# MOJEM 2

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**Kaizen Internal Quality Assurance Adoption and Quality Performance Improvement in Indonesian Higher Education Institutions: The Moderating Role of IT Development**


## ABSTRACT

In 2018, strengthening Higher Education Institution (HEI), governance began to be promoted again by the Indonesian government after its first initiation in 2003. In so doing, the Indonesian government has adopted a new internal quality assurance framework for HEI, namely Kaizen method, which emphasizes the quality improvement process. In addition, the government recommended the development of IT advancement to support management practices at the HEI, including internal quality assurance. However, to this day, related research that examines the extent to which these policies contribute to HEI quality performance improvement still needs to be improved. To meet the gap, the current study examined the Kaizen internal quality assurance implementation role on HEI quality performance by testing the IT development as a moderator. Using data from 191 HEI samples obtained from 31 of 34 provinces in Indonesia, the relationship between variables was tested by employing the Partial Least Square (PLS) technique. The results show that the Kaizen internal quality assurance implementation is positively associated with HEI quality performance, where IT development strengthens the relationship (moderated). However, since the direct relationship between IT development and HEI quality performance is also significant, thus, the moderating role of IT development is quasi in nature. The results provide new insights regarding the contributions of internal quality assurance reform supported by IT development to the HEI quality performance. Specifically, the study affirms the role of IT as a moderator.



Keywords: Information Technology; Internal Quality Assurance; Higher Education Institution; Quality Performance; Moderator


## INTRODUCTION

Many higher education institutions (HEIs) around the world still have serious concerns about quality today. The quality concerns arise since international and national competition on HEI in the world is getting higher due to an era of university global ranking (Fernandes & Rinaldo, 2018; Tjahjadi et al., 2019). Sauder and Espeland (2009, p. 80) claim that "Rankings are part of a global movement redefining accountability, transparency, and good governance in quantitative measures". Apart from controversy and debate (see: Kallio & Kallio, 2014; Olssen & Peters, 2005), global ranking and accreditation are considered a manifestation of the quality of HEI currently. On the other hand, it is generally accepted that the ability of all countries to effectively develop their human resource through education determines their ability to have a sustainable economic future. (Dill, 2009).

Demand for good-quality HEI triggers universal changes in management and governance practices at HEI, especially regarding quality assurance (Mok, 2005). Many countries have begun to revise their regulations related to HEI's quality control (Blanco-Ramírez & B. Berger, 2014; Chu & Westerheijden, 2018; Das & Mukherjee, 2017; Noaman et al., 2017). For instance, the majority of European countries adopt European Standards and Guidelines (ESG) formulated by The European Association for Quality Assurance (ENQA) as Standards and guidelines for assessing the quality of higher education in Europe, which constitute the main framework for quality assurance systems

all over Europe (Santos & Dias, 2017). To follow these global changes in HEI quality improvement, the Indonesian government has undertaken several initiatives through the Ministry of Education and Culture (see Table 1).

Table 1
*Significant Milestones in the Indonesian HEI Management and Governance Reform*

| No | Year | Initiatives |
|---|---|---|
| 1 | 2003 | Quality assessment (Accreditation) |
| 2 | 2009 | Quality Assurance System for Education Institution |
| | | Internal Control System at HEI |
| 3 | 2010 | Management and governance reform |
| 4 | 2011 | Internal Control System at HEI (Amendment) |
| 5 | 2012 | New Accreditation System for HEI |
| 6 | 2014 | National Standard for Higher Education (Amendment) |
| | | Management and governance reform (Amendment) |
| 7 | 2016 | Internal Quality Assurance System for HEI by adopting Kaizen method (Amendment) |
| 8 | 2018 | Internal Quality Assurance Guidance for HEI by adopting the Kaizen method |
| | | Government recommendation to advance IT development for management and governance practices improvement |
| 9 | 2019 | New accreditation standard for HEI (Outcome-based perspective) |

