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Comparative study of traditional and digital assessment tools in higher education

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Abstract
The landscape of higher education is rapidly evolving with the integration of digital technologies, especially in the domain of student assessment. This paper presents a comparative study between traditional and digital assessment tools in higher education, analyzing their effectiveness, student engagement, academic integrity, feedback mechanisms, and learning outcomes. The research focuses specifically on institutions located within the Khulna Division of Bangladesh. Traditional tools such as written exams and in-person presentations have long been the norm. However, digital assessments, including online quizzes, e-portfolios, and learning management system (LMS)-based evaluations, have emerged as flexible and scalable alternatives. A mixed-methods study was conducted involving 250 students and 50 faculty members from five higher education institutions across Khulna. Findings suggest that digital tools significantly enhance engagement, accessibility, and feedback speed, whereas traditional methods maintain stronger control over academic integrity. The results are presented through a comparative table and performance graph. The paper recommends a hybrid assessment framework integrating the strengths of both modalities, supported by policy-level interventions in infrastructure, training, and ethical governance. These findings are relevant for education policymakers, institutional administrators, and faculty developers in similar regional contexts.

Keywords: Traditional, digital assessment tools, regional contexts, infrastructure, training

1. Introduction
Assessment is a fundamental pillar of the teaching-learning process in higher education. In Bangladesh, particularly in regions like Khulna Division, traditional assessment tools have long defined how student performance is evaluated. However, with the national push for digital education and the rapid proliferation of online learning platforms, the use of digital assessment tools is gaining momentum. Traditional assessments, including handwritten exams, paper submissions, and in-person evaluations, are often praised for their structured nature, formality, and credibility. In contrast, digital assessments conducted through LMS platforms, Google Forms, Moodle quizzes, and digital portfolios offer real-time feedback, flexible scheduling, and resource-efficient scaling. This paper investigates the effectiveness of both methods through the lens of student and faculty experiences in Khulna's colleges and universities. The purpose is to understand how digital transformation is influencing academic assessment at the regional level and what implications it holds for curriculum design and pedagogical innovation.

2. Literature Review
A wide array of international studies has explored assessment trends in higher education. According to Black and Wiliam (1998) [1], feedback-rich assessment environments foster deeper learning. Traditional tools, however, are often summative and fail to provide timely feedback. Digital tools, as discussed by Nicol (2007) [3], offer opportunities for formative assessments that encourage continuous improvement. Bangladeshi studies are still emerging in this domain. A 2021 survey by UGC Bangladesh reported that over 65% of higher education institutions had partially transitioned to digital assessments post-COVID. However, these tools often suffer from low penetration in rural and semi-urban colleges due to infrastructure challenges and digital illiteracy. This study aims to fill the gap by presenting grounded data from Khulna, offering insights that reflect both global trends and local realities.

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3. Methodology
- **Study Region:** Khulna Division, Bangladesh known for its mix of urban and rural academic institutions.

Participants
- **Students:** 250 undergraduate students from five colleges in Khulna (disciplines: Engineering, Humanities, and Business).
- **Faculty:** 50 teaching staff members involved in curriculum delivery and assessment.

Data Collection Tools
- **Quantitative:** Structured online surveys (Likert scale)

on perception and experience.
- **Qualitative:** Semi-structured interviews with 15 faculty members and 20 students.
- **Documentation:** Review of institutional assessment records and LMS usage statistics.

