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Enhancing Academic Integrity and Efficiency through E-Marking: A Case Study of Allama Iqbal Open University (AIOU)

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Abstract
E-marking or electronic marking is a promising alternative to traditional paper marking in the digitalisation of higher education, offering efficiency, transparency and integrity. This study evaluated e-marking at Allama Iqbal Open University (AIOU); its effects on examiner job satisfaction, speed and efficiency, and administrative workflows. This mixed methods research comprised a questionnaire for 128 e-examiners and system turnaround time data. The results showed 82% of examiners rated the system user-friendly, 70% indicated increased speed in marking, and 79% marked scripts primarily on laptops. Volume of scripts marked per semester was 1,000-1,500 (37%), with 2,500 scripts (10%) for those with higher workloads, suggesting scalability of the system. Issues included slow speed (40%), system downtime (20%) and lack of training (50%). Regarding academic integrity, 60% found plagiarism detection effective for verbatim copying, and 55% requested clearer institutional guidelines. Overall, 80% were keen to use e-marking again. E-marking has improved efficiency, accuracy and sustainability at AIOU, it is concluded. Capacity-building, infrastructure improvements, integration of advanced plagiarism detection tools and institutional guidelines are recommended to enhance scalability.

Keywords: e-marking, e-assessment, academic integrity, digital assessment, examiner satisfaction, AIOU, distance education, open learning

1. Introduction

Higher education institutions around the world are undergoing rapid and profound digital transformation. As technology continues to evolve, and expectations for quality and access to education continue to shift, universities are seeing an increasing shift from traditional paper-based to digital processes that are quicker, more transparent and more efficient (Rodríguez-Abitia & Bribiesca-Correa, 2021). In this transformation, one of the most critical areas of change has been assessment and marking techniques. The way students are assessed matters to their learning, the standards of their qualification and the reputation of the university. An important development in this area is electronic marking (e-marking or onscreen marking - OSM). E-marking is electronic marking of

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examination scripts and assignments using computer-based software, in which examiners assess students' answer sheets on a computer screen rather than on paper. This generally involves either scanning answer scripts or receiving digital submissions, which are then accessible via secure online platforms. These systems can be used to assess multiple-choice questions, short and long answer responses and, in some cases, even video submissions for practical tests. E-marking is not a new phenomenon in world education. It has been around for some time in major national exams, such as in the United Kingdom for GCSEs and A-levels, and in the United States for standardised tests. Studies on its validity have been generally encouraging. Johnson, Nádas and Bell (2010) showed that there was no difference in the quality of marking between paper and onscreen, and this was confirmed by Johnson, Hopkin, Shiell, and Bell (2012), who found that examiner accuracy was consistent across different marking modes. More recently, Coniam (2016) examined markers' perceptions across five disciplines and discovered that perceptions about OSM (on-screen marking) were influenced by the ease of use of the marking platform, as well as the effectiveness of the quality-control measures of the system. These reports suggest that, when properly managed, e-marking is not only a viable alternative to conventional marking in terms of quality; it can be "better" in some ways. What makes e-marking better? The benefits are not unknown. Marking is done anonymously and securely to minimise bias. Examiners can clearly mark up student work using annotation tools. Assessment is automatically scored, avoiding the kind of arithmetic errors that are surprisingly common in traditional assessment. Managers can track the status of marking in real time, identify bottlenecks and keep audit trails. And with a digital process, there's no chance of scripts getting lost, damaged or even lost in the mail - a common issue with many large-scale assessment programs. But in addition to quicker marking times, e-marking software is now often integrated with Learning Management Systems (LMS) and can include features such as plagiarism detectors, artificial intelligence (AI) marking assistance and "data dashboards". Software like Inspera Assessment, RM Results e-Marking, Turnitin and Gradescope are some of the systems available. These are transformative features for universities with complex assessment processes, particularly those with multiple campuses and/or high numbers of distance education students. Academic integrity is an important consideration. The shift to online assessment has opened up both possibilities and challenges. Holden, Norris and Kuhlmeier (2021) conducted a scoping review of research into academic integrity in online assessment and noted that while digital assessment provides the opportunity for new types of cheating, it also allows new strategies for detection. Software for detecting plagiarism is widely used - Turnitin alone is used by more than 16,000 institutions worldwide, however research has consistently found that these software tools are much better at detecting direct copying than they are at detecting plagiarism by paraphrasing or AI-assisted writing (Rogerson & McCarthy, 2017). For institutions embracing e-marking, enhancing integrity processes is a must. This is especially true for open and distance learning (ODL) institutions, which face the added challenges of high numbers of students, tutors spread across great distances, and high volume assessments. COVID-19 has dramatically expedited this process, with many institutions forced to put digital assessment systems

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in place with little time for preparation, and in the process, garnering a lot of information about what does and does not work (Elzainy, El Sadik, & Al Abdulmonem, 2020). Allama Iqbal Open University (AIOU) is at the forefront of this issue. Founded in 1974, AIOU is one of the world's largest distance education providers, catering to millions of students across Pakistan via a network of regional centres and tutors spread across the country. AIOU has long relied on conventional paper marking for its extensive assessment processes - a laborious, expensive and error-prone process, from calculation errors to lost scripts. To overcome these problems, AIOU has developed an e-marking system that allows registered tutors to mark scripts from anywhere. This system features automated scanning of scripts, real-time monitoring of examiner progress, audit trails and onscreen marking. This was done to overcome the particular challenges of the previous system and meet international standards for assessments at AIOU. While research on e-marking is increasing, there is a dearth of empirical studies of e-marking in large-scale ODL institutions, especially in developing country settings with potentially limited digital infrastructure and varying levels of examiner technology competence. This research seeks to address this. Through a mixed-method analysis of AIOU's e-marking experience - including survey data from 128 e-examiners and data from e-marking system records - it aims to produce evidence-based lessons that are locally relevant and globally applicable. The rest of this paper is organised as follows: Section 2 discusses the literature on e-marking, e-assessment and academic integrity. Section 3 provides the aims and questions of the research. Section 4 explains the research methods. Section 5 presents the findings. Section 6 concludes the paper and Section 7 provides recommendations for the development and maintenance of AIOU's e-marking system.