In 2003, the Indonesian government first concentrated on implementing the accreditation system as a quality assessment strategy for internal and external quality assurance. External quality assurance is carried out by using an audit approach in which a national accreditation body for HEI is tasked with assessing the quality of HEI, covering five aspects: strategic planning, academic, organizational resources (physical, human, financial), and governance. To ensure the five aspects of fulfillment, the HEI was recommended to build an internal quality assurance unit. Meanwhile, in the same year, internal quality assurance was only required, but no complementary rules explained how it should be implemented in detail. As a result, although internal quality assurance is already implemented mandatory, the Indonesian government reported that out of 4,529 Indonesian HEIs, only 1,223 (27.00%) had submitted accreditation assessment for institutional level with the following results: 59 (4.82%) got "A", 441 (36.06%) got "B" and 723 (59.12%)[1] HEIs got "C". Moreover, only a few departments are currently internationally accredited or certified by international bodies, such as AACSB, AMBA, ABET, and AUN-QA (www.forlap.dikti.go.id, 2019). According to various literature, poor design or implementation may be the cause of ineffective and low benefit of control policies to the organizations – for example, poor performance measurement system and poor management controls system (see Akbar et al., 2012; Brusca & Montesinos, 2013; Mimba et al., 2013), but in this case is poor internal quality assurance. To tackle the weaknesses of internal quality assurance in HEI and improve its implementation, the Indonesian government adopted a Kaizen method as a new framework for HEI internal quality assurance with the paradigm of continuous quality improvement. The government also launched an internal quality assurance guidance in 2018 so that the management of HEIs can understand how the Kaizen concept is implemented.

[1] Percentage is calculated based on all HEIs that have already submitted accreditation assessment.

Furthermore, some literature have proposed that IT development is pivotal to promoting effective control policy, in this case, quality assurance implementation, that subsequently contributes to the HEI quality performance pivotal (see: AICPA, 2014; Caoa et al., 2017; COSO, 2013; ICAF & CIPFA, 2014; Klamm & Watson, 2009; Mazza & Azzali, 2016; Rubino et al., 2017; Zhang et al., 2007). Haris et al. (2017) argue that IT helps Quality Assurance Board to collect effectively, process, present, and monitor various data related to the quality management process and performance achievement of HEIs. At the same time, Elhoseny et al. (2017) contend that the need for accurate decision-making in terms of quality standards fulfillment and performance indicators achievement through internal quality implementation could be made quickly and adequately if it is supported by IT. By 2008, the Indonesian government had advised all HEIs to upgrade their IT to assist all management and governance aspects, including HEI control policies. (www.ristekdikti.go.id, 2018)[2]. However, research investigating IT development's role in supporting internal quality assurance in Indonesian HEIs is still lacking.

On the other hand, the majority of studies on HEI quality assurance focused on the following issues: quality measurement model and framework (Ashraf et al., 2016; Tsinidou et al., 2010), the history of HEI quality assessment approach and its development (Chu & Westerheijden, 2018), stakeholders' perceptions toward HEI quality (Dicker et al., 2019; Lapina et al., 2016; Pham & Starkey, 2016), and the HEI quality improvement model with specific analytical techniques (Das & Mukherjee, 2017; Noaman et al., 2017; Venkatraman, 2007). Meanwhile, prior studies on HEI management and governance changes issues have discussed more the political, historical, and principle aspects (see: Kretek et al., 2013; Wardhani et al., 2019) rather than how the changes contribute to HEI quality improvement. Today, changes in HEI governance policies, such as the new framework of internal quality assurance, performance measurement systems, and IT development, have become current research areas. However, they have not received much attention from academics, especially in developing countries context, such as Indonesia. Research is urgently needed to provide empirical evidence to what extent these policies work and contribute to HEI.

To address the highlighted gaps, this study examined the role of new internal quality assurance implementation, i.e., the Kaizen method, on HEI quality performance. It also examined the role of IT development as a moderator. By so doing, this study presents empirical evidence to related literature that discusses HEI quality issues, especially on how Indonesian HEIs executed their internal quality assurance amendment to enhance Indonesian HEI quality. Specifically, the current study will address this issue by empirically answering whether progressive changes in governance policies at HEIs in Indonesia, particularly through strengthening the internal quality assurance implementation by adopting a new method which is then supported by IT development, would offer any value in improving HEI quality.