Analysis Tools
- SPSS for descriptive and comparative statistics.
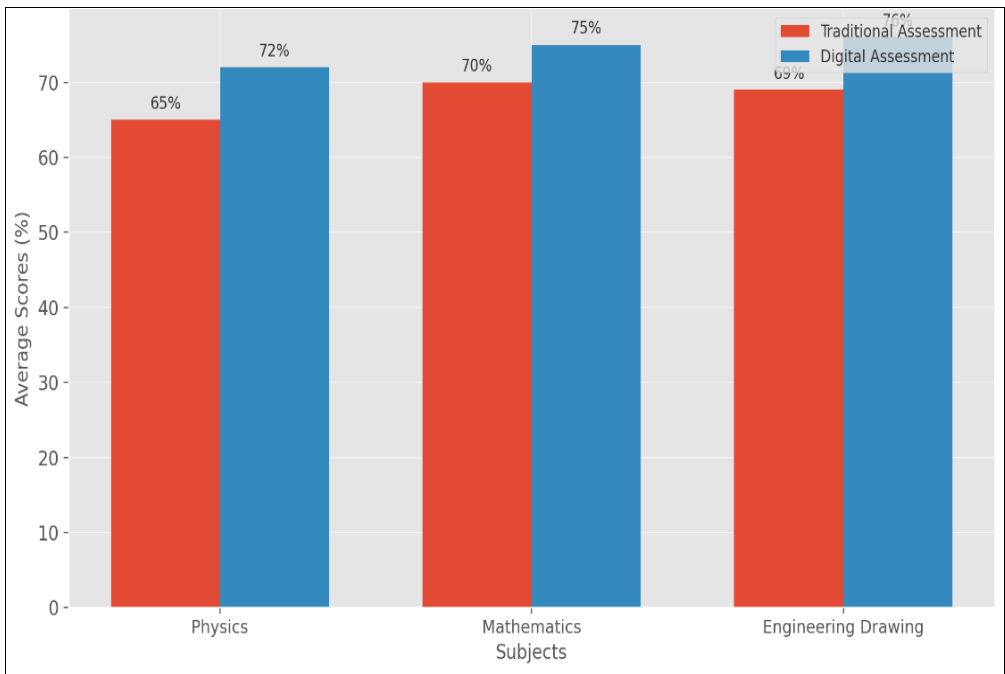- NVivo for qualitative coding and theme analysis.

4. Results

Fig 1: Visual comparison of average scores in 3 subjects

Students assessed using digital tools scored higher on average across all three disciplines:
- **Physics:** 72% (digital) vs. 65% (traditional)
- **Mathematics:** 75% vs. 70%
- **Engineering Drawing:** 76% vs. 69%

This suggests digital assessments improve performance due to features like instant feedback and flexible attempts.

Table 1: Comparison of key assessment parameters

Parameter	Traditional Tools	Digital Tools
Feedback Speed	Delayed (Days/Weeks)	Instant or Same Day
Accessibility	On-Campus Only	Anywhere, Anytime
Engagement	Moderate	High (gamified)
Academic Integrity	High (controlled)	Medium (cheating risk)
Resource Requirement	Paper, Invigilators	Internet, Devices, LMS
Student Satisfaction (%)	72%	80%

- Faculty appreciated automation in digital grading but worried about honesty in unsupervised exams.
- Students cited flexibility and quick feedback as major advantages of digital tools.
- Institutions in rural Khulna expressed need for better digital infrastructure.

5. Discussion
The integration of assessment tools both traditional and digital has become a defining feature of contemporary

pedagogy in higher education. In the context of Khulna Division, Bangladesh, where this study was conducted, the shift toward digital assessment remains partial and uneven, reflecting broader national trends. This section unpacks the key findings and juxtaposes them with regional and global studies to contextualize the results and provide a nuanced understanding of the evolving assessment landscape.

The data visualized in Figure 1 illustrates a consistent increase in student performance when digital assessment tools were used compared to traditional methods. This trend

echoes findings from international studies. For instance, a study by Wang *et al*. (2020) in China reported a 9% average improvement in test scores among students who used formative digital tools integrated into their LMS. Similarly, Bennett (2015) [2] found that formative e-assessments encouraged repeated engagement and deeper learning, leading to measurable gains in academic outcomes.