2. Literature Review

The use of digital technologies in higher education assessment has attracted increasing interest in the last 20 years. E-marking and e-assessment systems have been studied in a wide variety of institutional settings, focusing on how they impact assessment efficiency, equity, reliability, assessment integrity and user acceptance. This review explores the main themes of this research, focusing on those that are relevant to AIOU.

2.1 E-Marking Usability and Efficiency

A key finding of many studies, and perhaps the most commonly reported benefit of e-marking, is improved efficiency. Campbell (2005) was the first to report how ICT-based assessment tools could streamline the logistics of marking, particularly the more tedious task of calculating marks, recording comments and keeping track of marking sheets. His research showed that, when designed carefully, ICT-based tools can free up examiners' time to spend longer on the cognitive aspects of marking rather than the administrative.

Similar findings emerged in a recent study of e-assessment in Egyptian universities, where instructors reported they saved a lot of time, and valued the system's ability to organise and distribute scripts promptly (Mostafa 2023). Huda, Kabir, and Siddiq (2020) broadened this view to include students, revealing that both teachers and students in

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Bangladesh considered e-assessment as an improvement on conventional practices, especially with regard to the rapidity of feedback.

Sharlovych *et al.* (2023) in studying digital technologies in Eastern European higher education, found that blended and digital technologies, including assessment tools, were highly valued by students and teachers for their communicative and organisational benefits. Ndibalema (2021) also confirmed that e-assessment systems are well-accepted by digital native students, as long as they are fair, reliable and technically easy to use. But it's not necessarily easy to use. The research suggests the success of e-marking is dependent upon design and training. Jordan (2013) observed the development of e-assessment systems from their initial "experimental" use to more formal systems being used today and noted that the questions of integration and usability are now a critical issue for assessment bodies. The take-out message from this research is that a technically effective platform is only one of the ingredients of success.

2.2 Technical Challenges and Infrastructure Barriers

While there are many benefits to online assessment, there are also challenges. The literature consistently highlights the importance of technical infrastructure - especially internet connectivity, server capacity and access to devices - in the success of e-marking. Mayhew (2018) identified four primary barriers to the adoption of electronic assessment management systems in UK universities: "resistance to change", a lack of technical support, training and doubts regarding the reliability of the system. This was supported by Wahas and Syed (2024), who noted in the Gulf region, slow and unreliable internet, and ineffective helpdesk support, affected examiner trust in e-marking.

Shalatska *et al*. (2020) pointed to the need for technical harmonisation and integration across different systems to ensure compatibility between institutional systems. Alruwais (2018) identified the reasons why e-assessment was not being adopted in Saudi universities and found teachers were not willing to use the system because of a lack of technical support and perceived institutional support for training. This highlights something that we see again and again in the literature: technical issues are not just technical. They are also institutional, cultural and motivational. Without examiner support, even a good system will not deliver.

2.3 Quality, Reliability, and Sustainability

Reliability and validity are fundamental concerns for an assessment system. In a synthesis of multiple studies, Ahmed and Sidiq (2023) concluded that online assessments need to be well designed - with clear criteria, scoring rules and assessor training - to ensure they test what they set out to. De Villiers, Scott-Kennel and Larke (2016) outlined a model for successful e-assessment based on six principles: alignment with learning outcomes, consistency, flexibility, transparency, fairness, and support from the institution. This is a helpful guide for institutions to consider when designing or assessing e-marking systems.

Buzzetto-More and Alade (2006) outlined best practices for sustainable e-assessment, which include clear rubrics, staff and student training, and flexible e-assessment systems. Jordan (2013) observes that e-assessment has evolved from niche practice to

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mainstream institutional adoption - but that to be sustainable, investment in both technology and human capital is required. Rolim and Isaias (2019) provided a double-edged perspective, acknowledging that while teachers tend to be pleased with the time-saving benefits of e-assessment, students (and academics) are concerned about fairness and the quality of automated assessment systems, especially for complex or judgement-based tasks.

2.4 Academic Integrity in Digital Assessment

Online assessment is a contentious area of academic integrity. Assessment conducted online and via e-marking has created opportunities for academic dishonesty, as well as offering new ways to detect it. Gasparyan *et al*. (2017) outlined the recent trends in plagiarism detection and found that while technology has made it easier to detect copying, it remains difficult to detect more nuanced forms of cheating, such as paraphrasing plagiarism and collusion.

Ogwueleka (2025) examined the role of artificial intelligence in plagiarism detection, pointing out that while AI has great potential for more sophisticated and holistic integrity monitoring, it also raises ethical issues. Miller and Izsak (2017) revealed that student perceptions of copying are not uniform, with some seeing it as a "small sin". Pabian (2015) then discussed whether studies that consider copying as 'cheating' are reflective of the social and cultural context of student perceptions of academic integrity. Wollack (2004) successfully used technology to detect answer copying in high-stakes tests, but Iqbal *et al*. (2021) found that preventative measures (such as awareness campaigns, institutional policies and monitoring) are essential to complement the technology.

