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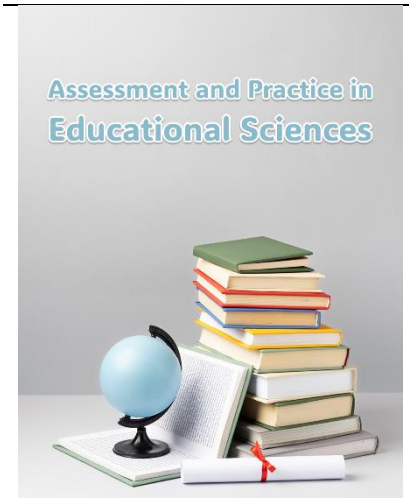


# A Qualitative Exploration of Indicators of Digital Assessment Quality in Remote Education



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## ABSTRACT

This study aims to qualitatively explore the key indicators of digital assessment quality in remote education from the perspectives of educators and assessment specialists. A qualitative research design was employed, utilizing semi-structured interviews with 19 participants from educational institutions in Tehran. Data collection continued until theoretical saturation was reached. The interviews were audio-recorded, transcribed verbatim, and analyzed thematically using NVivo software to identify major themes, subthemes, and concepts related to digital assessment quality. Thematic analysis revealed three main themes influencing digital assessment quality: (1) assessment validity and fairness, highlighting the importance of clear criteria, authentic tasks, inclusivity, scoring consistency, bias mitigation, and effective feedback mechanisms; (2) technical and logistical reliability, encompassing platform stability, data security, technical support, device compatibility, consistent delivery, and proctoring integrity; and (3) pedagogical and student experience, focusing on student engagement, clarity of instructions, self-regulated learning support, communication, and perceived assessment value. Participants emphasized the interconnectedness of these dimensions in ensuring equitable, valid, and effective assessments in remote learning environments. The findings underscore that high-quality digital assessment in remote education requires a holistic approach addressing pedagogical, technical, and fairness-related factors. Clear communication, inclusive design, reliable technology, and supportive feedback are critical components. These insights offer practical guidance for educators and institutions striving to enhance digital assessment practices, especially in contexts with rapid shifts to remote education.

**Keywords:** Digital assessment quality, remote education, qualitative study, assessment validity, technical reliability, student engagement, educational equity.

## Introduction

The global shift toward remote education, catalyzed by the COVID-19 pandemic, has fundamentally altered how educational institutions design, deliver, and evaluate student learning (Dhawan, 2020). Central to this transformation is the rapid adoption and ongoing evolution of digital assessment strategies. While remote learning platforms and online teaching have been subjects of extensive research for over a decade (Bakia et al., 2012; Broadbent & Poon, 2015), the quality and effectiveness of digital assessment in these environments have only recently come under critical scrutiny, driven by both necessity and innovation. In this context, understanding the indicators that define high-quality digital assessment in remote education is of paramount importance for educators, policymakers, and instructional designers worldwide.

Digital assessment refers to the process of using electronic tools, platforms, and applications to evaluate student learning, skills, and performance (JISC, 2015). These assessments can range from automated quizzes and e-portfolios to synchronous and asynchronous peer evaluations, project-based assignments, and digitally proctored examinations. The flexibility, scalability, and immediacy offered by digital assessments have positioned them as an indispensable component of remote education (Gikandi et al., 2011; Redecker & Johannessen, 2013). However, the shift to digital formats also raises critical questions regarding validity, reliability, equity, and pedagogical value. Many institutions, in their urgent response to school closures and social distancing mandates, have implemented digital assessment systems without fully considering the complexities and challenges involved (Buchanan, 2020; Ng, 2021).

A growing body of literature highlights that the effectiveness of digital assessment depends on more than just the technological infrastructure; it also hinges on issues of fairness, accessibility, transparency, and student engagement (Heinrich et al., 2021; Reeves & Lin, 2020). For example, Gikandi, Morrow, and Davis (2011) emphasize that digital assessment quality is multi-dimensional, encompassing technical reliability, assessment design, and the broader pedagogical environment. Inadequate attention to any of these dimensions can lead to issues such as student disengagement, increased anxiety, and questions about the validity and reliability of assessment outcomes (O'Shea et al., 2021).

