



## **Transformation of quality management in higher education in South Kalimantan: Evaluation of the Educational Management Information System (EMIS)**

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### **Abstract**

*Effective integration of Educational Management Information Systems (EMIS) has become a strategic priority for higher education institutions in supporting technology-based quality management (QM) and academic governance processes. However, the success of EMIS implementation is determined not only by technological infrastructure readiness, but also by collaborative management practices and lecturers' commitment to technology use. This study aims to analyze the relationship between EMIS implementation and quality management (QM) in higher education. A cross-sectional design was employed, with data collected through a*

*web-based survey of 300 lecturers from public and private universities in Banjarmasin, Indonesia, using a snowball sampling technique. Data were statistically analyzed to examine the influence of EMIS on quality management practices and the role of lecturer attitudes toward technology. The results indicate that EMIS significantly strengthens institutional quality management, particularly in achieving organizational goals such as accreditation, certification, and systematic academic administration. Lecturers with positive attitudes toward technology perceive EMIS as more useful and effective in supporting both instructional and administrative tasks, indicating alignment between EMIS functionalities and professional demands. Moreover, commitment to technology emerges as a critical factor in maximizing institutional benefits. This study recommends the need for contextual and sustainable lecturer training and capacity building programs to ensure optimal utilization of EMIS within the framework of higher education quality assurance. Limitations include reliance on self-reported data and local contextual factors. Future research is recommended to adopt longitudinal and cross-cultural approaches to further explore the dynamic relationship between EMIS, quality management, and technological commitment in higher education.*

**Keywords:** *educational management; information systems (EMIS); quality management (QM); lecturer commitment to technology; higher education.*

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## INTRODUCTION

Education has always been fundamental for current and future generations. It teaches us much about the world and helps us understand life. Its crucial role in developing a worldview makes education a human necessity (Saif et al., 2022). The growing global need for individuals who possess not only talent but also good ethics is evidence that we live in an era where education needs to be taken very seriously (Amelia et al., 2023). As mentioned, education plays a crucial role in the production of human resources (Amelia et al., 2022; Yang, 2024). Maintaining modern educational standards is no easy task. Law Number 20 of 2003 concerning the National Education System, in Article 40 concerning Inter-Legal Arrangements, states that education can strengthen various segments of society through their active involvement in implementing and monitoring the provision of quality services (*Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*, 2003). This regulatory system is based on the idea that community participation is crucial for quality education.

Information systems have had a significant impact on education. These technological advances have not only changed work patterns but also forced people to develop strategies to face new challenges emerging in their personal and professional environments (Cha et al., 2020; González-Zamar et al., 2020; Saif et al., 2022). Such a transition in higher education is particularly observed in quality management (QM) through Educational Management Information Systems (EMIS), which enable QM implementation (Bouranta et al., 2021; Hernández et al., 2024; Mas-Machuca et al., 2021).

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Quality management refers to an organization's ongoing and systematic efforts to both improve its quality level and achieve its strategic objectives (Assarlind & Gremyr, 2016; Mas-Machuca et al., 2021). External efforts such as quality management certification and accreditation support the cultural transformation necessary to sustain systematic improvement at all levels of the organization. Good quality management encompasses robust internal quality processes and systems, coupled with effective planning and monitoring subcomponents (Langstrand et al., 2015; Parast & Safari, 2023). It also requires a strong cultural shift to commit organizational members to sustainable growth.

The COVID-19 crisis has accelerated the impact of technology on work and quality management in higher education while simultaneously strengthening the aforementioned coping mechanisms. This environment presents an interesting scenario for new studies (Chaurasia et al., 2018; González Bravo et al., 2022). However, despite the growing importance of Educational Management Information Systems (EMIS), there is still a lack of insight into the specific roles played by key stakeholders, particularly lecturers, and how they participate in managing the quality of higher education. Most research to date on teaching and learning has focused more on how institutions have implemented these new strategies and technologies at the administrative level, rather than on lecturers' understanding of the proposed systems or their commitment to using specific systems in the classroom. In particular, little research has investigated the potential of EMIS aspects to enhance teacher capabilities.