These studies show that a key issue is the distinction between detection and prevention of plagiarism. Technology can assist but it relies on institutions to take action following detection: establish policies, have consistent penalties and promote integrity.

2.5 Acceptance by users and readiness by institutions

The key to the success of e-marking systems is ultimately the willingness of users to accept and trust them. Mo, Tang, Wu, and Tang (2022) proposed a theoretical framework to understand the factors that influence the successful uptake of electronic assessment systems in universities, where perceived usefulness, ease of use and institutional support are the top three factors. The authors' conclusions are consistent with the Technology Acceptance Model (TAM), but apply it to the assessment environment. Appiah and Van Tonder (2018) emphasised the importance of considering readiness of both students and teachers in planning the rollout of a system, and concluded that blanket roll-outs are not effective. Alruwais (2018) found that institutional readiness (with respect to infrastructure, organisational support, and training) is the key to successful e-assessment. This was supported by Ndibalema (2021), who demonstrated that users will not continue to use a system that is perceived to be unreliable or unjust.

Table 1: Summary of Selected Studies on E-Marking and E-Assessment

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Author(s) & Year	Focus	Key Findings	Challenges Identified
Campbell (2005)	ICT & rubrics in assessment	Improved marking clarity, reduced admin burden	Depends on system design quality
Buzzetto-More & Alade (2006)	Best practices in e-assessment	Consistent rubrics and training enhance sustainability	Need for ongoing institutional commitment
Jordan (2013)	Evolution of e-assessment	Moved from experimental to structured mainstream use	Sustainability requires continued investment
De Villiers *et al.* (2016)	Principles of e-assessment	Framework: alignment, consistency, fairness	Institutional commitment essential
Alruwais (2018)	E-assessment barriers in Saudi HE	Academics reluctant without adequate support	Insufficient training & technical support
Rolim & Isaias (2019)	Teacher/student views on e-assessment	Efficiency appreciated; fairness concerns remain	Reliability for subjective assessments
Mo *et al.* (2022)	Adoption determinants for EAS	Usefulness, ease of use, and support are key drivers	Institutional readiness critical
Sharlovych *et al.* (2023)	Digital technologies in HE	Enhanced efficiency and communication	Limited by institutional capacity
Wahas & Syed (2024)	E-assessment challenges in HE	Connectivity and support gaps undermine confidence	Infrastructure and helpdesk reliability
Ogwueleka (2025)	AI & plagiarism detection	AI improves detection but raises new ethical issues	Paraphrasing and AI-generated content hard to detect

3. Objectives and Research Questions

This study was guided by three core objectives:

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- To examine the effect of e-marking on marking efficiency and workload management among AIOU examiners.
- To evaluate examiner perceptions regarding the usability, fairness, and reliability of the e-marking system.
- To identify barriers and enablers to adoption, and to propose targeted strategies for scaling and sustaining the system.

These objectives gave rise to three corresponding research questions:

- How has e-marking influenced turnaround time and workload distribution at AIOU?
- What are examiner perceptions regarding the fairness and usability of the system?
- What institutional challenges accompany the adoption of e-marking, and how can they be addressed?

4. Methodology

4.1 Research Design

A mixed methods approach was adopted for this study, which involves gathering and analysing quantitative and qualitative data to understand the phenomenon (Creswell & Clark, 2017; Tashakkori & Teddlie, 2021. This methodology is suitable for applied educational studies where quantitative data can be augmented with participants' views and opinions.

The quantitative analysis involved a questionnaire survey of 128 e-examiners from AIOU. This gathered data on the demographics, computer used, workload, time taken to mark and perceptions of e-examiners in terms of four dimensions: efficiency/ease of use; technical problems/support; academic integrity; and sustainability. Data generated by the e-exam system (marking logs, turnaround times) were used to supplement this, and to provide a reference point for perceptions of the e-examiners.

The qualitative component of the study involved semi-structured interviews with purposively selected examiners and administrators. This helped us to better understand the implementation and the "why" in the survey responses.

4.2 Participants and Sampling

The participants for this study were AIOU-registered e-examiners from various faculties and campuses. Purposive sampling was adopted to ensure representation from a range of teaching experiences, technology use and digital literacy levels - variables known to affect technology adoption (Etikan, Musa, & Alkassim, 2016). The survey sample included 128 examiners, ensuring an adequate representation of variability in the key variables.

4.3 Data Collection Instruments

The questionnaire included six sections: background (age, gender, years of teaching experience); experience with e-marking; technology access and device use; workload (number of scripts marked per semester, average time to mark scripts); and a five-point

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Likert scale (strongly disagree-strongly agree) rating perceptions of system use, fairness and integrity, as well as open-ended questions for suggestions and comments. The semi-structured interview guide for the qualitative study focused on changes in workflows; training and technical support; allocation of resources; and impact on the institution. Semi-structured interviews were chosen for their demonstrated effectiveness in obtaining structured and unstructured views (Kallio, Pietilä, Johnson, & Kangasniemi, 2016).

4.4 Data Analysis

The quantitative data were subjected to descriptive analysis (frequencies, percentages, means and standard deviations) and cross-tabulations to investigate interactions between pertinent variables including device used, workload, and user satisfaction. The qualitative data were transcribed and analysed using thematic analysis, as outlined by Braun and Clarke (2006), to identify key themes in the interview data. Combining quantitative and qualitative results allowed triangulation, which provided a higher degree of validity and interpretation for the study (Fetters, Curry, & Creswell, 2013).