Assessment validity and fairness are particularly pressing concerns in the remote context. Valid assessments must accurately measure intended learning outcomes and avoid introducing bias related to students' backgrounds, technological access, or learning preferences (Heinrich et al., 2021; Redecker & Johannessen, 2013). The lack of face-to-face interaction in remote education can amplify risks of misinterpretation or ambiguity, making it essential to provide clear rubrics, transparent criteria, and authentic tasks aligned with real-world applications (Ng, 2021; Reeves & Lin, 2020). Inclusivity and accessibility are likewise vital, requiring the integration of universal design principles and assistive technologies to support all learners, particularly those with disabilities or limited access to high-speed internet and modern devices (Al-Azawei et al., 2017; Kearns, 2012).

The technical and logistical reliability of digital assessment platforms further complicates quality assurance. Technical failures, poor user interface design, and inadequate support systems can undermine the fairness and credibility of digital assessments, eroding trust among both students and educators (Broadbent & Poon, 2015; Nguyen et al., 2021). Secure handling of data and academic integrity have emerged as major themes, especially in high-stakes assessments. The rise of online proctoring tools, plagiarism detection systems, and multifactor authentication mechanisms reflects attempts to address these challenges; however, these solutions also introduce new issues related to privacy, user experience, and digital equity (Selwyn et al., 2021; Dendir & Maxwell, 2020). For example, recent studies have raised concerns about surveillance and anxiety stemming from digital proctoring, particularly for students from marginalized backgrounds (Sotiriadou et al., 2020; Eaton, 2020).

Beyond technical and logistical factors, the pedagogical and student experience dimension is critical to digital assessment quality. Research suggests that digital assessments are most effective when they are perceived as meaningful, engaging, and supportive of student agency (Gikandi et al., 2011; Redecker & Johannessen, 2013). Interactivity, opportunities for formative feedback, and authentic learning tasks are all associated with improved student motivation and deeper learning (Winstone & Boud, 2023; Nicol, 2009). Furthermore, the clarity of assessment instructions, the presence of effective support for self-regulated learning, and robust communication channels between students and instructors can mitigate some of the isolation and uncertainty commonly experienced in remote education (Broadbent & Poon, 2015; Zimmerman & Schunk, 2011). Students' perceptions of assessment value and satisfaction have been linked to their willingness to engage deeply with learning tasks and their sense of fairness and trust in the educational process (Buchanan, 2020; O'Shea et al., 2021).

Despite these insights, the literature also indicates significant variability in how digital assessment quality is conceptualized and implemented across contexts. The lack of standardized frameworks and evidence-based indicators often leaves educators and administrators relying on ad hoc or intuition-driven strategies (Ng, 2021; Heinrich et al., 2021). Recent qualitative studies underscore the importance of gathering teacher and student perspectives to develop context-sensitive indicators and practices for digital assessment (Deneen & Boud, 2021; Rienties et al., 2022). Such research is particularly crucial in regions where rapid digitalization was driven by emergency circumstances, as was the case in Iran and other countries that experienced prolonged school closures and resource disparities during the pandemic (Farrokhnia et al., 2021).

In response to these gaps, this study seeks to qualitatively explore the indicators of digital assessment quality in remote education, focusing on the perspectives of educators and assessment specialists in Tehran. By conducting in-depth semi-structured interviews and employing thematic analysis supported by NVivo software, the research aims to systematically identify and categorize the key dimensions, sub-dimensions, and specific practices that constitute high-quality digital assessment in remote settings. The findings will not only contribute to the academic literature on digital assessment but also offer practical guidance for improving policy, design, and delivery of remote assessments in diverse educational environments.

