

The Influence of Digital Literacy on the Information Technology Risk Management Capabilities of Lecturers at Private Universities in Bandung City

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Abstract

Digital transformation in higher education has increased the use of information technology in various academic activities. On the other hand, this development has also given rise to various information technology risks that require adequate management skills from faculty members as the primary users of digital technology. This study aims to analyze the influence of digital literacy on information technology risk management capabilities among faculty members at private universities in Bandung. The results indicate that faculty members' levels of digital literacy and information technology risk management capabilities fall into the high category. Data analysis reveals a strong positive correlation between digital literacy and information technology risk management capabilities. Digital literacy has been shown to have a positive and significant impact on faculty members' ability to identify, analyze, mitigate, and monitor information technology risks. These findings indicate that improving digital literacy can strengthen lecturers' ability to address various risks arising from the use of digital technology in the higher education environment. Therefore, enhancing digital literacy competencies should be part of human resource development strategies to support safe, effective, and sustainable digital transformation in higher education.

Keywords: Digital Transformation, Digital Literacy, IT Risk Management, Data Security, Private Universities

INTRODUCTION

Digital transformation has become a major driver of change across various sectors, including higher education (Dunggio, 2025). The adoption of information technology in higher education institutions has increased significantly, particularly following the COVID-19 pandemic, which accelerated the widespread implementation of digital technologies in teaching and learning, research, community service, and academic administration. Various technological innovations, such as Learning Management Systems (LMS), cloud computing, artificial intelligence (AI), big data, and digital collaboration platforms, have been integrated into a wide range of academic activities. This situation requires lecturers, as the primary executors of the three pillars of higher education (Tri Dharma Perguruan Tinggi), to optimize the effective use of technology in fulfilling their professional responsibilities.

The utilization of digital technology in Indonesia continues to show substantial growth. According to the National Digital Literacy Index Survey conducted by the Ministry of Communication and Informatics, Indonesia's digital literacy index is classified as moderate, with a score of 3.54 out of 5. Nevertheless, the digital safety dimension received a lower score than the other dimensions. This finding indicates that although technology adoption has increased, it has not been fully accompanied by adequate public capability to maintain digital security and manage the various risks associated with the use of digital technologies.

Alongside the rapid advancement of digital technologies, cybersecurity threats have also intensified. The National Cyber and Crypto Agency (Badan Siber dan Sandi Negara—BSSN) reported more than 102 million cyber traffic anomalies in Indonesia between January and July 2024. This finding demonstrates that information security challenges are becoming increasingly

complex and may significantly affect various sectors, including higher education, which has become highly dependent on information technology for academic operations. Potential risks include personal data breaches, loss of academic data, cyberattacks, information misuse, system disruptions, and violations of digital ethics.

Therefore, the success of digital transformation depends not only on the availability of adequate technological infrastructure but also on the readiness of human resources to manage the associated risks. Consequently, lecturers are expected not only to utilize information technology effectively but also to possess the capability to identify, analyze, mitigate, and monitor the various risks arising from the use of digital technologies. This capability is commonly referred to as Information Technology Risk Management Capability (ITRMC). Information technology risk management capability refers to an individual's ability to recognize potential threats, assess the level of risk, and implement appropriate control measures to minimize the adverse impacts of technology utilization. Lecturers with strong information technology risk management capabilities are better equipped to use technology safely, effectively, and responsibly, thereby supporting the successful implementation of the Tri Dharma of higher education.

In the era of digital transformation, digital literacy is no longer regarded as an additional skill but rather as a fundamental competency that every lecturer must possess. Strong digital literacy enables lecturers to understand the characteristics of digital information, evaluate the credibility of information sources, safeguard personal and institutional data, and utilize technology ethically and responsibly. These competencies are believed to help lecturers anticipate and manage various risks associated with information technology usage. Therefore, digital literacy has the potential to become a critical factor in enhancing information technology risk management capability within increasingly digitalized higher education environments.