5. Results and Findings

5.1 Profile of the Respondents

The 128 examiners who responded to the study are a diverse group with extensive experience. 60% of the respondents were males and 40% females, reflecting a fairly balanced gender representation among e-examiners. The majority of respondents (49%) fell in the 31–40 age bracket, with 38% aged 41–50 and 12% above 51 years. This finding indicates that the e-marking initiative at AIOU is being embraced by mid-career staff - not just young, "digital native" academics.

When asked about their teaching experience, 40% have more than 15 years' experience, 32% 11-15 years and 28% 5-10 years. This distribution is significant as it dispels the myth that technology is only being adopted by younger staff. Experienced teachers are also using the e-marking system, which demonstrates its user-friendliness.

When it came to experience with e-marking, 18% of the respondents had used the e-marking system in the past (through the Punjab Examination Commission, Federal Board, and Punjab Group of Colleges), and 82% were using e-marking for the first time via AIOU. And the overwhelming majority (82%) had been using the AIOU system for 2-3 semesters, giving them time to familiarise themselves and develop their views.

In terms of technology, As shown in Figure 1 below laptops were the most common device (79%). The next most popular device was the mobile phone (15%), followed by desktops (3%) and tablets (2%).

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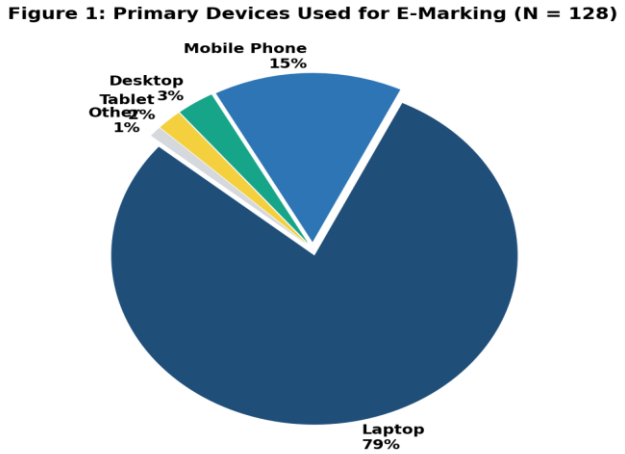

Figure 1: Primary Devices Used for E-Marking (N = 128 Examiners)

Workloads were substantial: 37% marked 1,000–1,500 scripts per semester, 34% handled 500–1,000, and 21% managed more than 1,500 scripts. Despite such workloads, the marking process was remarkably fast - 44% of tutors marked in 5-10 minutes per script and 40% in less than 5 minutes, suggesting that the system allows high efficiency.

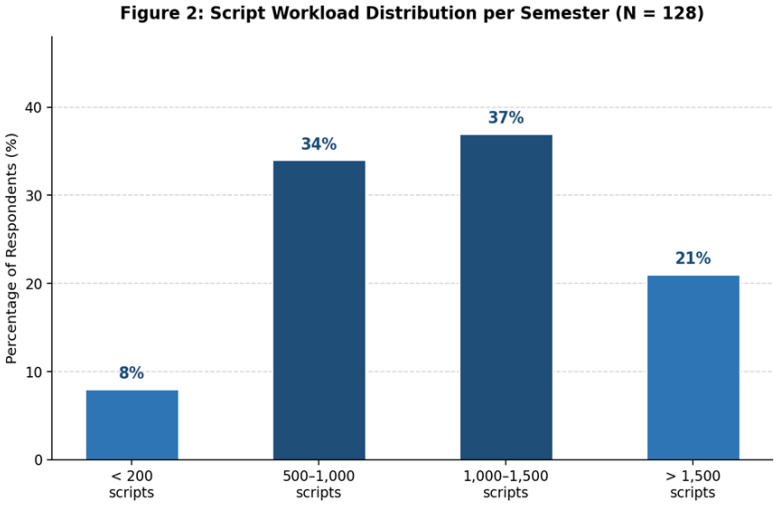

Figure 2: Examiner Workload – Scripts Marked per Semester (N = 128 Examiners)

Table 2: Demographic Profile of Respondents (N = 128)

Variable	Category	Percentage (%)
Gender	Male	60
	Female	40
Age Group	20–30 years	1
	31–40 years	49
	41–50 years	38

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	51+ years	12
Teaching Experience	5–10 years	28
	11–15 years	32
	More than 15 years	40
Prior E-Marking Exp.	Yes	18
	No	82
Duration at AIOU	1 semester	3
	2–3 semesters	82
	4+ semesters	15
Devices Used	Laptop	79
	Mobile Phone	15
	Desktop	3
	Tablet	2
Scripts per Semester	< 200	8
	500–1,000	34
	1,000–1,500	37
	> 1,500	21
Marking Speed	< 5 min/script	40
	5–10 min/script	44
	> 10 min/script	16

5.2 Usability and Efficiency

The usability of AIOU's e-marking system was a huge achievement. More than 80% (82%) of the examiners found the system to be user-friendly, suggesting that the system is relatively easy to use and does not demand a high degree of technical skills. This result is supported by the works of Ndibalema (2021) and Mo *et al*. (2022) who found ease of use is a determinant of the adoption of online assessment systems.

Increased efficiency was also noted. Seventy per cent of the respondents reported that they took less time to mark scripts using e-marking than the traditional way, and 65% of respondents reported the "time-efficiency" of e-marking facilities such as batch processing and automated commenting. Efficiency is important - for an exam board

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like AIOU that marks thousands of scripts per semester, even a small saving in time taken to mark each script can make a big difference. But 15% of the sample felt that the system was slow in processing a large number of scripts, so perhaps this server activity needs to be improved.

