fairness, standardization, or autonomy (Pradhan & Gochhayat, 2023; Miller, 2025; Sugiyama et al., 2025).

On the international scene, inclusive digital assessment, universal design learning and AI-powered assistive technologies capable of providing custom feedback, multimodal presentation of activities, and adaptive levels of difficulty to students with disabilities are gaining importance. Research in a wide range of nations documents that technology-based assessment used in conjunction with suitably accessible features and institutional assistance can enhance engagement, motivation and self-efficacy in students with disabilities as well as furnish educators with more information about student performance. Simultaneously, recent reviews report ongoing issues like technological unfairness, teacher readiness, the threat of algorithmic bias in AI-assessed assessment, and inconsistency in the application of accommodations between institutions and systems. These international tendencies bring the necessity to consider rather context-specific research whereby traditional and technology-assisted approaches to assessing students with disabilities are compared systematically in particular educational contexts (Lancioni et al., 2023; Pradhan & Gochhayat, 2023; Dumitru et al., 2024; Pang & Datu, 2025).

The fundamental issue in most situations, such as in Pakistan, is that the assessment systems have not kept abreast with the developments in the field of inclusive pedagogy and educational technology, and as a result, the abilities, knowledge and skills of students with disabilities may be misrepresented. Traditional methods can be physically, sensually, or time-restrictive, but technology-based methods can impose new barriers like poor connections, no specific software, or insufficient tech support, so providing an unequal opportunity to succeed. Without an empirical evidence of comparing perceptions of the students, accessibility experiences, reliability, fairness and performance results in both traditional and technology-

aided assessment modes, the policy makers and practitioners should run the danger of making assumptions instead of basing their decisions on facts (Black & de Pablos-Ortega, 2025; Pradhan & Gochhayat, 2023).

The potential of digital and AI-driven tools to enable accessibility and learning has already been well-documented in recent international research, but comparatively less empirical research specifically investigates students with disabilities in developing countries in higher education and specifically analyzes assessment and not just instruction. The current literature has tended to include students with disabilities as minor and part of larger samples, has rarely made comparative analysis of traditional and technology-based assessment, or has ignored context-specific limitations such as infrastructure, policy, and teacher competence. Majority of papers in Pakistan and other related settings have focused on inclusive education policy, the attitude of teachers or overall utilization of assistive technology, but very few have methodically compared assessment practices in the eye of students with disabilities. This gap in research justifies a concerted comparative study which focuses on investigating the ways of how students with disabilities find reliability, fairness, accessibility, engagement, and performance in conventional and technology assisted assessment conditions in the local higher education institutions (Pradhan & Gochhayat, 2023; Pang & Datu, 2025; Lancioni et al., 2023; Dumitru et al., 2024).

Based on this gap, the current research is meaningful in various aspects to students, teachers, institutions, and policy makers. First, it offers empirical data on the effects of students with disabilities on the use of traditional and technology-assisted assessment methods, which can be supplemented with factual data to create more fair and inclusive assessment policies in higher education. Second, the research can assist the special education practitioners and university educators to comprehend which characteristics of technology-based assessment, including instant feedback, assistive tools, flexible time, and multimodal presentation, can best facilitate participation and learning among the varieties of disability categories. Third, the results can help inform future capacity-building efforts, infrastructure investment, and design of assessment-based guidelines based on universal design, through pointing out the advantages and disadvantages of digital assessment to the students themselves (Pradhan & Gochhayat, 2023; Pang & Datu, 2025; Lancioni et al., 2023; Dumitru et al., 2024; Black & de Pablos-Ortega, 2025).

Based on these issues, the current research paper will be informed by three research questions within the context of this overall importance: How do students with disabilities perceive the reliability, fairness, and trust in the assessment outcomes of both traditional and technology-assistive assessment methods; how do students experience the accessibility, convenience, technical difficulties, and use of assistive devices in both assessment systems; How do traditional and technology-assisted assessment systems differently affect their engagement, test anxiety, confidence, and academic achievements in higher education institutions?