Based on the foregoing discussion, investigating the influence of digital literacy on the information technology risk management capability of lecturers at private higher education institutions is both relevant and necessary. Although numerous studies have examined information technology risk management at the organizational level, research focusing on individual lecturers' information technology risk management capability remains relatively limited, particularly within private higher education institutions. The findings of this study are expected to provide empirical evidence regarding the relationship between digital literacy and information technology risk management capability, while also serving as a valuable reference for higher education institutions in designing digital competency development programs for lecturers to support secure and sustainable digital transformation.

DIGITAL LITERACY

Digital literacy refers to an individual's ability to access, understand, evaluate, utilize, and create information through digital technologies effectively and responsibly. This capability has become one of the essential competencies required to support digital transformation in higher education. According to Kurniawati et al. (2021), digital transformation in higher education requires not only the availability of technological infrastructure but also the readiness of human resources to optimize the use of technology in supporting educational processes.

The development of digital literacy in Indonesia has shown a positive trend. According to the 2025 Indonesian Digital Society Index (Indeks Masyarakat Digital Indonesia—IMDI), the national digital literacy score reached 44.53, representing an improvement compared to the previous year. The survey also identified higher education institutions as one of the primary drivers of enhancing the digital competencies of Indonesian society. Nevertheless, several challenges remain, including limited technological infrastructure and the need to further strengthen the digital competencies of the academic community. Within the context of higher education, lecturers play a strategic role as agents of digital transformation. Adriansyah and

Rahmayati (2023) found that digital literacy has a positive influence on lecturers' work productivity in responding to the demands of the Society 5.0 era. Their findings indicate that higher levels of digital literacy enable lecturers to perform academic responsibilities more effectively through the use of digital technologies.

In addition to enhancing productivity, digital literacy also contributes to improving lecturers' ability to manage various risks associated with the use of information technology. Solehuddin et al. argued that strengthening digital literacy through the active engagement of lecturers can enhance the digital competencies of the academic community, thereby promoting the effective, secure, and responsible use of digital technologies. Such competencies are increasingly important given the growing threats related to information security, data misuse, and other operational risks accompanying digital transformation in higher education institutions. Based on the preceding discussion, digital literacy is considered a key factor that may influence lecturers' Information Technology Risk Management Capability (ITRMC). Therefore, this study aims to examine the influence of digital literacy on the information technology risk management capability of lecturers at private higher education institutions.

INFORMATION TECHNOLOGY RISK MANAGEMENT

Information Technology Risk Management (ITRM) is a systematic process of identifying, analyzing, evaluating, and controlling risks arising from the use of information technology within an organization. In higher education institutions, information technology has become a critical component supporting academic, administrative, research, and student service activities. The increasing adoption of information systems has generated substantial benefits in terms of efficiency, effectiveness, and service quality. However, it has also introduced various threats that may disrupt institutional operations. System failures, data loss, information breaches, unauthorized access, and cyberattacks are among the risks that may hinder the achievement of organizational objectives. Therefore, higher education institutions must implement structured information technology risk management practices to anticipate and minimize the negative impacts of these risks.

From the perspective of ISO 31000:2018, risk management extends beyond technical considerations by incorporating organizational scope, context, and risk criteria as the foundation of the risk management process. Understanding both the internal and external organizational context is essential because each business activity possesses distinct risk characteristics depending on the systems and data involved. Information technology risks in higher education are inherently context-aware and strategy-driven, meaning that identical activities may produce different levels of risk depending on the institution's strategic objectives and priorities. Consequently, IT risk assessment should be conducted comprehensively by considering the interrelationships among organizational activities, business strategies, risk characteristics, and their potential impacts.