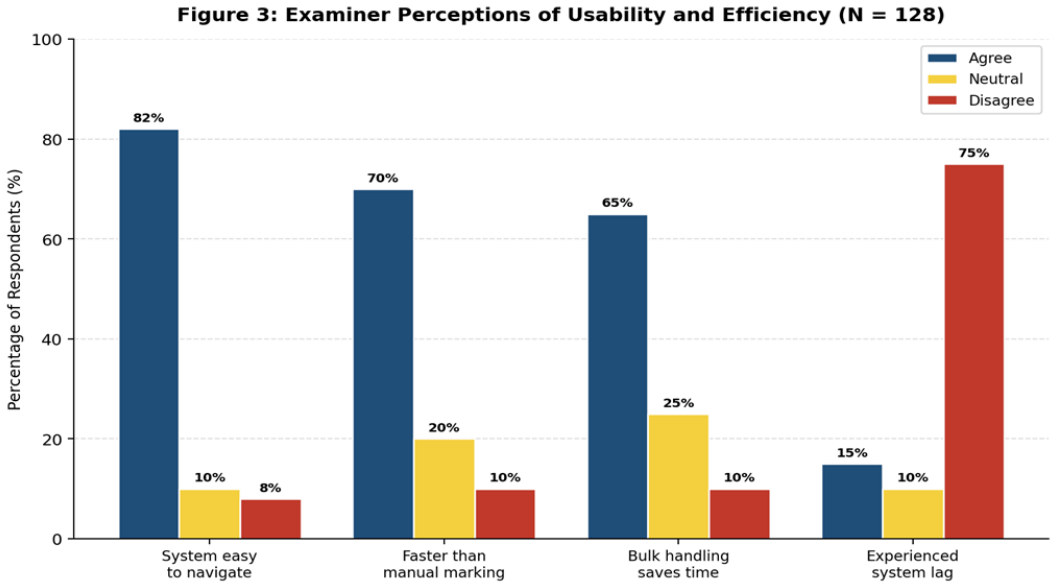

Figure 3: Examiner Perceptions of Usability and Efficiency (N = 128 Examiners)

Table 3: Perceptions of Usability and Efficiency

Statement	Agree (%)	Neutral (%)	Disagree (%)
System is easy to navigate	82	10	8
E-marking is faster than manual marking	70	20	10
Bulk handling and automated comments save time	65	25	10
Experienced system lag during heavy use	15	10	75

5.3 Technical Challenges and Support

Although the overall level of usability was high, the study identified some technical issues that are significant. 40% of respondents reported the system was slow to load, while 20% reported occasional system outages. While these problems were not ubiquitous, they were experienced by a significant minority of users whose experience with the system has been impacted - and in the case of assessments, delays in marking times have flow-on effects for students awaiting their results.

In terms of support, 67% of respondents felt the technical support team responded promptly and effectively, 21% felt there was a delay in the team's actions to resolve problems and 12% had mixed opinions. This suggests that the support system is

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generally effective, but not entirely consistent - a crucial consideration in the event of system issues during key marking periods.

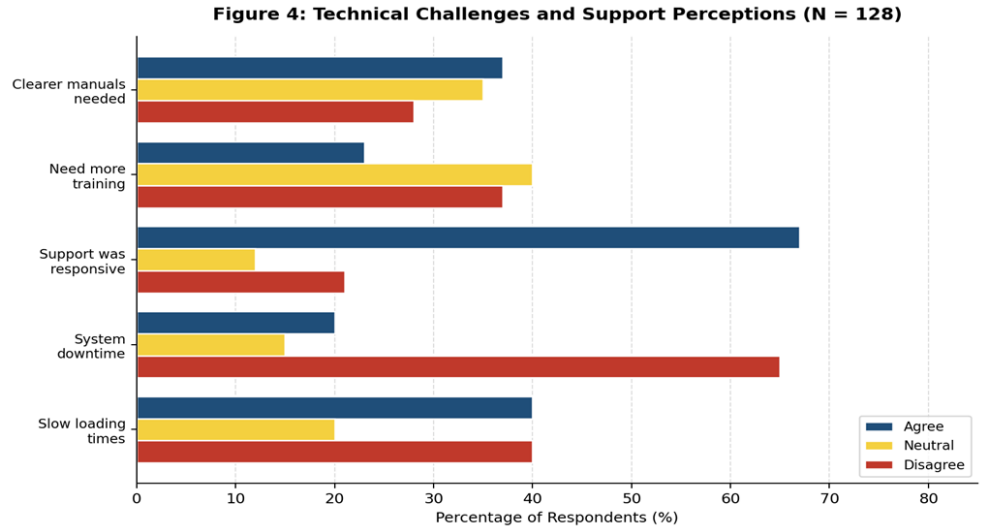

Figure 4: Technical Challenges Reported by Examiners (N = 128 Examiners)

Another area for improvement was training. A total of 23% requested more training and 37% requested more comprehensive manuals. When asked how they would like to receive additional training, 43% responded that they would prefer an updated training video, 35% did not think they needed additional training, 14% preferred live online training (e.g. Zoom) and 8% preferred step-by-step PDF manuals. The preference for video is consistent with the shift in online education to asynchronous learning, rather than live sessions.