Objectives of the Research

1. To compare the perceptions of reliability, fairness, and accuracy of higher education students with disabilities when comparing the use of technology-assisted assessment and traditional assessment.
2. To investigates the levels to which the traditional assessment and technology-assisted assessment offer easily available, convenient and technically enabling conditions to students with various kinds of disability.
3. To understand the effects of traditional and technology-assisted assessment on student engagement, anxiety, confidence and academic achievement and use the results to make inferences about inclusive policy and practice in assessment.

LITERATURE REVIEW

The literature on assessment of students with disabilities includes a substantial trend towards technology-enabled and AI-enabled assessment tools as a solution to enhance student accessibility and personalization and student academic achievement, but it also presents unexplored issues regarding equity and reliability and teacher preparedness. Recent reviews highlight that digital and AI-based assistive technologies can assist students with physical, sensory, and learning disabilities with the help of such features as speech-to-text, AI-based screen readers, predictive typing, adaptive platforms, and multimodal interfaces that can be implemented in both teaching and testing. Simultaneously, the empirical and theoretical literature indicates the necessity of human-oriented and ethically specific design of digital assessment systems and orient on transparency, explainability, and reduction of algorithmic bias to ensure that AI-enhanced assessment can indeed contribute to increased inclusion rather than repeat a priori disparities (Dumitru et al., 2024; Kchaou et al., 2025; Pang & Datu, 2025).

An emerging range of post-2020 studies records the role of assistive and digital technologies as important supports in special and inclusive education, that have a direct impact on the experiences of students via assessment. Pang et al. (2025) posit that the academic growth and engagement of students with disabilities in digital assistive technology interventions is possible, especially when integrated into the wider learning and assessment activities. Similarly, research on the use of assistive technology in special education points to the fact that even access-oriented devices and software (screen readers, communication that uses symbols, and other forms of alternative input) affect how students interact with test materials and reveal their knowledge. These results indicate that whenever making any comparison between the traditional and technology-assisted assessment, the mediating role of assistive tools that may or may not compensate or exacerbate inherent barriers to assessment design should be considered (Kchaou et al., 2025; Pang & Datu, 2025; Yang et al., 2025).

The importance of the research on inclusive digital platform and online learning environment provides a crucial layer to the understanding of technology-assisted assessment in disabled learners. Van Calis et al. (2025) demonstrate that digital platforms that are inclusive of people with mild intellectual disability or low literacy should be carefully considered in terms of navigation, high visual clarity, and interaction design that can allow one to meaningfully participate in the digital examinations or quizzes. Online education has been found to be mixed in terms of learning and satisfaction outcomes in scoping reviews with positive results of well-designed online environments being found to provide flexibility, self-pacing, and richer feedback which are directly applicable to the assessment context. These factors of design and interaction of platforms are influential to students with disabilities in the way that technology-facilitated assessment can be felt as empowering or exclusionary (Lee et al., 2025; Pang & Datu, 2025; Kyei-Akuoko et al., 2025).

On the assessing quality level, current studies reflect critical differences between the conventional paper-based testing and the digital assessment systems in respect to validity, feedback, engagement, and special education appropriateness. Online testing is conducive to adaptive testing, automated scoring, and real-time feedback, which may offer a subtler visual of the learning process and minimize the time lag caused by manual scoring. In students with motor, visual, or language-based challenges, adjustable font size, contrast between colors, audio cues, and speech-to-text options can be used to mitigate construct-irrelevant barriers to allow them to prove competence without handwriting or speed limitations. Nevertheless, it is also reported in literature that traditional assessments are still significant in some high-stakes situations and might be viewed as a more familiar or stable option particularly where the digital infrastructure is unreliable (Kefalis et al., 2025; Garzón et al., 2025; Wang et al., 2025).