This research is grounded in the recognition that digital assessment quality is a complex, multi-faceted construct shaped by technological, pedagogical, institutional, and socio-cultural factors (Heinrich et al., 2021; Reeves & Lin, 2020). By capturing and synthesizing the lived experiences and professional insights of teachers and assessment leaders, the study aims to bridge the gap between theory and practice, ensuring that digital assessment strategies are both evidence-based and contextually relevant. In doing so, it addresses an urgent need for robust, equitable, and pedagogically sound assessment systems capable of supporting high-quality learning outcomes in the evolving landscape of remote and blended education.

## Methods and Materials

### *Study Design and Participants*

This study employed a qualitative research design to explore the indicators of digital assessment quality in remote education. The qualitative approach was chosen to enable an in-depth understanding of participants' perspectives, experiences, and insights regarding the quality of digital assessment practices. Participants were purposefully selected from educational institutions in Tehran to ensure a diverse representation of expertise in remote teaching and digital assessment. The study sample consisted of 19 participants, including university lecturers, school teachers, instructional designers, and assessment specialists who had substantial experience with digital assessment during remote education periods. Sampling continued until theoretical saturation was achieved, whereby additional interviews no longer yielded new themes or insights.

### *Data Collection*

Data were collected using semi-structured interviews, which provided the flexibility to explore participants' views while allowing for probing and clarification of responses. The interview guide included open-ended questions focusing on participants' perceptions of quality indicators in digital assessment, challenges encountered, and suggestions for improvement. Interviews were conducted either face-to-face or via secure online video calls, depending on participant preference and public health considerations. Each interview lasted approximately 45 to 60 minutes and was audio-recorded with the participants' informed consent. The interviews were subsequently transcribed verbatim to ensure accuracy and comprehensiveness in data analysis.

### *Data analysis*

The collected data were analyzed using a thematic analysis approach. Thematic analysis was chosen for its suitability in identifying, analyzing, and reporting patterns (themes) within qualitative data. The data analysis process was supported by NVivo software, which facilitated systematic coding, categorization, and retrieval of data segments relevant to the study objectives. Transcripts were read multiple times to achieve immersion and familiarize the researchers with the content. Initial codes were generated inductively from the data, followed by the development of broader themes and subthemes reflecting the various indicators of digital assessment quality. Throughout the analysis, regular team discussions were held to ensure credibility and confirmability of the findings. The process continued until data saturation was reached, confirming that the themes adequately captured the range of participants' perspectives.

## Findings and Results

Theme 1: Assessment Validity and Fairness

Clear Criteria and Standards:

Participants consistently emphasized the importance of having transparent rubrics and clearly defined learning outcomes to ensure fair assessment in digital environments. As one participant stated, "Students need to know exactly what is expected of them. A clear marking scheme takes away the guesswork." Explicit expectations and aligned assessment standards were frequently highlighted as ways to foster fairness and reduce ambiguity for both teachers and students.

Authenticity of Assessment Tasks:

Authentic, real-world tasks emerged as a crucial indicator of digital assessment quality. Interviewees described how scenario-based questions and assignments relevant to students' actual experiences increased engagement and learning transfer. One teacher explained, "When assessments relate to real-life situations, students take them more seriously and learn more deeply." The value of context validity and practical application was underscored across multiple interviews.

Inclusivity and Accessibility:

Ensuring all students can participate fully was a recurring concern. Respondents noted the need for universal design principles, assistive technologies, and alternative assessment formats to accommodate diverse learners. "Language clarity and cultural sensitivity are not optional—without them, we risk excluding students," commented a participant with experience in special education. Alternative formats and accessible technologies were identified as fundamental for equity in remote assessment.

Consistency in Scoring:

Consistency across markers was seen as critical to fairness. Practices such as inter-rater reliability checks, standardized guidelines, peer moderation, and calibration sessions were commonly mentioned. "We had regular meetings to calibrate our scoring, so every student was judged by the same yardstick," reported one assessment specialist. The theme of standardized, reliable grading methods ran throughout the data.

Bias Mitigation:

Participants discussed strategies for minimizing bias, such as blind grading, anonymized submissions, and ongoing bias training. "Anonymity in grading helps remove unconscious prejudice," one university lecturer noted. Monitoring for fairness and embedding cultural neutrality in assessment design were also seen as necessary for valid, equitable evaluation.