The pandemic has accelerated the development of relevant IT strategies that shape institutional goals and make higher education more resilient to prepare for future disruptions (L. Fok et al., 2023; Ozsen et al., 2023). Despite the rapid pace of digitalization that has exposed its limitations, little has been discussed in the literature regarding how EMIS can be optimized and scaled to implement educational quality management beyond administrative purposes. There is a significant need for research that informs how combining disparate administrative records with LA technology can support integrated educational planning (Barbosa et al., 2022; Jallow & Sanner, 2023). Furthermore, studies acknowledge the need for institutional digital transformation, but there is no research yet on how different levels of teacher digital readiness may moderate the success of EMIS implementation.

Technology integration offers significant benefits, but it also brings challenges, especially for schools unable to keep pace with rapid technological developments (Hashim et al., 2022). The digital divide remains significant, with educators and students lacking resources and access to necessary technological tools and training at particular risk. Similar to previous research on digital inequality based on student perspectives, this study contributes to the literature by broadening our understanding of differences in lecturers' digital competencies and their consequences for the use of EMIS for teaching and administration (González Bravo et al., 2022; Piccoli & Pigni, 2019). Failure to reduce this inequality threatens to skew the distribution of the benefits of digitalization.

Technology facilitates learning experiences and administrative effectiveness, but there is no substitute for the human dimension of education (Ozsen et al., 2023). The role of lecturers extends beyond imparting knowledge to include guidance and emotional support—factors that technology cannot replace. However, existing evidence is insufficient to address how this professional development (PD) should balance technical competency training with pedagogical strategies to prepare educators for an increasingly digital learning environment (L. Y. Fok et al., 2021). This omission highlights the importance of research on how to develop adaptable training models to foster both technological competency and sound pedagogy. Research examining perceptions and adoption of EMIS generally paints a complex picture with mixed results. Some teachers acknowledge that the systems can be effective and lead to greater efficiency and improved outcomes, while others are skeptical (Jallow & Sanner, 2023). This lack of consensus suggests that current EMIS systems may not meet the needs or expectations of educators. However, little research has been conducted to understand how EMIS can be reconfigured as tools for pedagogical purposes, rather than simply as a means of organizational efficiency. Addressing these issues is crucial for EMIS to be transformed into a system that truly helps educators and enhances students' learning experiences (Badru et al., 2022; Georgiadis, 2018) .

## **METHOD**

This study, based on a cross-sectional design, explores the relationship between EMIS, QM, and lecturers' commitment to technology in higher education. Data were collected in a cross-sectional timeframe, allowing for detailed analysis of these variables and avoiding the effects of participant behavior. This research design enabled a systematic and structured investigation of the impact of EMIS adoption on quality management initiatives and lecturers' use of technological innovations. A snowball sampling technique was applied to collect data, and a web-based questionnaire was then distributed to lecturers at a public university in Banjarmasin through the authors' networks and social media platforms without encountering any limitations. This methodology was chosen because the large number of lecturers spread across several faculties made it difficult to construct a complete sampling frame. By using snowball sampling, initial participants in this study facilitated recommendations or forwarded the questionnaire to their colleagues, thereby increasing the rapid dissemination of recruitment and allowing the researcher to reach other individuals who might otherwise be difficult to locate. The number of EMIS users who work as lecturers in this study is 300, and the frequency of use is classified into Technology Enthusiasts (code: 5 = very often), Visionaries (code: 4 = often), Pragmatists (code: 3 = sometimes), Conservatives (code: 2 = rarely) and Skeptics (code: 1 = never). For the QMAS construct, six items were used from Bravo et al., (2021) and addressed: relevance of accreditation (X1.1), objectivity of accreditation evaluation (X1.2), relevance of internal quality (X1.3), and motivation of accreditation for the education system (X1.4), value of continuous QM (X1.5), and value of participation (X1.6). Second, the

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acceptance of EMIS was evaluated by adopting an adapted UTAUT Venkatesh et al. (2012) where PEOU (X4), PU (X5), PE (X6), and FC were independent variables, and intention to use the article was the dependent variable. 1), business expectations (X2.2), social influence (X2.3), supporting conditions (X2.4), and behavioral intentions (X2.5).