Multiple recent studies and reviews warn that technology-aided assessment is not always advantageous and can create additional types of inequality in case the infrastructural and pedagogical requirements are feeble. Surveys of the access to inclusive digital and healthcare technologies indicate that unfair access to devices, low-bandwidth settings, unspecialized software, and low digital literacy among learners and practitioners can make AI-based and online tools promising. In case of students with disabilities, poor internet connectivity, incomplete interfaces, and lack of technical assistance in case of online examinations may increase anxiety and adversely affect the performance of assessment regardless of the existence of powerful digital features. These results highlight the need to approach any analysis of technology-mediated assessment with the understanding that the larger ecosystem of infrastructure, policy, and support should be taken into account instead of the tool itself (Pang & Datu, 2025; Kchaou et al., 2025; Garzón et al., 2025; Wang et al., 2025).

In the context of students with learning disabilities and related needs, empirical studies have shown in recent times that technological rich learning and assessment environments have the potential to improve academic performance when carefully considered. Research notes that simulations, interactive activities and scaffolded online activities enable students with learning disabilities to access the material in multimodal forms and train their skills in conditions of low-pressure prior to formal evaluation. Technology-assisted assessment can provide a greater chance of repeated practice, feedback and demonstration of comprehension in a variety of response formats when similar design principles are applied to summative or formative tests. However, the evidence basis continues to focus more on the outcomes of instructions, thus the effects of the assessment are less well examined (Pradhan & Gochhayat, 2023; Wang et al., 2025; Kefalis et al., 2025).

The use of AI-controlled assessment and support tools is a relatively promising line of literature since 2020, and its direct application can have a direct impact on students with disabilities. The review of the literature on AI-based assistive technologies, including intelligent tutors, AI-enhanced text-to-speech, automated grading, and adaptive learning platforms, by Dumitru et al. (2024) demonstrates that accessibility, engagement, and performance of disabled students in higher education can potentially be improved in cases where ethical and user-centered concerns are upheld. Industry 5.0-related reviews also highlight that people with disabilities can have better diagnostic and evaluative services offered by human-centered AI, but in addition, there is a warning regarding algorithmic bias, a lack of disability data, and explainable AI in high-stakes settings is a necessity. In the case of educational assessment, these insights play out in the form of both the chances to have individual and dynamic assessment and grave concerns regarding transparency, fairness and data protection when AI systems are incorporated in testing and grading students with disabilities (Kchaou et al., 2025).