According to Vigim et al. (2021), risk management is a structured process encompassing risk identification, measurement, mapping, the development of risk treatment alternatives, and continuous risk monitoring. Within higher education information systems, risks may emerge in the form of academic, operational, and financial risks. Academic risks include grade manipulation, unauthorized modification of graduation records, and misuse of learning management systems. Operational risks involve data breaches, malware attacks, network misuse, website hacking, and service disruptions caused by server downtime. Financial risks may arise from transaction manipulation, unauthorized modification of payment records, and misuse of institutional financial information. These challenges highlight that effective IT risk management is essential for maintaining the confidentiality, integrity, and availability of information within higher education institutions.

Furthermore, Maulana (2026) classified information technology risks in higher education into five primary dimensions: data, integrity, privacy, availability, and system. These dimensions provide the foundation for assessing risk levels and determining appropriate mitigation strategies. Accordingly, the successful implementation of IT risk management depends not only on the technologies employed but also on the capability of human resources to understand, identify, and respond effectively to emerging threats. Within the higher education context, improving lecturers' digital literacy is considered a crucial factor in strengthening Information Technology Risk Management Capability (ITRMC), as lecturers are among the primary users of information technology in carrying out the three core missions (Tri Dharma) of higher education institutions.

RESEARCH METHODOLOGY

This study employed an explanatory quantitative approach to examine the relationship between variables, specifically the influence of digital literacy on the information technology risk management capability of lecturers at private higher education institutions. The study population consisted of full-time lecturers from several private higher education institutions in Bandung, Indonesia. The sample was selected using a simple random sampling technique to ensure that every member of the population had an equal opportunity to be chosen as a respondent. Data were collected through a structured questionnaire using a five-point Likert scale, and the instrument was tested for both validity and reliability before data collection.

The independent variable (X), digital literacy, was measured using indicators related to lecturers' ability to use digital technologies, evaluate digital information, ensure digital security, and utilize technology-based learning platforms. The dependent variable (Y), Information Technology Risk Management Capability (ITRMC), was measured using indicators covering information technology risk identification, risk analysis, risk mitigation, and risk monitoring. Data analysis consisted of validity testing, reliability testing, and classical assumption tests prior to hypothesis testing. The relationship between the independent and dependent variables was analyzed using simple linear regression analysis.

RESULTS AND DISCUSSION

Before testing the research hypothesis, the data were analyzed through validity testing, reliability testing, and classical assumption testing. The results are presented as follows.

A. Validity Test

The validity test was conducted using the Pearson Product-Moment correlation, which measures the correlation between each questionnaire item and the total score (Corrected Item–Total Correlation). With a sample size of 48 respondents, the critical value of the correlation coefficient (r-table) at a significance level of $\alpha = 0.05$ was ± 0.284 .

The results indicate that all questionnaire items have correlation coefficients greater than the critical r-table value. Since all calculated correlation coefficients (r-calculated) ranged from 0.602 to 0.879, exceeding the r-table value of 0.284, all measurement indicators were considered valid and were therefore suitable for subsequent statistical analyses.

B. Reliability Test

The reliability of the research instrument was assessed using Cronbach's Alpha.

Table 1. Reliability Test Results

Variable	Cronbach's Alpha	Reliability Level
Digital Literacy (X)	0,944	Excellent Reliability
Information Technology Risk Management (Y)	0,947	Excellent Reliability
Overall Instrument	0,962	Excellent Reliability

The Cronbach's Alpha coefficients for all variables exceeded the recommended threshold of 0.70, indicating that the research instrument demonstrated excellent internal consistency. Therefore, the questionnaire was considered reliable and appropriate for data collection.

C. Classical Assumption Tests

Since this study employed simple linear regression analysis, classical assumption tests were conducted to ensure that the regression model met the required statistical assumptions. The tests included normality and heteroscedasticity assessments.

- Normality Test: The normality of the regression residuals was evaluated using the Shapiro–Wilk test.

Table 2. Normality Test Results

Statistic	Value
Shapiro–Wilk	0,976
p-value (Sig.)	0,423

The Shapiro–Wilk test yielded a significance value ($p = 0.423$), which was greater than 0.05, indicating that the regression residuals were normally distributed. Accordingly, the normality assumption was met.