Three items were taken from San Martin et al. at Badru et al., (2022): "I want to continue using EMIS" (Y1.1), "I will use EMIS" (Y1.2), and "I prefer using EMIS to manual administration systems" (Y1.3). To test the reliability and validity of the questionnaire, a pilot study was conducted with 50 respondents who were given an initial version of 36 questions. Their comments were reviewed to further develop the instrument and improve its quality before being implemented on a larger scale. This pilot study aimed to verify whether the questions were clear, relevant, and effectively measured the constructs. This study used Structural Equation Modeling (SEM) for data analysis, which investigates causal relationships between several variables by providing a set of observed indicators. We chose SEM because it is suitable for analyzing complex relationships, and its analytical results can statistically justify a model. Model fit was assessed using various SEM fit indices, including Chi-square ( $\chi^2$ ), Minimum Sample Difference Function ( $\chi^2/\text{pdf}$ ), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). These statistics, following suggestions from Ren & Toniolo (2020), maintain the integrity of the conclusions.

## **RESULTS AND DISCUSSION**

### **Results**

Educational Management Information Systems (EMIS) are crucial in the contemporary business environment. These systems, which encompass software, data management, and reporting tools, are gaining increased attention as companies seek ways to comply with complex environmental laws and become more sustainable. Combined with a range of related services, these systems are valued more highly by sustainability-oriented organizations than e-learning or general monitoring efforts. Much has been written about EMIS adoption, with studies highlighting the challenges organizations face when adopting these systems (Skittou et al., 2022). Experts also emphasize the importance of managing change and aligning with organizational strategy to fully leverage the potential benefits of EMIS implementation (Amuha & Masiero, 2022; Faraasyatul' Alam et al., 2021).

A Quality Management System (QMS) is a formal system that documents the processes, procedures, and responsibilities for achieving quality policies and objectives. Extensive research has been conducted on the ISO 9000 series of standards, particularly ISO 9001:2015 for QMS. These benchmarks can be used to measure quality and customer satisfaction, as well as quality improvement. Studies have examined the adoption and outcomes of ISO standards in organizations, focusing on their impact on various measures of organizational performance. Beyond ISO standards, the literature extends to Total Quality Management (TQM) as a

comprehensive quality excellence approach (Sallis, 2014). TQM leads to a transformation of organizational culture in which every employee participates in quality improvement. Many researchers have studied the relationship between successful QMS implementation and organizational performance and found that it increases organizational productivity, which in turn increases customer satisfaction, reduces defects, and leads to competitive advantage (L. Fok et al., 2023; Suriansyah, 2017).

The use of university material resources, such as the availability of library books or laboratory equipment, can also be managed by information systems. Regarding correspondence and information, these systems offer student portals and open email channels between students, faculty, and university staff. Furthermore, managing valuable academic and administrative activities facilitated by information systems offers significant advantages for in-depth data analysis and reporting to understand academic and administrative trends. Data security and privacy are crucial, and robust security measures and appropriate access rights must be maintained. With these capabilities, information systems contribute to the efficiency, transparency, and quality of higher education.

Table 1. Summary of QMAS compared to EMIS

Connection	Estimation	S.E.	C.R.	Conclusion
QMAS → CC	0.351	0.052	6.760	Important
EMIS → CC	0.456	0.056	8.195	Important
QMAS → EMIS	0.696	0.029	24.149	Important

Based on Table 1, it can be seen that:

- 1) The Quality Management System (QMAS) factor significantly influences lecturers' continuance commitment (CC), with a magnitude of 3.5%.
- 2) The Educational Management Information System (EMIS) factor significantly influences lecturers' continuance commitment, accounting for 45.6% of the variance in this relationship.
- 3) The Quality Management System (QMAS) factor significantly influences the Educational Management Information System (EMIS). The influence of QMAS on EMIS is assessed at 9.5%.