Although this literature on assistive technology and inclusive digital platforms, and AI-enhanced tools is growing fast, clear comparative research around traditional and technology-assisted assessment among students with disabilities is scant in higher education and among the Global South. Assessment is often seen in many reviews as a part of larger technology integration or inclusive education programs, without explicitly comparing the experiences of reliability, fairness, accessibility, and performance in assessment across assessment modes. Further, the empirical literature in areas like Pakistan is also significantly lacking and infrastructure, policy frameworks and teacher preparation to inclusive digital assessment in such countries in high income countries are often strikingly different. The gap supports the necessity of context-specific, learner-centered studies that directly compare traditional and technology-based assessment procedures on students with disabilities in terms of such constructs as reliability and fairness, access and technical issues, engagement, and feedback and their overall impact on academic performance in local institutions of higher learning (Kchaou et al., 2025; Pradhan & Gochhayat, 2023; Wang et al., 2025; Pang & Datu, 2025; Yang et al., 2025; Dumitru et al., 2024).
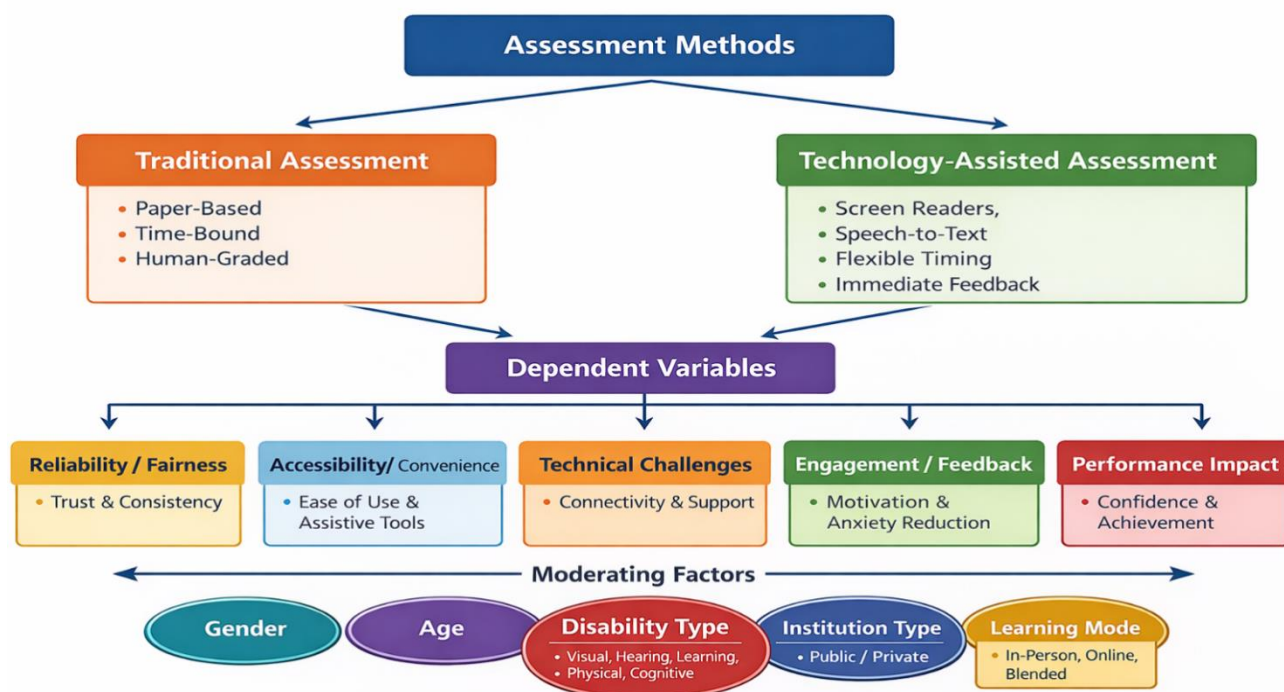
Conceptual Framework

Figure 1: Assessment methods for students with disabilities

This conceptual framework describes the effect of various methods of assessment, traditional and technology-assisted, on the outcome of assessment of students with disabilities. Traditional (paper-based, time-based, human-graded) and technology-assessed (use of assistive technologies, flexible timing, and instant feedback) are regarded as independent variables. Such approaches influence some of the major dependent variables, such as reliability and fairness, access and convenience, technical issues, student engagement and feedback, and overall performance influence. Gender, age, type of disability, type of institution and mode of learning are some demographic and contextual factors that moderate the relationship between assessment methods and outcomes and may influence the experience and perception of assessment among students.

RESEARCH METHODOLOGY

Research Design

To collect the perceptual data of assessment experience in Likert-scale responses, a quantitative descriptive survey design was adopted, which allows statistical description and comparison of groups. This method is highly appropriate in the non-experimental exploration in the research of special education.

Research Population

Undergraduate, graduate and postgraduate students with visual, hearing, learning, physical, and cognitive impairment enrolled in public and private universities in Punjab, Pakistan were the target population.

Sampling Technique

Simple random sampling was also used by using university registries of students with disabilities through computerized random number generation to provide all students with equal chances of selection, reduce chances of bias, and facilitate generalization.

Research Sample

The sample of the research included 200 students with disabilities of the public and private universities in Punjab, Pakistan, which reflected different groups of people such as gender, age groups, types of disability and level of education.

Research Tool

It was a structured 26-item Likert-scale questionnaire (1=Strongly Disagree to 5=Strongly Agree), which included items on reliability/fairness, accessibility/convenience, technical challenges, engagement/feedback and performance impact based on established inclusive assessment scales.

Validity and Reliability

Expert reviews of special education faculty satisfied content validity, exploratory factor analysis confirmed construct validity, and Cronbach's alpha calculated and deemed acceptable when determining internal consistency, and test-retest reliability was also established.