## LITERATURE REVIEW

### *Internal Quality Assurance of HEI*

The issue of quality assurance is a subject of management accounting. Specifically, in the accounting department curriculum in some countries, including Indonesia, the quality issue is a concern and a subject of the management control system. For example, a Kaizen concept is a

[2] Press Release Number: 24/SP/HM/BKKP/III/2018; source: https://ristekdikti.go.id/siaran-pers/teknologi-informasi-penunjang-pelayanan-pendidikan-tinggi-3/

subject of learning in management accounting to maintain quality and reduce costs. Chartered Global Management Accounting (CGMA) defined the Kaizen as a customer-driven improvement philosophy which aims to strive a culture of continuous quality, cost, and delivery improvement across the value chain (CGMA, 2021). The Indonesian government officially adopts the Kaizen method to guide HEI in implementing internal quality assurance. The main aim of internal quality assurance implementation is to make sure that HEIs are able to manage and improve their quality continuously through systematic control toward teaching, learning, research, service community, service, governance/leadership, management, planning, internal and external HEI relationship, and other some HEI performance indicators (Cao & Li, 2014; Santos & Dias, 2017; Woodhouse, 1999).

***Internal Quality Assurance in Indonesian HEI***

According to the Indonesian regulation of 2016 related to internal quality assurance regulation for HEI, it is instructed that the internal quality assurance implementation in HEI must go through a cycle that is Setting of standards, Implementation of standard, Evaluation of standards implementation, Control of standards implementation, and Improvement of standards (SIECI). The SIECI cycle adopts the Kaizen method is depicted in Figure 1. In detail, SIECI activities are as follows:

i. **Setting of standards:** adopting national higher education standards set by the Ministry of Education and Culture and formulating own additional standards by HEI. The activities also involve the preparation of quality standard documents, SOPs, and key performance indicator targets.
ii. **Implementation of standard:** fulfillment of all standards (national higher education standards set by the Ministry of Education and Culture, and formulation of own additional standards by HEI);
iii. **Evaluation of standards implementation:** comparing the outputs of standard compliance activities with all standards set by HEI. It is carried out by conducting an internal audit;
iv. **Control of standards implementation:** an analysis of the causes of standards that are not achieved for corrective action. The analysis results are conveyed in the management meeting.
v. **Improvement of standards:** standards improvement activities to be higher than the currently used standards (adopted national higher education standards set by the Ministry of Education and Culture, and formulation own additional standards by HEI). This activity involves internal and external stakeholders (academic community) (employer, accreditation assessors, an auditor from the public accounting firm, etc.).

Although many studies on internal quality assurance have been undertaken by many researchers and continue getting attention, some remain. It is noted that most of the previous studies about internal quality assurance focused on a conceptual framework and design (Santos & Dias, 2017; Weusthof, 1995), history and evolution of internal quality assurance (Brennan & Shah, 2000; Zawada, 2019), and stakeholders' concern on internal quality assurance (Elassy, 2013; Mourad, 2017). However, Pratasavitskaya and Stensaker (2010) argue that the study about quality assurance approaches (accreditation, assessment, or audit) addressing issues at the institutional level was less common. On the other hand, how internal quality assurance as a policy to enhance HEI quality performance is still explored insufficiently.

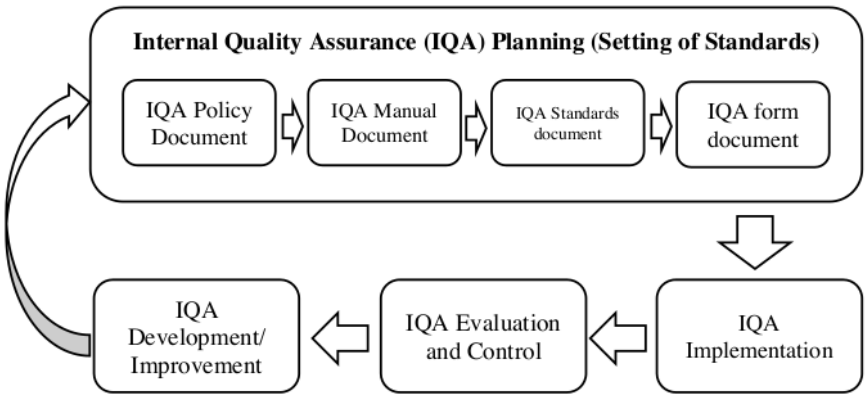


*Figure 1.* Kaizen method for HEI Internal Quality Assurance
Source: The Indonesian Internal Quality Assurance Guidance for HEI (2018, p. 31)

***Information Technology (IT) for Internal Quality Assurance of HEI***

In this study, the IT-IQA term is used, which refers to an intelligent information system to ensure quality in HEI developed by Elhoseny et al. (2017). Simply, it refers to the IT development to support internal quality assurance system implementation within HEI, which aims to help the internal quality assurance unit apply quality standards and ensure that they are maintained and enhanced (Elhoseny et al., 2017). Dealing with the context of this study, the IT-IQA design developed by Elhoseny et al. (2017) was not fully adopted. Still, it adapted to some conditions applied in the research location, Indonesia.