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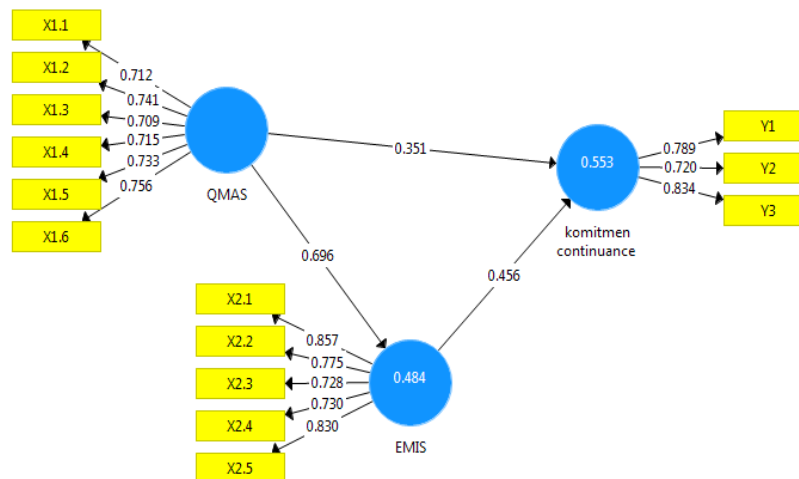


Figure 1. R-Square Acquisition

Table 2. Coefficient of determination (R-squared) and adjusted R-squared values for the research variables

	R Square	Adjusted R-Squared
X2- EMIS	0,484	0,482
Commitment to sustainability Y	0,553	0,55

The findings of this study have broad implications for higher education in the post-pandemic world. It appears that QMAS and EMIS must be interconnected in a rapidly changing educational environment, with QMAS integrated into schools. This, in turn, can lead to better resource allocation, meet accreditation goals, and improve the quality of teaching and learning (Barbosa et al., 2022). Furthermore, tailored training is crucial in ensuring faculty engagement and commitment. Staff development programs need to be adapted to meet the varying needs and levels of technology experience that faculty bring to professional development programs. Cultural influences are also important factors influencing attitudes about quality management and technology acceptance (L. Y. Fok et al., 2021). Understanding these determinants is crucial for tailoring successful and inclusive interventions. Regarding R-Square, here's what we know about the company.

The results of this study provide further understanding of the configuration of the relationship between Quality Management Factors (QMAS), Educational Management Information Systems (EMIS), and lecturers' continuance commitment (CC) in higher education. The R-squared ( $R^2$ ) value of the statistical model indicates how well one variable explains another. For EMIS, the  $R^2$  coefficient is equal to 0.484, and the adjusted  $R^2$  value is 0.482, meaning that QMAS explains approximately 48.2% of the variation in EMIS. These findings highlight the importance of quality management in the adoption and success of information systems in universities. Optimization of processes and process outcomes is based on quality management. In these institutions, EMIS is well-received because it serves as a means of linking technological infrastructure with institutional goals (Badru et al., 2022; Georgiadis, 2018).

Lecturers' continuance commitment was also influenced by QMAS and EMIS, with  $R^2 = 0.553$ , and an adjusted  $R^2$  of 550%. This means that the combined effect of QMAS and EMIS can explain 55% of the variance in lecturers' continuance commitment. This strong influence emphasizes the close relationship between institutional quality management, technological hyperconnectivity, and social capacity. Quality management tends to create a sense of security and confidence in academic staff, and EMIS provides an instrument to reduce administrative burden and increase efficiency (Martins et al., 2019; Stamenkov & Zhaku-Hani, 2023). Together, these variables create a climate that supports professional commitment and retention in the higher education sector.