Cronbach's Alpha	No of Items	No. of Respondents
0.89	26	200

Data Collection

Over four weeks, data were obtained by distributing 220 questionnaires using online Google Forms and during face-to-face meetings at convenient university venues, which yielded 200 complete responses with information obtained without violating informed consent, anonymity, and ethical principles.

DATA ANALYSIS

Descriptive statistics (frequency, mean, standard deviation) and inferential ones (independent samples t-tests to compare binary variables (e.g., gender) and one-way ANOVA to compare multi-category factors (e.g., disability type) were performed with the help of SPSS version 26.

Demographic Analysis

Table 1: Frequency of the Demographic Information

Category	Respondents	Frequency (f)	Percentage (%)
Gender			
	Male	104	52%
	Female	96	48%
Age			
	18-21 years	90	45%

	22-25 years	60	30%
	26-30 years	30	15%
	Over 30 years	20	10%
Type of University			
	Public University	140	70%
	Private University	60	30%
Education Level			
	Undergraduate Student	80	40%
	Graduate Student	70	35%
	Postgraduate Student	50	25%
Type of Disability			
	Visual	40	20%
	Hearing	30	15%
	Learning	50	25%
	Physical	40	20%
	Cognitive	40	20%
Experience with Technology-Based Assessment			
	Yes	130	65%
	No	70	35%
Mode of Learning			
	In-person	60	30%
	Online	70	35%
	Blended	70	35%

Table 1 provides the demographic data indicating a balanced and heterogeneous sample of 200 students with disabilities, which is crucial to put the perceptions of assessment methods into perspective. There is almost an equal balance in gender (52% male, 48% female) and age is skewed towards the young with 45% of the population between the age of 18-21 years, which is characteristic of higher education enrollment in Pakistan. The most common are learning disabilities (25%), then visual, physical, and cognitive (20% each), and most of the universities included in the sample are state-funded (70%), which suggests more accessibility in these institutions. Technology based assessment experience is strong (65%), more probably due to COVID influence, and education and learning mode are evenly split, and will allow meaningful subgroup comparison in further analysis.

Descriptive Statistics

Table 2: Descriptive Statistics of Students' Perceptions on Traditional vs. Technology-Assisted Assessment Methods

Statements	Mean	S.D.
Section 2: Reliability and Fairness		
Traditional assessments accurately test my true knowledge and abilities.	3.45	0.85
Technology-assisted assessments ensure consistent scoring for all students.	3.52	0.82
Human bias is reduced in technology-based grading systems.	3.48	0.88

Marking criteria are applied consistently across both assessment types.	3.41	0.79
I trust that online assessment results are reliable and accurate.	3.39	0.86
	Average Mean = 3.45	
Section 3: Accessibility and Convenience		
Online assessments are more accessible than traditional paper tests.	4.05	0.78
I can easily use assistive tools (e.g., screen readers or speech-to-text) during digital exams.	4.02	0.81
Traditional exam formats present physical or time-related challenges for me.	3.98	0.84
Technology-based platforms are easy to navigate without extra assistance.	4.08	0.76
Flexible timing in online assessments helps reduce my test anxiety.	4.11	0.77
	Average Mean = 4.05	
Section 4: Technical and Resource Challenges		
Internet or device problems often interrupt my digital assessments.	3.12	0.91
My institution provides adequate technical support during online exams.	3.18	0.89
Unstable internet connections negatively impact my test performance.	3.09	0.93
I am confident using online platforms without external technical help.	3.22	0.87
Lack of specialized accessibility software limits my participation in digital assessments.	3.15	0.90
	Average Mean = 3.12	
Section 5: Engagement and Feedback		
Online assessments increase my motivation to perform well.	3.89	0.82
Immediate feedback from digital tests helps me identify my weaknesses.	3.92	0.80
Visual and multimedia elements in online assessments make learning enjoyable.	3.85	0.84
Traditional tests feel less engaging compared to technology-based formats.	3.88	0.81
Regular feedback from online systems helps me monitor my academic progress.	3.95	0.79
	Average Mean = 3.89	
Section 6: Impact on Performance		
I achieve better results in technology-assisted assessments.	3.67	0.79
Traditional exams allow deeper thinking and application of concepts.	3.45	0.85
Using digital platforms improves my confidence during tests.	3.72	0.77
Blended assessment approaches measure my ability more accurately.	3.68	0.81
Including multimedia content in tests improves my understanding and retention.	3.70	0.78
I am concerned about the privacy and security of data when use AI tools.	3.67	0.79
	Average Mean = 3.67	