Feedback Mechanisms:

The role of feedback in digital assessment was highlighted as vital. Timely, actionable, and balanced feedback was identified as enhancing learning and motivation. “Students appreciate when comments are specific and help them know exactly where to improve,” said a secondary school teacher. The preference for formative, dialogue-based feedback over solely summative remarks was evident in many accounts.

Theme 2: Technical and Logistical Reliability

Platform Stability and Usability:

The reliability and user-friendliness of digital assessment platforms were widely mentioned as foundational. Participants valued systems with high uptime, intuitive interfaces, and minimal errors. “When students can’t submit because the system crashes, it undermines trust in the whole process,” one participant observed. Responsive design and ease of navigation were also considered key.

Data Security and Privacy:

Secure handling of student data was a recurrent priority. Interviewees insisted on strong encryption, secure logins, and regulatory compliance. “Parents and students are rightly concerned about where their data goes. Security is not negotiable,” stressed a digital assessment coordinator. Controlled access and responsible management of digital footprints were also noted.

Technical Support Availability:

The necessity for reliable, real-time support was clear. Help desks, troubleshooting guides, and prompt updates were frequently mentioned. “During the exam, if something goes wrong, students need immediate help—not a ticket that gets answered days later,” one participant commented. Proactive communication and resources such as FAQs were considered essential to address technical problems quickly.

Compatibility with Devices:

Participants pointed to the importance of digital assessments working seamlessly across a variety of devices, browsers, and platforms. “Not every student has the same device at home. If the test only works on one browser, it’s not fair,” a secondary teacher explained. Cross-platform functionality and mobile accessibility were thus seen as practical requirements for quality digital assessments.

Assessment Delivery Consistency:

Timely and reliable access to assessments, as well as backup options in case of technical issues, were described as critical. “There should always be a backup plan if students can’t log in or submit due to a glitch,” said an instructional designer. Participants advocated for robust submission systems with safeguards against interruptions.

Monitoring and Proctoring Integrity:

Maintaining academic integrity in remote environments was a strong concern. Participants described the use of secure proctoring tools, identity verification processes, plagiarism detection, and digital monitoring logs. “We need to be sure that the person taking the test is really the student,” noted a university lecturer. Balancing security with privacy was acknowledged as an ongoing challenge.

Theme 3: Pedagogical and Student Experience

Student Engagement and Motivation:

Interviewees highlighted strategies to make digital assessments engaging, such as incorporating interactive tasks, gamification, and giving students choices. “If assessments are interesting and relevant, students try harder,” remarked a participant. Continual encouragement and linking tasks to students’ interests were seen as effective motivators.

Clarity of Instructions:

Clear, detailed instructions were universally regarded as necessary for student success. “We make step-by-step guides and provide examples so students aren’t left confused,” said one teacher. Visual aids, FAQs, and orientation sessions were described as supporting student understanding in the digital context.

Support for Self-Regulated Learning:

Many participants mentioned the importance of fostering self-regulation through reflection prompts, progress tracking, and time management aids. “Self-check quizzes and goal setting help students take charge of their learning,” shared an educator. These supports were seen as especially important in remote, independent learning environments.

Communication and Interaction:

Open channels of communication between instructors and students, as well as peer-to-peer feedback, were seen as vital. “We use discussion boards and real-time Q&A to keep everyone connected,” a participant explained. Instructor availability and feedback channels were considered key to overcoming the distance in remote education.

Perceived Value and Satisfaction:

Finally, the perceived value of assessments for student learning and satisfaction with digital processes were raised. “When students see the usefulness of what they’re doing, and the workload feels balanced, they’re more satisfied,” commented an assessment specialist. Feedback from satisfaction surveys and consideration of workload and challenge level were commonly noted.