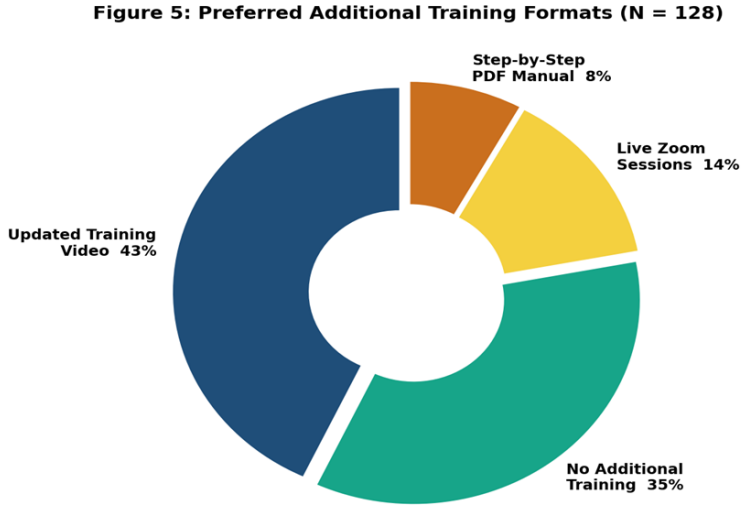

Figure 5: Preferred Format for Additional Training (N = 128 Examiners)

Table 4: Technical Challenges and Support Feedback

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Statement	Agree (%)	Neutral (%)	Disagree (%)
Experienced slow loading times	40	20	40
Experienced system downtime	20	15	65
Technical support was responsive and effective	67	12	21
Need more training on advanced features	23	40	37
Clearer user manuals would be helpful	37	35	28

5.4 Academic Integrity

Academic integrity was one of the most nuanced dimensions of this study. Figure 6 presents the distribution of examiner responses on two key integrity questions: their confidence in detecting cheating from scanned scripts, and whether additional plagiarism detection tools are needed.

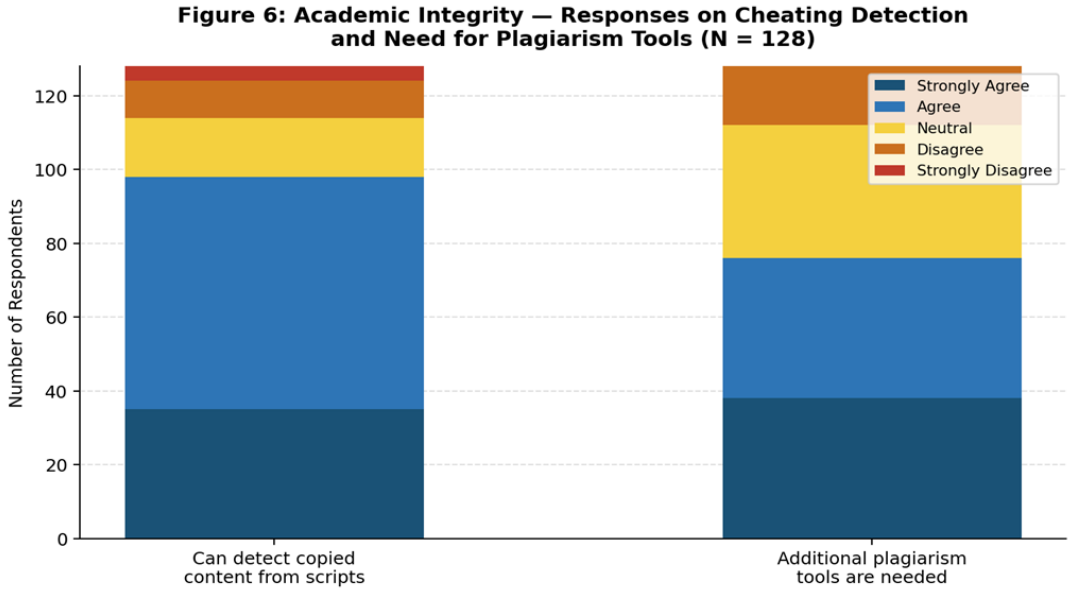

Figure 6: Academic Integrity – Detecting Cheating and Need for Additional Detection Tools

A large majority of examiners (63 agreed, 35 strongly agreed - or 76% of the total sample) felt confident about being able to identify plagiarism or "suspicious" text in scanned scripts. However, a substantial minority - 16 were neutral, and 14 disagreed - were less confident, a relatively large number in a system that processes thousands of scripts.

When they were asked if more "technology tools" were needed to detect plagiarism, the responses were more evenly distributed: 38 strongly agreed, 38 agreed, 36 were neutral,

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and 16 disagreed. This is noteworthy. Even those examiners who think they are themselves capable of detecting cheating "manually" understand that the systematic help of technology would support cheating detection - particularly given the limitations of the current text-matching software to detect plagiarism by paraphrasing (Gasparyan et al., 2017; Ogwueleka, 2025). 60% of the participants felt that the current technology tools are efficient in detecting verbatim copying, 65% agreed that they are not efficient in detecting paraphrased plagiarism and 55% explicitly called for clearer institutional policy on academic integrity.

These findings are in line with other research that argues that plagiarism detection software is a powerful, but not foolproof, tool that should be complemented by a strong institutional integrity culture, policies and training (Iqbal et al., 2021; Wollack, 2004).

5.5 Institutional Fit and Sustainability

One of the most striking findings relates to how strongly examiners align e-marking with AIOU's institutional and sustainability goals. Figure 7 illustrates these perceptions across four statements.