Table 2 descriptive statistics shows that the perceptions of technology-assisted assessments among students with disabilities are moderately positive with the highest agreement in the accessibility / convenience (M=4.05, SD=0.78) and engagement / feedback (M=3.89, SD=0.82) indicating the high level of support to the idea of flexibility and motivational properties of digital tools. Since consistency and trust raise concerns, moderate endorsement is observed in reliability/fairness (M=3.45, SD=0.85) and performance impact (M=3.67, SD=0.79), although technical difficulties had lowest scores (M=3.12, SD=0.91) representing

neutrality or disagreement on infrastructure barriers. The subscales of low standard deviations indicate that there is a consensus in the response, and the assisted methods by technology are better in general when the technical problems are resolved.

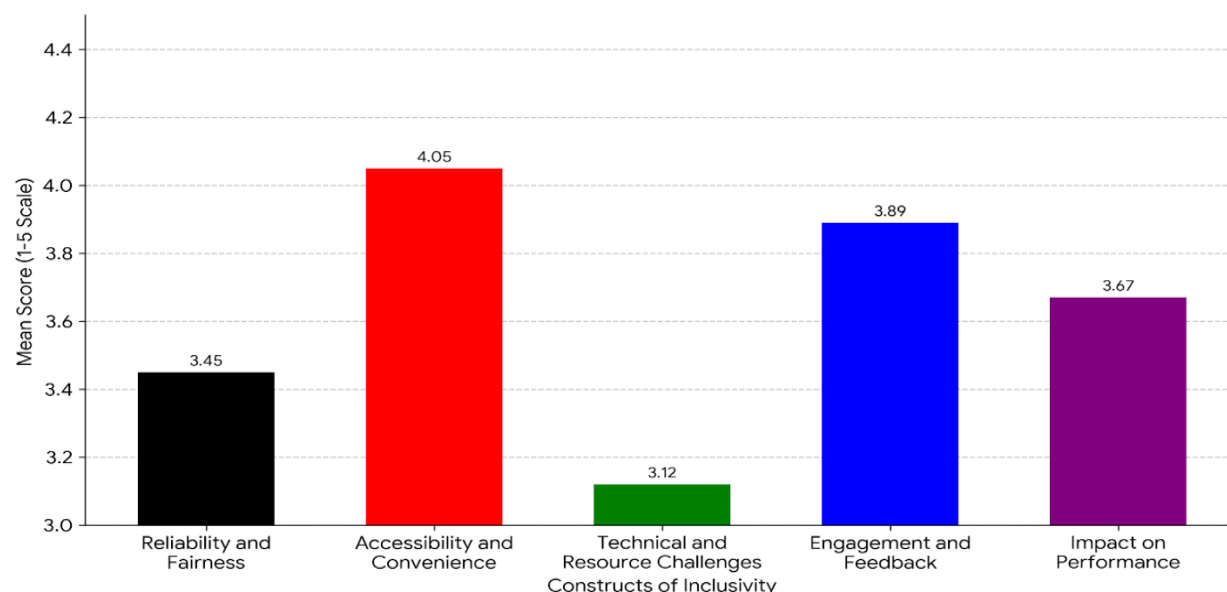**Graphical Representation of the Main Constructs**

Figure 2: Average Mean Scores of Main Constructs

Figure 2 shows a bar graph of the perceptions of the students on five main constructs on a 5-point Likert scale (1=Strongly Disagree, 5=Strongly Agree). Accessibility/Convenience was rated the highest (M=4.05), then Engagement/Feedback (M=3.89), and Performance Impact (M=3.67), which mean that the flexibility of technology-assisted assessments and motivational aspects were rated highly. Conversely, Technical Challenges had the lowest (M=3.12) score, and infrastructure barriers were mentioned, whereas Reliability/Fairness was moderate (M=3.45).