According to Elhoseny et al. (2017), IT-IQA should be created in accordance with HEI's internal quality assurance procedure. There are two main elements of the IT-IQA, the "effectiveness of the educational process" is the first. In order to maintain the quality of higher education, this component consists of seven core activities: (1) students and alumni; (2) academic standards; (3) educational programs/courses; (4) teaching and learning and physical facilities, such as buildings and computer resources; (5) staff development; (6) scientific research and scientific activities, such as organizing scientific conferences; and (7) graduate studies. These seven basic activities serve as a "protective belt" for students' general growth and experience, which is essential to the quality of HEI (Elhoseny et al., 2017). "Institutional capability" is the second element. Seven additional activities are included in this component: (1) strategic planning; (2) organizational structures; (3) leadership and governance; (4) credibility and ethics; (5) the administrative system (AS); (6) financial and material resources; and (7) community involvement and environmental development (Elhoseny et al., 2017). Each criterion in the framework has numerous indicators and calls for implementing one or more systems (Elhoseny et al., 2017). These systems, which are integrated into IT-IQA, each carry out a particular function in the quality system. Currently, empirical research on the IT-IQA deployment is still hard to find. A study by Elhoseny et al. (2017) is an initiative that formulates how IT is implemented to support IQA at HEI. However, they did not empirically examine the concept they proposed.

***Internal Quality Assurance and HEI Quality Performance***

Internal quality assurance has a significant role in overseeing, ensuring, and controlling the activities carried out by HEI following the quality standards and indicators (Martin, 2018; Mourad, 2017; Santos & Dias, 2017). Welsh and Dey (2002) revealed that internal quality assurance covers various quality aspects of the HEI, namely external accountability, academic programs, improvement of academic performance, outcomes assessment, and academic program databases. Therefore, it is expected that the HEIs could improve their quality performance by implementing internal quality assurance. However, an internal quality assurance implementation might enhance HEI quality performance if these two policies are implemented effectively (Akbar et al., 2012; Sofyani et al., 2018). This situation is in line with the RBV theory claim that internal quality assurance can be seen as a combination of human and organizational resources (Ali et al., 2015). Thus, to achieve a competitive advantage, these two resources should fulfill four criteria: valuable, rare, difficult to imitate, and no equivalent substitutes (Barney, 1991).

The RBV four criteria could be manifested as 'effectiveness' internal quality assurance implementation. The effectiveness of internal quality assurance indicates that they are valuable resources. On the other hand, although generally developed from the same concept and guidance as mandatory, internal quality assurance implementation is developed to fit HEI's specific characteristics and needs and therefore tends to be unique and exclusive. Thus, it triggers the differences in design, structure, and procedures from one HEI to another as a consequence of contingent factors (Jokipii, 2010). Consequently, it makes how to achieve effective internal quality assurance implementation on one HEI might difficult to imitate by another HEI. As such, pure imitation of internal quality assurance policies from other HEIs might not necessarily provide significant added value if the imitation process does not address the contingent factors that apply to the imitator HEIs (Lee & Zhou, 2012). Moreover, these two policies are not provided in the market since they should be developed by HEI independently. Thus, this policy implementation effectiveness is rare and difficult to substitute. Saying that it is logical to expect that effective internal quality assurance implementation would positively affect the HEI quality performance. Developing that, the hypothesis is formulated as follows:

**$H_1$:** Internal quality assurance implementation is positively associated with HEI quality performance.

***Information Technology Development and Performance***

Haris et al. (2017) argue that IT could effectively support the internal quality assurance unit in collecting, processing, presenting, and monitoring various data related to the quality management process and performance achievement of HEIs. Additionally, Elhoseny et al. (2017) argue that IT support in internal quality assurance implementation can promote good monitoring and accurate decision-making primarily related to quality standards fulfillment and performance indicators achievement. Drawing from the preceding arguments, IT development could enhance HEI's quality performance. Several studies have found that IT implementation can improve organizational performance (Chae et al., 2018; Queiroz et al., 2018; Tahar et al., 2022). Based on the preceding discussions, the hypothesis is formulated as follows:

**$H_2$**: IT-IQA implementation is positively associated with HEI quality performance.

***Information Technology as Moderator***

Although various studies have demonstrated the role of IT on organizational performance, some have also found divergent results (see: Liang et al., 2011; Wu et al., 2015). A faulty paradigm that sees IT as a non-strategic tool that supports sound governance practices in businesses results in a less ideal IT role in the performance improvement (Ali et al., 2012). To achieve the opposite condition, i.e., IT can support performance, IT needs to be incorporated into the organization's strategic plans. Positioning IT as an organizational strategy means that IT must be synchronized with other procedures, including internal quality assurance. If these resources, IT and internal quality assurance, are managed in harmony and with good synchronization, they will be more effective in encouraging the organization to attain its competitive advantage. This circumstance is consistent with what Resource Orchestration theory predicts.

According to Zhou et al. (2017), combining resource management with contemporary IT may enable businesses to more successfully find and gather special resources, enhance their capabilities, and generate value through ongoing resource reconfiguration. Low-tech businesses are therefore more likely to improve organizational performance and gain a competitive edge over rivals if they work to incorporate current IT in their resource orchestration process. The relationship between enterprise risk management and competitive advantage was found to be moderated by IT strategy and IT structure, according to Saeidi et al. (2019). Finally, Tetteh et al. (2020) discovered that IT moderates the association between the adoption of internal controls and firm performance. As a result of the conversation that has already taken place, the final hypothesis is as follows:

**$H_3$**: IT-IQA implementation moderates the relationship between internal quality assurance and HEI quality performance.

Based on the theoretical framework and hypotheses produced, the conceptual framework of this study is created, as illustrated in Figure 2.

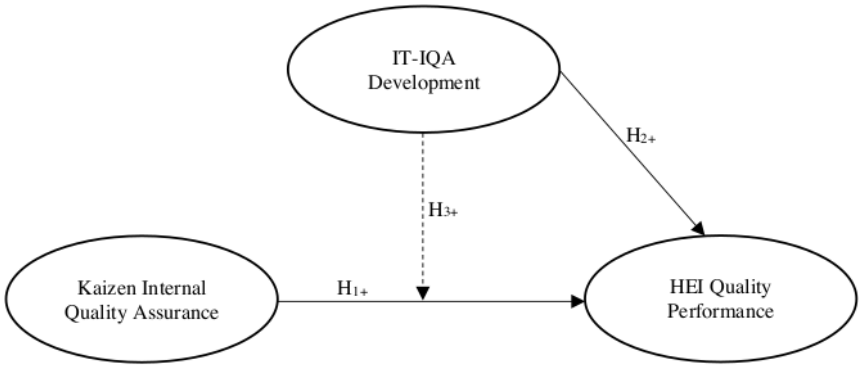


*Figure 2*. Conceptual Framework

## RESEARCH METHOD

The population of this study included all HEIs in Indonesia. Purposive sampling was used to choose the samples, and the following criteria were determined: The HEIs have developed IT to support internal quality assurance implementation. Besides, the samples were also chosen using

the cluster sampling technique by considering HEIs' locations, i.e., all 34 Indonesian Provinces. By so doing, this study can give to provide strong external validity result (Sekaran & Bougie, 2019). Judgment sampling was used to pick the respondents. The respondents ought to be in the best possible position to give the necessary details (Sekaran & Bougie, 2019). Specifically, the respondents were HEI's internal quality assurance unit management members. As this study used non-probability sampling method, power analysis is advised to determine the sample size (Memon et al., 2020). Therefore, this study's minimum sample size should be 77 HEIs. The distribution of the questionnaire's results are shown in Table 2. A minimum sample size was satisfied because 206 responses could be gathered and used for data analysis.

Table 2
*Questionnaire Distribution Result*

| **Information** | **Responses** | |
|---|---|---|
| | **Frequency** | **%** |
| Sent | 628 | 100.00 |
| Received | 233 | 37.10 |
| Un-appropriate respondent | 25 | 3.98 |
| Extreme answer | 1 | 0.16 |
| **Usable questionnaire** | **206** | **32.80** |

The study by Elhoseny et al. (2017) for IT-IQA, which examined relevant rules, served as the basis for the questionnaire employed in this study. Then, the Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia No. 62 of 2016 on Quality Assurance System for HEI and the internal quality assurance guidance book of 2018 were used as the primary reference when developing the internal quality assurance measurements. However, several relevant studies related to internal quality assurance, such as Martin (2018), Santos and Dias (2017), Mourad (2017), and Cheng (2003), were referred to confirm the compatibility of the measures. Internal quality assurance was measured using three dimensions: internal quality assurance mechanisms, integration, and scope. Additionally, a 2019 Indonesian HEI certification assessment tool was used to evaluate HEI quality performance. Due to the study context in Indonesia, it was implemented.