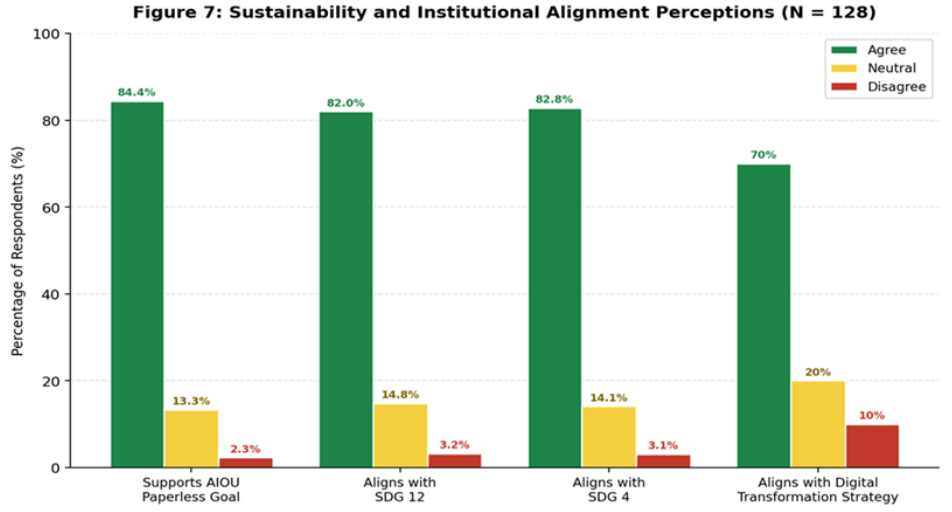

Figure 7: Examiner Perceptions of E-Marking Sustainability and SDG Alignment

Perhaps the most remarkable finding in this study is the extent to which examiners see e-marking as contributing to AIOU's institutional priorities and sustainability efforts. An impressive 84.4% agreed that e-marking supports AIOU's goal to become a paperless university. Likewise, 82% agreed that e-marking supports SDG 12 (Responsible Consumption and Production) because of the paperless nature. And 82.8% agreed that e-marking contributes to SDG 4 (Quality Education) by enhancing equity, accessibility and modernity of the assessment process.

Table 5: Sustainability and Institutional Alignment

Statement	Agree (%)	Neutral (%)	Disagree (%)
E-marking supports AIOU's paperless goal	84.4	13.3	2.3

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E-marking aligns with SDG 12 (responsible consumption)	82.0	14.8	3.2
E-marking aligns with SDG 4 (quality education)	82.8	14.1	3.1
E-marking aligns with AIOU's digital transformation strategy	70	20	10

5.6 Satisfaction and Examiner Recommendations

Examiners were extremely satisfied with the e-marking system. A total of 72% strongly agreed that they were satisfied with the system, while 20% agreed - 92% were overall positive about their satisfaction. When asked about the continuation of e-marking, 70% strongly agreed and 18% agreed that e-marking should be continued and improved. Very few were undecided or disagreed.

Figure 8: Overall Examiner Satisfaction and Recommendation for Continuation (N = 128)

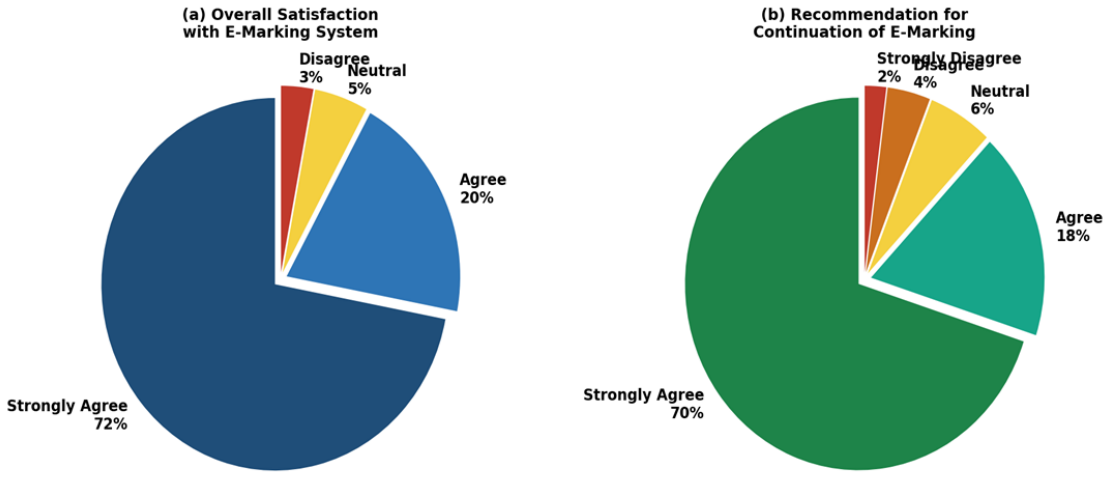

Figure 8: Overall Examiner Satisfaction and Recommendation for Continuation

When survey participants were asked to name what they would prioritise to be improved, the top requested improvement was integration with plagiarism detection software (21.5%). Improved technical support and responsiveness of the helpdesk and improved speed of the system were each recommended by 16.9%. 15.4% of respondents suggested the software interface should be improved and that refresher workshops be offered more frequently, respectively; 13.8% suggested training.