Inferential Statistics

Table 3: Independent Samples t-Test Results on Students' Perceptions by Gender, Type of University, and Technology Experience

	N	Mean	SD	t	df	Sig.
Gender						
Male	104	3.92	0.75	2.34	198	0.021
Female	96	4.18	0.80			
Type of University						
Public	130	4.02	0.76	3.12	198	0.002
Private	70	3.65	0.89			
Experience with Technology-Based Assessment						
Yes	140	3.48	0.83	1.45	198	0.149

No	60	3.38	0.88			

The results of independent samples t-test in Table 3 indicate a significant gender difference with females reported significantly more positive perceptions than males in accessibility in technology-assisted assessments. Type of university also varied significantly with students of public university reporting more positive views than that of the student of a private university. Technology experience differences were not significant implying that perceptions are consistent across technology experience. These trends highlight gender and institutional environment as significant in determining how the students prefer the digital mode of assessment.

Table 4: One-Way ANOVA Results

	Sum of Squares	df	Mean Square	F	Sig.
Age					
Between Groups	8.92	3	2.97	3.21	0.024
Within Groups	181.34	196	0.93		
Total	190.26	199			
Education Level					
Between Groups	6.45	2	3.23	2.89	0.058
Within Groups	219.67	197	1.11		
Total	226.12	199			
Type of Disability					
Between Groups	12.45	4	3.11	4.56	0.001
Within Groups	132.67	195	0.68		
Total	145.12	199			
Mode of Learning					
Between Groups	7.89	2	3.95	3.87	0.023
Within Groups	198.45	197	1.01		
Total	206.34	199			

The results of one-way ANOVA as shown in Table 4 show that there is a significant between-group difference in terms of age (p=0.024), disability type (p=0.001) and learning mode (p=0.023), which indicates that these demographic factors play an important role in moderating the differences that how students perceive traditional and technology-assisted assessments. The disability type is the most variable, showing that students with visual, hearing, learning, physical impairment, and cognitive disability have different accessibility and technical difficulties in digital format. The preference of younger students, and students in a blended/online mode of learning, towards technology-assisted approaches over older students and the differences in education levels are moving towards significance (p=0.058). These results demonstrate the significance of specific assessment-related accommodations that would target demographically specific barriers.

Findings

According to the results of this comparative research, students with disabilities in Pakistani institutions of higher education tend to view technology-assisted assessments more positively than paper-based assessments on most of the critical dimensions. The descriptive statistics reflects moderately positive perceptions in general, with the highest level of agreement with aspects such as accessibility and convenience (M=4.05, SD=0.78), with participants strongly supporting such characteristics as screen

readers, speech-to-text, flexibility in timing, and ease in navigation, which address physical and time-related barriers that are inherent in traditional exams. Interaction and feedback were also rated at a high level (M=3.89, SD=0.82), and digital versions were said to increase motivation due to immediate feedback, multimedia, and progress monitoring, as opposed to the less interactive quality of the traditional tests.

Perception of reliability and fairness were moderate (M=3.45, SD=0.85), where confidence was held in the consistency of scoring with technology and less biasness on human and reduced biasness on accuracy was voiced in both approaches. It was followed by performance impact (M=3.67, SD=0.79), where students reported improved performance and confidence through digital platforms, but considered traditional exams to be more valuable when using them in a deeper application. The weakest area was technical issues (M=3.12, SD=0.91), where often the issues of unstable internet, insufficient device support, and lack of institutional help were observed, which indicates the presence of infrastructure gaps.

Demographic influences were also shed some light by inferential analysis. Gender differences were significant, independent t-tests indicated the female of greater benefits as compared to the male (M=4.18 versus M=3.92), and the student in the public universities had higher overall positivity than their counterparts in the private universities (M=4.02 versus 3.65). A one-way ANOVA indicated age (F=3.21, p=0.024) and disability type (F=4.56, p=0.001) differences between visual and learning disabilities, with the blended/online learners having the highest preference towards technology. These findings propose specific policy changes such as the improvement of technical infrastructure, disability-specific settings, and training of teachers so that the inclusive potential of technology can be the most, and the equity barriers can be overcome.