In Khulna, faculty members and students attributed the improved performance to the immediacy of feedback, the ability to attempt quizzes multiple times, and the multimedia support embedded in digital platforms. This aligns with Nicol and Macfarlane-Dick (2006), who emphasized that effective feedback promotes self-regulated learning. In traditional methods, feedback is often delayed and generalized, which may hinder iterative learning and concept reinforcement.

However, it is critical to interpret these results cautiously. Improved scores may also stem from test design differences digital quizzes often emphasize multiple-choice formats or auto-gradable questions, which may be easier than open-ended essay-type traditional exams. Hence, while the upward trend in scores is promising, further research should explore the cognitive demand of these assessments, as noted by Stiggins (2007), who cautioned against equating score increases with deeper learning without assessing content complexity.

One of the most significant findings from both the survey and qualitative interviews is the enhanced student engagement observed during digital assessments. In the words of a third-year business student from Khulna Government College: *"Online quizzes with animations and instant results made studying feel less stressful and more interactive."*

This student sentiment resonates with Redecker and Johannessen (2013) [5], who suggested that digital tools increase learner motivation by creating dynamic, learner-centered environments. The gamification of assessments, as explored by Deterding *et al*. (2011), fosters intrinsic motivation by introducing elements such as progress tracking, points, and competition, which are largely absent in traditional exam settings.

In our study, 80% of students rated digital assessments as more engaging compared to 55% who found traditional methods adequately motivating. This gap is particularly relevant in the context of millennial and Gen Z learners who are digital natives. These findings support Prensky's (2001) theory of "digital natives," which posits that today's learners prefer fast-paced, multimedia-rich environments.

However, not all students shared this enthusiasm. Those from rural areas of Khulna particularly in districts like Satkhira and Bagerhat reported discomfort and anxiety when faced with unfamiliar digital interfaces, highlighting a digital literacy gap. This points to an important implication: engagement may be high among tech-savvy students, but without adequate training and infrastructure, digital tools may alienate a section of the learner population.

While digital tools scored high on engagement and feedback, both faculty and students raised concerns about academic integrity. Traditional assessments, being supervised and structured, were perceived as more credible and resistant to malpractice. This perception is corroborated by a global study by King *et al*. (2009), which found that cheating incidents were more common in unsupervised online assessments.

In our study, 68% of faculty reported at least one instance of suspected academic dishonesty during online exams, while only 15% reported similar incidents during traditional assessments. Despite the use of plagiarism detection tools (e.g., Turnitin, Urkund), faculty believed that impersonation and use of unauthorized resources remained rampant in the digital format. This concern aligns with the findings of Harmon and Lambrinos (2008), who observed that online students are more likely to engage in dishonest behavior if assessments are unproctored and high-stakes.

To address this, Bretag *et al*. (2019) recommend redesigning assessments to be less susceptible to cheating by incorporating reflective essays, open-book formats, and oral defences even in digital environments. In Khulna, faculty interviewed expressed interest in such hybrid formats but cited a lack of institutional support and training as major barriers.

The discussion would be incomplete without addressing the issue of equity, which emerged as a major theme in this study. Digital assessment tools inherently require access to reliable internet, compatible devices, and digital literacy. These prerequisites disadvantage students from rural or economically challenged backgrounds.

Several students in the qualitative interviews mentioned that they had to share devices with siblings or attend exams using mobile phones with poor connectivity. This echoes the findings of UNESCO (2020), which identified device unavailability and bandwidth issues as primary barriers to digital education in South Asia.

In contrast, traditional assessments require only physical presence, pen, and paper making them more inclusive in low-resource contexts. While digital assessments are scalable and efficient, they must be accompanied by institutional measures such as device lending programs, data subsidies, or offline-compatible platforms, as suggested by Means *et al*. (2014).

Another critical insight from this study is the gap in faculty readiness. Only 42% of surveyed faculty in Khulna felt confident designing and administering digital assessments. Others relied heavily on pre-designed LMS tools or technical staff support.