- Heteroscedasticity Test: The presence of heteroscedasticity was examined using the Breusch–Pagan test.

Table 3. Heteroscedasticity Test Results

Statistic	Value
Chi-Square	0,272
p-value (Sig.)	0,602

The heteroscedasticity test produced a significance value of 0.602, which exceeded the threshold of 0.05, indicating that no heteroscedasticity was present in the regression model.

Based on the validity test results, all research indicators demonstrated item–total correlation coefficients greater than the critical r-table value (0.284), indicating that all questionnaire items were valid. The highest correlation coefficient was observed for the risk identification indicator (0.879), while the lowest coefficient was 0.602, which remained well above the minimum validity threshold.

The reliability analysis yielded Cronbach's Alpha coefficients of 0.944 for the Digital Literacy variable and 0.947 for the Information Technology Risk Management variable. Both values substantially exceeded the recommended minimum threshold of 0.70, indicating that the research instrument possessed excellent internal consistency.

The classical assumption tests confirmed that the regression model satisfied the required statistical assumptions. The normality test produced a significance value of 0.423 ($p > 0.05$), indicating that the regression residuals were normally distributed. Furthermore, the heteroscedasticity test yielded a significance value of 0.602 ($p > 0.05$), confirming the absence of heteroscedasticity. Since all classical assumptions were satisfied, the regression model was deemed appropriate for examining the influence of digital literacy on the Information Technology Risk Management Capability (ITRMC) of lecturers at private higher education institutions.

Respondent Characteristics

The study involved 48 lecturers from private higher education institutions in Bandung, Indonesia. The respondents represented diverse academic disciplines, age groups, and teaching experience, thereby providing a representative overview of the levels of digital

literacy and Information Technology Risk Management Capability (ITRMC) within the higher education environment.

Descriptive Analysis of the Variables

The descriptive analysis revealed that the lecturers' digital literacy was at a high level, with a mean score of 4.39 on a five-point Likert scale. Similarly, the Information Technology Risk Management Capability (ITRMC) variable recorded a mean score of 4.08, which also falls within the high category.

Table 4. Descriptive Statistics

Variable	Mean	Standard Deviation	Category
Digital Literacy (X)	4,39	0,63	High
Information Technology Risk Management Capability (Y)	4,08	0,62	High

These findings suggest that the majority of lecturers have developed strong competencies in using digital technologies, evaluating digital information, maintaining digital security, and utilizing technology-enhanced learning platforms. Moreover, they demonstrated a high level of capability in identifying, analyzing, mitigating, and monitoring risks arising from the digital transformation of higher education.

Analysis of the Relationship Between Digital Literacy and Information Technology Risk Management Capability

The results of the Pearson correlation analysis revealed a correlation coefficient of $r = 0.719$ with a significance level of $p < 0.001$. These results indicate a strong positive relationship between digital literacy and Information Technology Risk Management Capability (ITRMC) among lecturers at private higher education institutions.

Tabel 5. Pearson Correlation Analysis Results

Variables	Correlation Coefficient (r)	p-value (Sig.)
Digital Literacy → Information Technology Risk Management Capability	0,719	0,000

The correlation coefficient indicates that higher levels of lecturers' digital literacy are associated with greater Information Technology Risk Management Capability (ITRMC). In other words, improvements in digital literacy are accompanied by enhanced capabilities in identifying, analyzing, mitigating, and monitoring risks associated with the use of information technology in higher education.

Simple Linear Regression Analysis

The results of the simple linear regression analysis produced the following regression equation:

Where:

- Y = Information Technology Risk Management Capability (ITRMC)
- X = Digital Literacy

Table 6. Simple Linear Regression Results

Variable	Coefficient (β)	t-value	p-value (Sig.)
Constant	0,969	2,167	0,035
Digital Literacy	0,708	7,018	0,000

The regression coefficient of 0.708 indicates that each one-unit increase in digital literacy is associated with a 0.708-unit increase in Information Technology Risk Management Capability (ITRMC).