Additionally, all variables in the questionnaire were scaled using a Likert of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree. Following Lewis et al. (2005), Prior to being applied in a field, the questionnaire was sent to 13 experts for validation. They come from the domains of internal audit, quality control, and accounting information systems in the public sector. Following the results of the expert consultation, improvements were made to the questionnaire's instructions, word choice, grammatical errors, and scale.

Furthermore, to test the hypotheses, the variant-based Partial Least Square-Structural Equation Modelling (PLS-SEM) method was used. The non-parametric structure of the Likert scale and the size of the potential multicollinearity components are two reasons to employ PLS. PLS has also been widely employed in field research projects on information systems and accounting (Urbach & Ahlemann, 2010). Additionally, PLS is appropriate for this research since it imposes few data assumptions, necessitates a small sample size, and uses hypotheses with modest theoretical underpinnings (Chin et al., 2003). Since the internal quality assurance construct was formed by three dimensions with formative type, higher-order construct analysis was performed in this study.

(Becker et al., 2012). Specifically, a two-stage approach was adopted to test the moderating hypothesis, considering it is suitable for a model which includes formative constructs (Memon et al., 2019).

## RESULTS AND DISCUSSIONS

Table 3 presents information on research respondents; where most of them are Head/Director of IQA units.

Table 3
*Respondents Information*

| No | Position | n | % |
|---|---|---|---|
| 1 | Head/Director of IQA unit | 127 | 61.65 |
| 2 | Management member of IQA unit | 38 | 18.45 |
| 3 | Head of section unit of IQA unit | 12 | 5.83 |
| 4 | Secretary of IQA unit | 21 | 10.19 |
| 5 | Coordinator of internal auditor of IQA unit | 7 | 3.40 |
| 6 | Deputy head of IQA unit | 1 | 0.49 |
| | **Total** | **206** | **100.00** |

Table 4 presents the demographics of the sample and respondents. Out of a total of 34 provinces in Indonesia, only three provinces have no representative sample, namely North Kalimantan, Bangka Belitung Archipelago, and West Papua. Thus, the results of this study have sufficient external validity to cover Indonesia. However, some caution is needed in reading the research result as the ideal proportion of samples per province is uneven.

Table 4
*Demographic of Samples and Respondents*

| NO | DEMOGRAPHICS BY | | n | % |
|---|---|---|---|---|
| 1 | Type of HEI | University | 140 | 67.96 |
| | | Institute | 19 | 9.22 |
| | | Academy | 3 | 1.46 |
| | | Specialized School | 30 | 14.56 |
| | | Polytechnic | 14 | 6.80 |
| | **Total** | | **206** | |
| 2 | Public vs Private | Public | 65 | 31.55 |
| | | Private | 141 | 68.45 |
| | **Total** | | **206** | |
| 3 | Accreditation Predicate | A | 49 | 23.79 |
| | | B | 120 | 58.25 |
| | | C | 36 | 17.48 |
| | | Not Accredited Yet | 1 | 0.49 |
| | **Total** | | **206** | |
| 4 | Accredited by International Body | Yes | 42 | 20.39 |
| | | Not yet | 164 | 79.61 |
| | **Total** | | **206** | |
| 5 | Province | Aceh | 13 | 6.31 |
| | | North Sumatra | 6 | 2.91 |
| | | West Sumatra | 3 | 1.46 |