## **Discussion**

EMIS and QMAS collaborate in the education sector to collect information, assess performance, and encourage the delivery of quality education by institutions. Their interaction contributes to a culture of sustainable development in education. 24 This latter issue requires appropriate information system solutions by both universities and the students involved (Danso et al., 2021). Through the implementation of this application, universities can now efficiently handle academic operations such as student registration, class scheduling, and class ranking monitoring, as well as academic transcript generation. Furthermore, this system also improves student financial operations, including monitoring tuition payments and better scholarship management (Khamdamov et al., 2021).

The results of this study emphasize that the factors of quality management (QMAS), Educational Management Information System (EMIS), and CC are strongly related to the creation of added value in quality education and the integration of technology in education; this also strengthens the integration of quality management and technology factors in higher education. The results of the first hypothesis indicate that QMAS has a significant impact on lecturers' continuance commitment, accounting for 35.1% of the variance. This suggests that strong quality management supports an empowering culture and benefits lecturer retention. Previous research has focused on the role of quality management systems in enhancing organizational sustainability through the establishment of professional development and accountability structures (L. Fok et al., 2023; Ozsen et al., 2023). As far as Indonesian higher education is concerned, these results emphasize culturally sensitive quality management practices that respond to local conditions and create adaptive evidence for global demands.

EMIS had a significant impact on lecturers' ongoing commitment, at 45.6 percent. This finding is consistent with recent studies highlighting the value of technology integration in contemporary education. Information systems optimize administrative workflows, reduce workloads, and provide more effective communication, which impacts lecturer engagement and satisfaction (González Bravo et al., 2022). In Indonesian universities, this conversion can enable peak performance and regulatory compliance, especially when accreditation and certification processes are resource-intensive. However, the success of EMIS depends on user

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acceptance and appropriate training. Utilization and professional commitment to EMIS can be enhanced not only through appropriate system use but also through targeted training programs tailored to lecturers' computer literacy levels (Danso et al., 2021; Kubiavka et al., 2023; Ye, 2022).

The relationship between QMAS and EMIS resulted in QMAS explaining 9.5% of the variance in EMIS adoption, which still reflects the reliance on the strengths and weaknesses of the quality management system supported by information technology. Organizations with strong quality systems are better positioned for successful EMIS implementation because quality management provides the necessary structure to align technological objectives with institutional goals. Integrating quality management technology for efficient and sustainable operations in the long term (Bhatti et al., 2013; Danso et al., 2021). Furthermore, EMIS supports quality assurance with instant information and analysis that enables continuous improvement and compliance with global benchmarks such as ISO 21001. At the same time, this can be seen as a chicken-and-egg relationship, suggesting that multiple integration factors are involved in institutional strengthening and development to support quality management and ICT innovation (Khamdamov et al., 2021).

While the QMAS explains most of the variation in EMIS, approximately 51.8% of the variability remains unexplained. This suggests that other intermediary variables, such as organizational culture, leadership, and funding, may mediate the success of EMIS implementation. Leadership is key to technology adoption because it supports changes in faculty attitudes and effectively provides resources. Furthermore, cultural barriers (e.g., resistance to change) and differences in digital literacy levels among faculty can prevent optimal EMIS use. These barriers cannot be addressed solely with traditional technical training but require a multifaceted approach that includes training in cultural change management and leadership (Bravo et al., 2021).

Faculty continuance commitment also showed a similar pattern, with the QMAS and EMIS having a strong impact, with an adjusted  $R^2$  of 0.550. However, this only explained 45% of the variance, suggesting other variables may be at play here—such as job satisfaction, career growth opportunities, and work-life balance. Involvement in career-focused professional development activities may have a greater impact on commitment depending on how they relate to faculty career expectations. Institutional policies that encourage work-life balance (flexible work hours, remote teaching) can also improve faculty retention and engagement (Martins et al., 2019).