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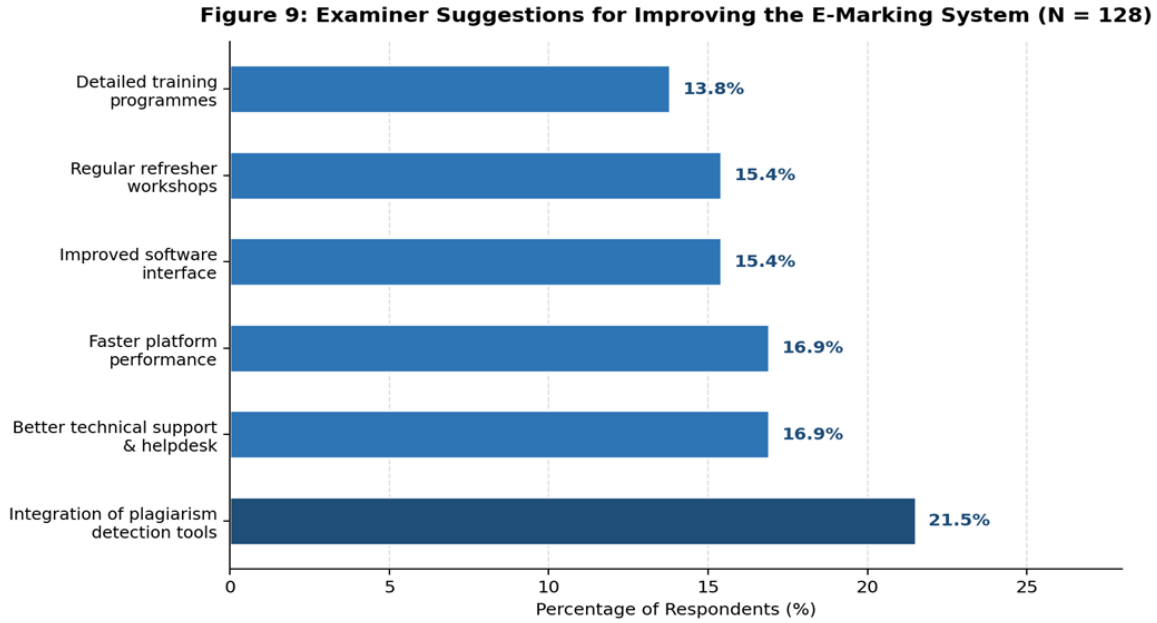

Figure:9 Examiners' Suggestions for improving E-marking

The suggestions are consistent: examiners are supportive of the system and want to see it succeed, but they want it to perform more consistently, to have more integrity support, and to have more regular training and technical support.

6. Conclusion

The aim of this study was to assess AIOU's e-marking system from the perspective of examiners, and the results are generally positive. The system has boosted the productivity of assessment processes in one of the world's largest distance education providers, facilitating the marking of thousands of exams by a dispersed examiner workforce. An overwhelming proportion of examiners (92%) were satisfied with the system and advocated for it to continue. Eighty-two percent considered the system simple to use and 70% completed marking tasks quicker than they would with other methods.

At the same time, the research highlights a range of operational issues that, if not resolved, could limit the benefits. System stability - especially loading speeds and occasional outages - is a problem for a significant number of users. Algorithms for detecting plagiarism are seen as inadequate to identify advanced forms of cheating. Not all users are well-trained and many examiners perceive themselves as unable to use more sophisticated aspects of the system. And while institutional commitment is good in terms of values and sustainability, better policies and guidelines are needed to ensure full integration of the system's integrity tools.

The conclusion to be drawn from this evidence is clear: AIOU's e-marking initiative is well under way. It doesn't need a rethink, but it does need careful refinement in the form of investment in infrastructure, better training, improved tools for academic integrity and better institutional protocols. Once these are in place, AIOU will have the

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opportunity to set up its e-marking system as a benchmark for other large-scale ODL institutions in developing regions..

Overall satisfaction with the e-marking system was strikingly high. Seventy-two percent of respondents strongly agreed that they were satisfied with the system, and a further 20% agreed — meaning 92% expressed positive satisfaction overall. On the question of continuation, 70% strongly agreed and 18% agreed that e-marking should continue and be further developed. Only a small minority expressed neutral or negative views.

When respondents were asked to choose the most important areas to improve, the most common answer was integration of plagiarism programs (21.5%). More responsive technical support and helpdesk services (16.9%) and improved system speed (16.9%) were also recommended. Better user interface and more frequent refresher workshops were both suggested by 15.4%, and more formal training programs by 13.8%.

These recommendations paint a consistent picture: examiners believe in the system and wish it to be successful, but need it to be more robust, to have better integrity support and to receive more regular training and technical support.

7. Recommendations

The following are recommendations based on the findings of this study for AIOU's academic management and e-marking managers:

i. **Improve Training and Support:** The single most common form of improvement requested by the sample of examiners was more training. AIOU should provide regularly updated, on-demand training videos the preferred resource for 43% of respondents and online sessions for those who would prefer interactive learning. First time users should be offered systematic induction training, and training should be provided at the beginning of each assessment cycle.

ii. **Improve Technical Infrastructure:** The server should be upgraded to remove the delays and downtimes stated by a large number of examiners. The performance of the system should be scrutinised during the peak marking period and there should be contingency plans for technical outages to avoid delays in marking.

iii. **Add Sophisticated Plagiarism Detection:** The present system's inability to detect paraphrasing-based plagiarism - as reported by 65% of respondents - should be overcome by adding more advanced integrity tools. AIOU should consider platforms that incorporate AI in detecting plagiarism, and institutional policy for responding to plagiarism alerts should be developed to ensure consistency and transparency across all faculties.

iv. Introduce a Technical Support Framework: A more formalised technical support framework should be established, including a first-line helpdesk for user queries and a team of experts for technical issues with the platform. Turnaround times should be established, especially during peak marking periods when slow response times can cause disruption.

v. Integrate Policy and Strategy: E-marking should be formally integrated into AIOU's institutional digital strategy, with policies on academic integrity, examiner conduct, and system administration. This will enhance the system's legitimacy and

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demonstrate institutional support, as well as helping AIOU meet Sustainable Development Goal 4 (Quality Education) and Sustainable Development Goal 12 (Responsible Consumption and Production).

Disclaimer

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