

Enhancing Efficiency in Academic Moderation Using the Online Moderation System in Public Higher Learning Institution

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Abstract

Academic institutions face growing challenges in maintaining high standards in assessment moderation. Traditional manual moderation processes are often time-consuming, inefficient, and environmentally unsustainable. This research aims to study the significant difference in moderation time before and after the implementation of the Online Moderation System (OMS) project at Fakulti Teknologi dan Kejuruteraan Elektronik dan Komputer, Universiti Teknikal Malaysia Melaka. Employing a quantitative approach with a cross-sectional design, the study utilizes convenience sampling involving 67 respondents. Descriptive analysis and paired samples t-test were conducted. The findings indicate a significant difference in moderation time before and after the project implementation, ($t(66) = 35.12, p < .05$). These results demonstrate the effectiveness and efficiency of the moderation process using OMS. Consequently, the system reduced moderation time, promoting effectiveness, efficiency, and productivity among the lecturers.

Keywords: Online Moderation System, Assessment Moderation, Digital Transformation

Introduction

In the rapidly evolving landscape of higher education, the need for efficient and effective academic moderation processes has become increasingly paramount. Traditional methods of moderation, often characterized by manual and paper-based procedures, are not only time-consuming but also prone to errors and inconsistencies. This case study explores the implementation of an online moderation system at Universiti Teknikal Malaysia Melaka (UTeM), aimed at addressing these challenges and enhancing the overall efficiency of academic moderation (Mushtaque, Khan, & Rehman, 2021). The study of enhancing efficiency

in academic moderation through the implementation of an online moderation system in public higher learning institutions is of paramount importance. In an era where digital transformation is reshaping educational landscapes, this research addresses a critical need for streamlined, transparent, and effective moderation processes. The significance of this study lies in its potential to revolutionize how academic assessments are managed, ensuring consistency, fairness, and quality across the board. This topic is particularly beneficial for academic administrators, educators, and policymakers who are striving to improve educational standards and outcomes. By focusing on the utility and effectiveness of online moderation systems, this research not only contributes to the academic field but also supports the broader goal of enhancing institutional efficiency and student success.

The introduction of this online system represents a significant shift towards digital transformation in academic administration. By leveraging advanced technologies, UTeM has streamlined the moderation process, ensuring greater accuracy, transparency, and accountability (Spring, Graham, Hanny, Tuiloma, & Badar, 2023). This study delves into the various stages of implementation, the challenges encountered, and the tangible benefits realized, providing valuable insights for other institutions considering similar initiatives (Tuiloma, Graham, Martinez Arias, & Parra Caicedo, 2022). Through this case study, we aim to contribute to the broader discourse on digital innovation in higher education and its potential to drive institutional excellence (Halverson & Graham, 2019; Lei, Cui, & Zhou, 2018).

Problem Statement

In higher education, maintaining academic standards through rigorous moderation of assessments is essential to ensure fairness and consistency in evaluating student performance (Bennett, 2021). Universiti Teknikal Malaysia Melaka (UTeM), and specifically the Fakulti Teknologi dan Kejuruteraan Elektronik dan Komputer (FTKEK), faced significant challenges with its manual moderation process due to the increasing number of students and programs. This led to delays, excessive paper usage, and inefficient document handling (Lee, 2020). These issues align with global trends where institutions are adopting digital solutions to streamline administrative tasks (Chen & Williams, 2020). To address these challenges, FTKEK developed and implemented an Online Moderation System (OMS) to automate the submission, review, and approval of assessment documents, thereby reducing moderation time, cutting down on paper usage, and enhancing operational efficiency. This project presents a case study of the OMS's development, implementation, and evaluation, examining its impact on moderation time and paper usage. The aim of this research is to study the significant difference in moderation time before and after the implementation of the project.