The coefficient of determination (R^2) was calculated as 0.517, indicating that 51.7% of the variance in Information Technology Risk Management Capability (ITRMC) can be explained by lecturers' digital literacy, while the remaining 48.3% is attributable to other factors not examined in this study.

The findings demonstrate that digital literacy has a positive and statistically significant effect on Information Technology Risk Management Capability (ITRMC) among lecturers at private higher education institutions in Bandung. These results indicate that lecturers with higher levels of digital literacy are better equipped to identify, analyze, mitigate, and monitor risks arising during the implementation of digital learning. The research instrument measured technical competence, information literacy, digital ethics, and digital security as dimensions of digital literacy, while Information Technology Risk Management Capability was assessed through four dimensions: risk identification, risk analysis, risk mitigation, and risk monitoring.

From a theoretical perspective, these findings support Paul Gilster's concept of digital literacy, which emphasizes that digital literacy extends beyond the ability to operate technology to include the capacity to understand, evaluate, and effectively utilize digital information. Such competencies constitute essential resources for lecturers in addressing various information technology risks, including failures of online learning systems, information security threats, data misuse, and low levels of student participation in digital learning environments.

The correlation coefficient of 0.719 indicates a strong positive relationship between digital literacy and Information Technology Risk Management Capability. This finding suggests that lecturers who are more proficient in operating digital learning technologies, verifying digital information, and implementing information security practices are more capable of managing risks within digital education environments. This relationship is particularly relevant in the context of higher education's digital transformation, which increasingly depends on Learning Management Systems (LMS), cloud computing, and various online learning applications.

The coefficient of determination ($R^2 = 51.7\%$) further indicates that digital literacy is one of the primary determinants of Information Technology Risk Management Capability. Nevertheless, 48.3% of the variance remains unexplained, suggesting that additional factors may also influence lecturers' risk management capabilities. These factors may include organizational support, institutional information security policies, organizational culture, information technology competence, digital leadership, and the availability of technological infrastructure. The findings are consistent with the study by Adriansyah et al. (2023), which reported that improving digital literacy contributes to enhanced effectiveness and productivity among lecturers in responding to technological developments in education. Furthermore, the results support the ISO 31000 risk management framework, which emphasizes the critical role of human resource competencies in the processes of risk identification, risk analysis, and risk treatment.

Based on respondents' open-ended responses, the primary challenges in improving digital literacy include limited technological skills, the rapid pace of technological change, insufficient continuous professional training, and inadequate technical support in several institutions. Therefore, higher education institutions should strengthen lecturers' competencies through cybersecurity training, digital literacy workshops, digital competency certification programs, and the development of more comprehensive information technology governance policies.

Research Implications

1. Higher education institutions should incorporate digital literacy into their lecturers' professional competency development programs.

2. Information security and information technology risk management training should be conducted on a regular basis.
3. Strengthening information technology governance can improve institutional readiness to address risks associated with digital transformation.
4. Digital literacy can serve as a preventive strategy for reducing operational risks in technology-enhanced learning environments.

CONCLUSION

This study demonstrates that digital literacy is a significant determinant of Information Technology Risk Management Capability (ITRMC) among lecturers at private higher education institutions. The findings indicate that the higher the level of lecturers' digital literacy, the greater their capability to identify, analyze, mitigate, and monitor risks associated with the use of information technology in academic activities. Specifically, proficiency in digital technologies, the ability to critically evaluate digital information, and a strong understanding of digital security contribute substantially to enhancing lecturers' Information Technology Risk Management Capability.

Accordingly, strengthening digital literacy should become a strategic priority within lecturers' professional development programs to ensure that digital transformation in higher education is implemented in a secure, effective, and sustainable manner. Furthermore, higher education institutions should reinforce institutional support through continuous professional training, comprehensive information security policies, and integrated information technology governance frameworks to enhance lecturers' preparedness for addressing emerging digital risks.

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