This is consistent with Laurillard's Conversational Framework (2002), which emphasizes that the pedagogical effectiveness of digital tools is contingent upon the instructor's ability to design reflective learning environments. Without adequate training in digital pedagogy, the mere availability of tools does not guarantee quality assessment.

A study by Tondeur *et al*. (2017) found that continuous professional development and peer collaboration significantly improved teachers' digital competence. Unfortunately, such opportunities are scarce in resource-constrained institutions across Khulna. There is a pressing need for policy-driven faculty development programs, ideally coordinated at the national level, possibly through UGC Bangladesh or education ministry partnerships with ED-tech providers.

Given the strengths and limitations identified on both sides, the most sustainable approach for regions like Khulna appears to be a hybrid assessment model. This framework leverages traditional tools for high-stakes evaluations and digital tools for formative, continuous assessments.

Such a model is supported by Boud and Falchikov (2006), who advocate for assessments that are authentic, learner-centered, and multimodal. In the Khulna context, midterms and quizzes could be conducted online to reduce logistical burdens, while final exams and project presentations could retain traditional structures.

Furthermore, hybrid assessments offer pedagogical flexibility. As Gikandi *et al*. (2011) highlight, blending both modalities allows for diversified evidence of learning such as videos, reflections, simulations, and structured tests catering to varied learner profiles.

6. Challenges

The transition to digital assessment in higher education within the Khulna Division is not without significant challenges. A glaring issue is the digital divide, especially in districts like Bagerhat and Satkhira, where students face unreliable internet access and frequently share devices with family members, compromising continuity and concentration during assessments. Academic integrity also emerges as a critical concern; the unproctored nature of online tests has led to increased suspicion of dishonest practices, with faculty reporting frequent instances of impersonation and unauthorized resource usage. This undermines the credibility of the digital evaluation process and creates distrust among stakeholders. Another major hurdle is the insufficient preparedness among faculty members to design and administer effective digital assessments. Many rely on default templates provided by learning management systems or depend on technical staff for execution, indicating a lack of confidence and training in digital pedagogy. Additionally, the limitations of assessment platforms pose a structural bottleneck most institutions lack the financial resources to invest in advanced tools like automated proctoring software or detailed analytics dashboards, making it difficult to ensure robust assessment quality. Equity also remains a persistent issue, with several students expressing difficulty in navigating digital interfaces due to inadequate exposure and lack of formal training. These interconnected challenges emphasize the need for a systemic overhaul in both technological infrastructure and human capacity to enable effective digital assessments in resource-limited academic environments.

7. Policy Recommendations

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8. Conclusion

This study, conducted in the Khulna Division of Bangladesh, confirms that digital assessment tools offer strong potential in enhancing student performance, feedback mechanisms, and overall engagement. However, traditional assessments continue to offer unmatched reliability in terms of integrity and credibility.

The path forward lies in balancing these tools. Institutions must tailor their strategies to the infrastructural and pedagogical context. For regions like Khulna, where digital readiness varies widely, a blended assessment approach backed by training and infrastructure investment is the most sustainable model.

9. References

1. Black P, Wiliam D. Assessment and classroom learning. Assessment in Education. 1998;5(1):7-74.
2. Bennett RE. Formative assessment: A critical review. Assessment in Education. 2015;22(1):1-21.
3. Nicol DJ. E-assessment by design using multiple-choice tests to good effect. Journal of Further and Higher Education. 2007;31(1):53-64.
4. McCabe DL, Butterfield KD, Treviño LK. Cheating in college: Why students do it and what educators can do about it. Johns Hopkins University Press; 2018.
5. Redecker C, Johannessen Ø. Changing assessment-towards a new assessment paradigm using ICT. European Journal of Education. 2013;48(1):79-96.
6. University Grants Commission of Bangladesh. Digital Education Report. Dhaka: UGC Press, 2021.