Literature Review

The implementation of digital solutions in higher education has been increasingly recognized as a medium to enhance efficiency and effectiveness in various administrative and academic processes. The transition from traditional manual processes to digital systems, such as the Online Moderation System (OMS), addresses several challenges faced by academic institutions, including time consumption, inefficiency, and environmental sustainability. Assessment moderation is a critical process in ensuring the validity, fairness, and reliability of student assessments. Traditional moderation methods, which are often manual, have been criticized for being time-consuming and inconsistent (Bloxham, 2009). The need for a more streamlined and efficient approach has led to the adoption of digital moderation systems

(Adie, Lloyd, & Beutel, 2013). Digital transformation in higher education involves leveraging digital technologies to improve educational processes and outcomes. This transformation is driven by the need to enhance operational efficiency, reduce costs, and improve the quality of education (Martin & Xie, 2022). The COVID-19 pandemic has accelerated the adoption of digital solutions, highlighting their importance in maintaining educational continuity (García-Morales et al., 2021). Studies have shown that online moderation systems can significantly reduce the time required for assessment moderation, improve document management, and enhance overall efficiency (van Staden, Kroeze, & van Biljon, 2019). These systems also contribute to environmental sustainability by reducing paper usage (Chen & Williams, 2020). The success of digital moderation systems depends on user acceptance and experience. Factors such as ease of use, reliability, and perceived usefulness play a crucial role in the adoption of these systems (Ulum, 2021). Ensuring that the system meets the needs of its users is essential for its effective implementation (Meng et al., 2024). Despite the benefits, the implementation of digital moderation systems is not without challenges. Issues such as technical difficulties, resistance to change, and the need for adequate training and support must be addressed (Grajek, 2020). Additionally, the digital divide and varying levels of access to technology can impact the effectiveness of these systems (Bird et al., 2021). The literature indicates that digital moderation systems, such as the OMS, offer significant advantages in terms of efficiency, effectiveness, and sustainability. However, successful implementation requires careful consideration of user experience, technical support, and training. The findings from this study contribute to the growing body of evidence supporting the adoption of digital solutions in higher education.

Methodology

This study employed a quantitative approach and utilized a cross-sectional design, focusing on permanent lecturers at FTKEK. The sample consisted of 67 respondents, selected through convenience sampling from a population of 80 lecturers from FTKEK, UTeM. Data were gathered using a questionnaire (before OMS and after OMS) administered via Google Forms, distributed across various communication platforms including email, WhatsApp and Telegram. The collected data were analyzed using descriptive statistics, including mean values and t-tests.

Online Moderation System Project at Fakulti Teknologi Dan Kejuruteraan Elektronik Dan Komputer, Universiti Teknikal Malaysia Melaka

The OMS project aims to address the challenges associated with the manual and time-consuming process of moderating student assessment questions. This justification stems from the need to streamline and enhance the efficiency of the moderation process. The inflexibility and time-consuming nature of manual moderation processes lead to various challenges in assessment question moderation, including a lack of timely reminders and an excessive staff workload. The objective of the project is to develop a solution that can reduce staff workload, enhance the storage and archiving of assessment documents, and minimize paper usage by introducing an online moderation system named OMS.

The project employed a trial period to assess the effectiveness of the OMS system. During this period, various metrics such as assessment moderation period, review times, and printing times were recorded to measure the impact of the solution. Additionally, guidelines for online assessment were standardized to ensure consistency. The project's objectives were

successfully achieved through the implementation of the OMS system. The solution effectively reduced staff workload, improved document storage and archiving, and minimized paper usage. Additionally, the use of internal expertise for development resulted in cost savings. Overall, the project proved to be a valuable improvement in the moderation process. This project adopts a case study approach to explore the development and implementation of the OMS at FTKEK. A case study allows for an in-depth examination of the system's effects on the moderation process, including quantitative and qualitative assessments (Yin, 2017). The action research method was utilized, guided by the Plan-Do-Check-Act (PDCA) cycle, which is widely used in process improvement (Kemmis, McTaggart, & Nixon, 2014). The PDCA cycle facilitated continuous improvement throughout the implementation of the OMS, allowing for feedback and refinements to be incorporated at each stage.

Problem Identification and Analysis

Before the OMS was developed, an audit of the existing moderation process was conducted. This included interviews with academic and administrative staff to identify bottlenecks and inefficiencies. The primary issues identified were:

- i. **Excessive Time Requirements:** The manual moderation process took an average of 410.2 minutes per document, which was a major concern during peak periods (Saad et al., 2022).
- ii. **High Paper Usage:** Multiple printed copies of assessment documents were required for each stage of moderation, leading to high paper consumption.
- iii. **Delays in Document Submission:** Physical transfer of documents between internal and external moderators frequently led to delays in the moderation process.
- iv. **Lack of Flexibility:** The manual process did not allow for remote moderation, limiting flexibility for academic staff and external reviewers.