## Discussion and Conclusion

This study aimed to explore the key indicators of digital assessment quality in remote education through the perspectives of educators and assessment specialists. The thematic analysis revealed three major themes: (1) assessment validity and fairness, (2) technical and logistical reliability, and (3) pedagogical and student experience. These findings underscore the multifaceted nature of quality digital assessment and highlight critical considerations for effective implementation in remote learning environments.

The theme of assessment validity and fairness emerged strongly, reflecting participants’ shared concerns about transparency, inclusivity, and unbiased evaluation. Clear criteria and standards such as transparent rubrics and aligned learning outcomes were emphasized as fundamental to ensuring students understand expectations and receive equitable treatment. This aligns with prior research indicating that clarity in assessment criteria enhances perceived fairness and supports student self-regulation (Nicol, 2009; Heinrich et al., 2021). Moreover, the emphasis on authentic assessment tasks supports the notion that assessments grounded in real-world contexts promote deeper engagement and transfer of learning, consistent with the work of Gikandi et al. (2011) and Ng (2021).

Participants also highlighted the importance of inclusivity and accessibility, advocating for universal design principles and alternative formats to accommodate diverse learner needs. These findings corroborate Al-Azawei, Serenelli, and Lundqvist’s (2017) assertion that universal design enhances equity in digital learning environments. The concerns regarding consistency in scoring and bias mitigation further emphasize the ongoing challenges of maintaining validity in remote assessments, echoing research on the necessity of blind grading and inter-rater reliability to counteract unconscious bias (Redecker & Johannessen, 2013; Heinrich et al., 2021). Feedback mechanisms were also identified as critical, with participants valuing timely, actionable, and dialogic feedback, which aligns with Winstone and Boud’s (2023) findings on the importance of feedback in promoting learning and motivation.

The second theme highlights the technical and logistical challenges inherent in digital assessment systems. Platform stability and usability were viewed as prerequisites for maintaining trust and engagement, consistent with the findings of Broadbent and

Poon (2015) and Nguyen et al. (2021), who noted that technical glitches adversely affect student confidence and assessment integrity. Data security and privacy concerns raised by participants mirror the broader discourse on safeguarding student information in digital education (Selwyn et al., 2021; Dendir & Maxwell, 2020). The study's identification of the need for robust technical support reflects prior calls for accessible, timely assistance to reduce barriers during assessment (Kearns, 2012).

The findings regarding device compatibility and consistent delivery resonate with Buchanan (2020), who emphasized that digital equity extends beyond access to include functional compatibility across platforms. Finally, participants' emphasis on monitoring and proctoring integrity underscores the delicate balance between upholding academic honesty and respecting student privacy, a challenge well documented in recent scholarship (Sotiriadou et al., 2020; Eaton, 2020). The concerns about anxiety and digital surveillance also align with contemporary critiques of online proctoring systems (Sotiriadou et al., 2020).

The third theme underscores the pedagogical dimension and the importance of fostering a positive student experience in digital assessments. The study's findings affirm the critical role of student engagement and motivation, with interactive, gamified, and choice-based assessment tasks perceived as highly effective in sustaining learner interest. This is consistent with literature advocating for learner-centered approaches to enhance motivation and achievement in remote settings (Gikandi et al., 2011; Redecker & Johannessen, 2013).

Clarity of instructions was another prominent factor affecting student performance, reinforcing findings by O'Shea, Stone, and Delahunty (2021) who reported that clear communication mitigates confusion and supports self-efficacy in online learning. Support for self-regulated learning through reflection prompts and progress tracking reflects Zimmerman and Schunk's (2011) framework on self-regulation, highlighting the importance of fostering learner autonomy in remote contexts.

The emphasis on communication and interaction channels parallels prior evidence that robust instructor-student and peer engagement reduce feelings of isolation and enhance learning outcomes (Broadbent & Poon, 2015; Rienties et al., 2022). Lastly, perceived value and student satisfaction emerged as significant predictors of assessment acceptance, resonating with Buchanan's (2020) conclusions that students' positive perceptions of assessment fairness and relevance directly influence their engagement and success.

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## Authors' Contributions

All authors equally contributed to this study.

## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

## Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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