| | | | | |
|---|---|---|---|---|
| | | Riau | 5 | 2.43 |
| | | Riau Archipelago | 2 | 0.97 |
| | | Jambi | 3 | 1.46 |
| | | Bengkulu | 4 | 1.94 |
| | | South Sumatra | 5 | 2.43 |
| | | Bangka Belitung Archipelago | 0 | 0.00 |
| | | Lampung | 4 | 1.94 |
| | | Banten | 6 | 2.91 |
| | | West Java | 19 | 9.22 |
| | | DKI Jakarta | 12 | 5.83 |
| | | Central Java | 29 | 14.08 |
| | | Special Region of Yogyakarta | 13 | 6.31 |
| | | East Java | 31 | 15.05 |
| | | Bali | 6 | 2.91 |
| | | West Nusa Tenggara | 5 | 2.43 |
| | | East Nusa Tenggara | 2 | 0.97 |
| | | West Kalimantan | 1 | 0.49 |
| | | South Kalimantan | 8 | 3.88 |
| | | Central Kalimantan | 3 | 1.46 |
| | | East Kalimantan | 5 | 2.43 |
| | | North Kalimantan | 0 | 0.00 |
| | | Gorontalo | 2 | 0.97 |
| | | West Sulawesi | 1 | 0.49 |
| | | South Sulawesi | 6 | 2.91 |
| | | Central Sulawesi | 1 | 0.49 |
| | | Southeast Sulawesi | 3 | 1.46 |
| | | North Sulawesi | 1 | 0.49 |
| | | Maluku | 2 | 0.97 |
| | | North Maluku | 2 | 0.97 |
| | | West Papua | 0 | 0.00 |
| | | Papua | 3 | 1.46 |
| | **Total** | | **206** | |
| 6 | Respondent's education level | Bachelor | 4 | 1.94 |
| | | Master | 127 | 61.65 |
| | | Doctoral | 75 | 36.41 |
| | **Total** | | **206** | |
| 7 | Time of Working Experience of Respondent | < 5 years | 176 | 85.44 |
| | | 5 to 10 years | 25 | 12.14 |
| | | 10 to 15 years | 3 | 1.46 |
| | | 15 to 20 years | 2 | 0.97 |
| | | > 20 years | 0 | 0.00 |
| | **Total** | | **206** | **100** |

***Common Method Variance (CMV) Analysis***

The survey research data were self-reported. Therefore, CMV was a possibility (Podsakoff et al., 2003). The literature offers numerous options for resolving this issue. One of the methods frequently used to uncover this issue is the Harman single-factor test (Tehseen et al., 2017).

Evidence method bias arises when a single factor emerges from the factor analysis or when one general factor accounts for the majority (more than 50%) of the covariance between the measures (Podsakoff et al., 2003). According to analysis results, the first factor only explains 29.57% of the total variance or less than 50%. This finding demonstrates that common method bias insignificantly affects the study's findings.

Table 5 presents descriptive statistics of research variables in which internal quality assurance is represented by three dimensions: internal quality assurance mechanism, integration, and scope. In general, the implementation of internal quality assurance with the Kaizen method at HEIs in Indonesia has been running at a high level. However, the development of IT-IQA is still at a the level of moderate. The HEI quality performance is also generally at a moderate level. This implies that improvement efforts still need to be made.

Table 5
*Descriptive Statistics*

| Criteria | IQA Mechanism | IQA Integration | IQA Scope | IT-IQA | Quality Performance |
|---|---|---|---|---|---|
| Min | 2.05 | 2.00 | 1.82 | 1.72 | 1.03 |
| Max | 5.00 | 5.00 | 5.00 | 5.00 | 4.93 |
| Mean | 4.20 | 4.35 | 4.06 | 3.89 | 3.30 |
| SD | 0.54 | 0.58 | 0.64 | 0.75 | 0.67 |

Furthermore, this study examines the relationship between variables by conducting a structural model assessment. Before that, the measurement model assessment becomes a prerequisite to ensure the validity and reliability of the constructs within the model. It should be noted that the internal quality assurance and IT-IQA constructs were built with a formative type, while the HEI quality performance construct is reflective. Therefore, testing the validity and reliability of these different constructs also refers to different criteria. The formative constructs were analyzed by assessing indicators contributions (validity) of the constructs and the collinearity issue. The values of outer weight, loading, and with their significance, and VIF values were the concern. On the one hand, for the HEI quality construct that used reflective measures, the convergent validity, discriminant validity, and reliability tests were referred to in this construct (Hair et al., 2021).

***Measurement Model Assessment***

In the first test, it was found that many indicators had poor loading and VIF scores, so following the advice of Hair et al. (2021), they must be eliminated. In the second test, after dropping the poor indicators, satisfactory results were found on the results of the validity and reliability tests. Table 6 shows discriminant validity results for the HEI quality variable (reflective). The AVE root shows a higher score than its correlations with other constructs. This shows the establishment of discriminant validity (Fornell & Larcker, 1981). Meanwhile, the 'FC' code indicates that the intended construct uses a formative type, so the discriminant validity test is not applicable (Hair et al., 2021).