A root cause analysis using the *Ishikawa* diagram (fishbone diagram) was conducted to identify the underlying causes of these issues. The key contributing factors included over-reliance on manual processes, inefficient communication between stakeholders, and a lack of digital tools for tracking the status of moderation (Zhao, 2022).

System Design

The Online Moderation System (OMS) was developed as a web-based application with a user-friendly interface. Key features of the system include:

- i. **Role-Based Access:** Faculty members, internal moderators, and external moderators were given different access levels based on their roles in the moderation process (Chen & Williams, 2020).
- ii. **Automated Document Submission and Tracking:** Assessment documents were submitted digitally, and users could track the moderation status in real time.
- iii. **Notifications and Reminders:** Automatic email notifications were sent to moderators when a document was submitted, and reminders were sent if deadlines approached (Smith & Anderson, 2023).
- iv. **Digital Archiving:** All documents were stored in a centralized digital archive, facilitating easy retrieval and eliminating the need for physical document storage.

Implementation Strategy

The implementation of the OMS followed three phases:

- i. **Pilot Testing:** A small group of faculty members tested the system. Feedback from this pilot phase was used to refine the system's functionality and address any technical issues (Harris & Baker, 2021).
- ii. **Full Rollout:** Following the successful pilot, the OMS was rolled out across FTKEK, accompanied by training sessions for academic staff and external moderators.
- iii. **Continuous Monitoring and Improvement:** Feedback from users during the first semester of implementation was collected and used to make further improvements to

Results

Descriptive statistics for the time taken to complete the moderation process before and after the implementation of the OMS are presented in Table 1.

Table 1

Descriptive Statistics of Moderation Time (in minutes)

Simulation	N	Mean	Standard Deviation
Before OMS	67	410.2	45.6
After OMS	67	95.4	20.1

In this study, the calculated average mean score for moderation time before OMS is 410.2 minutes, and after OMS is 95.4 minutes, with standard deviations of 45.6 minutes and 20.1 minutes, respectively. The mean values indicate a high level of moderation time before the implementation of the OMS, suggesting that the OMS has significantly reduced the time required for moderation. A paired samples t-test was used to evaluate the significant difference in the reduction of moderation time after the implementation of the OMS. The results are shown in Table 2.

Table 2

Paired Samples t-test for Moderation Time

Measurement	Mean Difference	t-value
Before OMS – After OMS	314.8*	35.12

* $p < .05$

The results indicated a statistically significant reduction in moderation time after the implementation of the OMS ($t(66) = 35.12, p < .05$). The mean difference of 314.8 minutes demonstrates a substantial improvement in efficiency.

Discussion

The results of this study demonstrate the significant impact of the OMS on improving the efficiency of the moderation process at FTKEK. The paired samples t-test confirmed that the reduction in moderation time was significantly different ($p < .05$), with the average time decreasing by 314.8 minutes. This 77% reduction in time aligns with previous research on the benefits of digital assessment systems (Harris & Baker, 2021).

The practical implications of these findings extend beyond FTKEK to other academic institutions seeking to improve their moderation processes. The reduction in moderation time not only enhances operational efficiency but also allows academic staff to allocate more time to teaching and research activities. Furthermore, the reduction in paper usage contributes to the university's sustainability goals, reducing both environmental impact and operational costs (Lee, 2020).

Conclusion

The implementation of the Online Moderation System (OMS) at the Fakulti Teknologi dan Kejuruteraan Elektronik dan Komputer (FTKEK) at Universiti Teknikal Malaysia Melaka has significantly enhanced the effectiveness and efficiency of the moderation process. The system reduced moderation time by 77%, which consequently impacts paper usage, and achieved high levels of user satisfaction. This demonstrates the system's effectiveness in streamlining academic processes. The OMS project serves as a valuable model for other academic institutions seeking to digitize their moderation processes and improve operational efficiency. The system not only reduced moderation time but also promoted effectiveness, efficiency, and productivity among lecturers.

The widespread use of this system within the university will directly support the sustainable development agenda emphasized in the public sector in Malaysia. Therefore, OMS can be considered a benchmark or indicator for expanding the use of digital systems in management and administration, enhancing worker productivity, and supporting sustainable development goals.

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