DISCUSSIONS

The results indicate that students with disabilities in Pakistani higher education establishments have a more positive attitude towards the application of technology in assessment tools in comparison to the traditional methods, especially with regard to access and interaction. Accessibility (M=4.05) and engagement (M=3.89) mean scores are high which is also consistent with literature that has highlighted the flexibility of digital tools (screen readers and speech-to-text) to overcome physical and time constraints inherent in paper-based tests (Pang & Datu, 2025; Lancioni et al., 2023). Moderate scores on reliability (M=3.45) imply the belief in the stability of scoring, but it brings up the persistent issues of the reduction of human bias and accuracy (Dumitru et al., 2024).

The higher accessibility ratings are based on such characteristics as flexible timing and aids to accommodate the multiple needs of disabilities, which was more effectively provided compared to the rigid traditional format (Khasawneh & Ahmad, 2024; Pradhan & Gochhayat, 2023). The inferential tests demonstrate that there is substantial gender (females have higher, t=2.34, p=0.021), disability (F=4.56, p=0.001), and institution type (public higher, t=3.12, p=0.002) differences, meaning that perceptions are moderated by contextual influences, such as infrastructure (Olakanmi et al., 2020; Miller, 2025). Technical (M=3.12) challenges highlight the distance between infrastructure that mirrors the world-wide worries in developing situations where connectivity interferes with equity (Kalemkuş, 2025; Tariq & Sergio, 2025).

The findings are the first of their kind and build on previous reviews (empirical comparison in a Global South higher education institution) in addition to the fact that technology is more effective at motivating through instant feedback than traditional methods (Pang & Datu, 2025; Lancioni et al., 2023; Aftab et al., 2025). In contrast to larger research on instruction, it is concerned with assessment, which proves the potential of digital tools in improving performance (M=3.67) in case such barriers as algorithmic bias is avoided (Dumitru et al., 2024; Khasawneh & Ahmad, 2024). Local equivalences in Pakistan ratify policy-

infrastructure divorces, justifying demands of universal design (Pradhan & Gochhayat, 2023; Black & de Pablos-Ortega, 2025).

Teachers must focus on blended tests with disability-based modifications to make use of the advantages of technology and still have the depth of thought needed in intricate thinking tasks. The institutions will have to invest in technical support and training, particularly those related to the private universities and older students who exhibit reduced endorsement (Sugiyama et al., 2025; Kalemkuş, 2025). These perceptions can guide policymakers in reformation of guidelines, including AI ethics and equity in order to avoid misrepresentation of abilities (Pang & Datu, 2025; Pradhan & Gochhayat, 2023).

Self-reported information can be biased and the sample which is concentrated on Punjab cannot be extrapolated to other parts of Pakistan. The use of longitudinal designs, mixed methods, or experimental comparisons in a larger number of regions would help confirm causality in future studies (Lancioni et al., 2023; Dumitru et al., 2024).

CONCLUSION

Finally, this paper has established that the Pakistani higher education students with disabilities find tech-based assessment is more acceptable than traditional assessment especially in terms of greater accessibility, interaction, and performance despite their moderate reliability perceptions and technical inhibitions. These results, along with demographic differences (gender, disability type) demonstrate the necessity of infrastructure enhancement, teacher education, and non-discriminatory policies in accordance with the universal design concept. Finally, considerate use of assistive technologies can result in the promotion of equitable practices during assessment, which can enable disabled students and inform future reforms in developing settings.

RECOMMENDATIONS

1. To reduce the impediment of technology-assisted assessments of students with disabilities, institutions must invest in good infrastructure such as quality internet, support software such as screen readers and speech-to-text, and support personnel.
2. To improve equity and performance, policy makers and educators need to come up with inclusive policies that encourage universal design, teacher education on accommodations, and blend assessment models depending on the type of disability, gender, and institutional settings.

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