The moderating role of QMAS on the influence of EMIS on continuance commitment. For example, lecturers' perceptions of quality management practices significantly influence their intention to use technology systems such as EMIS. This mutually reinforcing relationship aligns with the conclusion that quality management and technology systems mutually support institutional success. Practically, this implies that institutions should not view quality management and EMIS as separate endeavors, but rather as complementary assets for an

impressive education system (Gupta & Jawanda, 2020). QMAS and EMIS have a central influence on lecturers' continued commitment in higher education institutions, with substantial explanatory power as indicated by the  $R^2$  values. However, the unexplained variability highlights the need to continue exploring additional factors that may influence this relationship. This study warrants further research focusing on institutional culture, leadership, and external pressures, and comparative studies (both national and international) based on more robust qualitative approaches that can provide better insights into lecturers' perceptions. Filling this gap will help create a more holistic strategy in higher education to improve quality, technology implementation, and faculty engagement in the post-pandemic period (Amelia et al., 2024; Sari et al., 2023).

The critical interplay between quality management and EMIS adoption. This study highlights that quality management and EMIS adoption are important motivators for lecturers to continue using the system, particularly in terms of assisting with the accreditation process. These findings reinforce the symbiosis between technology and quality in higher education. The findings of this extensive study have broader implications for post-pandemic educational recovery (Amelia et al., 2022; Lukinbeal, 2022). Identifying lecturer profiles provides useful information for developing personalized training and support interventions to encourage technology adoption. This knowledge is expected to make a strong contribution to the quality of education post-COVID-19, amidst the challenges lecturers face, so that higher education institutions (HEIs) can be prepared to deliver high-quality education in a rapidly changing teaching and learning landscape.

The Role of EMIS in Quality Management in Higher Education plays a crucial role in supporting quality management in higher education. EMIS can offer information and perspectives on key aspects of an institution's performance, including student enrollment size, graduation rates, faculty workload, and research productivity (L. Y. Fok et al., 2021). This information can help identify areas for improvement and monitor progress over time. EMIS can serve as a tool that helps implement quality management processes—self-evaluation, peer review, continuous improvement, etc.—by facilitating these processes. MIS data, for example, can be used to track students' progress as they participate in various programs, identify students at risk of dropping out, and develop appropriate individualized interventions for those students (Kooli & Abadli, 2022; Madani, 2019).

## **CONCLUSION**

This study explores the dynamics of how EMIS interacts with lecturers' QMS and SCM towards technology use in higher education. Through questionnaires administered to 300 lecturers at various universities in Indonesia, the study found a diverse profile of lecturers, consisting of technology enthusiasts, visionaries, pragmatists, conservatives, and skeptics using a seven-point Likert scale. This diversity demonstrates a dynamic continuum of acceptance and resistance to EMIS adoption, which is important for understanding lecturers'

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drivers and barriers. The results indicate that technology enthusiasts and visionaries are key facilitators in driving EMIS adoption, recognizing its potential to improve the quality of service (QMS) and aligning it with accreditation standards. Furthermore, the study also shows that robust QMS practices and efficient use of EMIS play a crucial role in supporting and improving the quality of higher education in the face of changing requirements.

Furthermore, to align with the Independent Learning–Independent Campus (MBKM) framework, universities are required to implement adaptive digital platforms that support accountability and transparency and achieve continuous improvement in academic and non-academic activities. From a practical perspective, this study highlights the importance of specialized training and capacity-building programs to meet the needs of lecturers with diverse adoption profiles. Measures such as Personnel Training Workshops, peer mentoring, and incentive-based mechanisms can accelerate broader EMIS adoption while fostering a digitally innovative climate. Creating such an environment will enhance Internal Quality Management processes and enforce compliance with national higher education regulations, ensuring institutional viability. However, this study acknowledges limitations, including the spectrum of generalizability (due to the small sample of universities recorded). Furthermore, cultural and organizational factors influencing lecturers' attitudes toward EMIS have not been well-researched. Future research could consider a range of institutional arrangements to gain a broader, general perspective, as well as consider a longitudinal approach to measure the ongoing implications of EMIS adoption to provide a more accurate understanding of the role of technology in transforming governance and quality assurance at the higher education level.

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