Table 6
*Discriminant Validity*

| Construct | IQA Integration | IQA Mechanism | IQA Scope | IT-QA | QUAL |
|---|---|---|---|---|---|
| IQA Integration | FC | | | | |
| IQA Mechanism | 0.788 | FC | | | |
| IQA Scope | 0.732 | 0.723 | FC | | |
| IT-IQA | 0.707 | 0.699 | 0.735 | FC | |
| QUAL | 0.538 | 0.583 | 0.592 | 0.678 | 0.707 |

Furthermore, Table 7 presents the results of the Convergent Validity and Reliability test of the HEI Quality construct. The results show that all indicators have a loading score higher than 0.5. Then, the fulfillment of convergent validity of the HEI quality is also indicated by the AVE score of 0.500. For reliability test results, Cronbach's Alpha and Composite Reliability values are the references (Chin et al., 2003). The test results indicated a score exceeding the rule of thumbs, 0.6 and 0.7, respectively (Chin, 2010; Hair et al., 2021). This result indicates that the requirement of reflective construct reliability (HEI quality) has also been met.

Table 7
*The Results of the Convergent Validity and Reliability Test of the HEI Quality Construct*

| Indicator | Item | Loading |
|---|---|---|
| QUAL3 | The quantity of study programs/departments accredited by the International Accreditation Board and acknowledged by the government of Indonesia | 0.672 |
| QUAL4 | Accreditation predicate of study program given by Ministry of Education and Culture | 0.671 |
| QUAL5 | Lecturer Recognition at both International and National Levels | 0.715 |
| QUAL6 | The selection of new students | 0.745 |
| QUAL7 | International students | 0.668 |
| QUAL12 | The impact of the community service program executed | 0.743 |
| QUAL13 | Income performance | 0.771 |
| QUAL14 | Income other than tuition fees | 0.703 |
| QUAL24 | The graduates are employed by multinational corporations or international organizations | 0.697 |
| QUAL26 | Number of patents or simple patents produced | 0.673 |
| QUAL28 | Number of appropriate technologies, products, artwork, social engineering produced | 0.708 |
| **Cronbach's Alpha** | | 0.900 |
| **Composite Reliability** | | 0.916 |
| **AVE** | | 0.500 |

Furthermore, Tables 8 and 9 present the results of the first-order (IT-IQA) and second-order (IQA) formative construct validity tests, respectively. In Table 7, the test results indicate that even though some indicators have insignificant outer weights, all their loading scores are significant, so they can still be concluded as valid (Hair et al., 2021).

*Table 8*
Formative Construct Validity (First Order)

| | Outer-weight | P value | Loading | P value | VIF |
|---|---|---|---|---|---|
| IT-IQA 1 -> IT-IQA | 0.108 | 0.052 | 0.525 | 0.000 | 1.898 |
| IT-IQA 11 -> IT-IQA | 0.079 | 0.094 | 0.463 | 0.000 | 1.608 |
| IT-IQA 2 -> IT-IQA | 0.143 | **0.025** | 0.557 | 0.000 | 2.195 |
| IT-IQA 3 -> IT-IQA | 0.342 | 0.000 | 0.628 | 0.000 | 2.003 |
| IT-IQA6 -> IT-IQA | 0.055 | 0.193 | 0.459 | 0.000 | 2.131 |
| IT-IQA7 -> IT-IQA | 0.146 | **0.032** | 0.515 | 0.000 | 2.084 |

The same thing applies to the results of the second-order IQA construct validity test in Table 8. Though one lower-order construct has insignificant outer-weight (IQA Integration), all their loading scores are significant. As such, it can still be concluded as valid (Hair et al., 2021). In addition, the VIF scores are less than 3.3 (Tables 8 and 9), indicating an insignificant autocorrelation issue. Also, a low VIF score indicates data independent of the CMV issue (Kock, 2015).

Table 9
*Formative Construct Validity (Second Order)*

| | Outer-Weight | P Values | Loading | P Values | VIF |
|---|---|---|---|---|---|
| IQA Integration -> IQA | 0.220 | 0.060 | 0.880 | **0.000** | 3.074 |
| IQA Mechanism -> IQA | 0.363 | **0.002** | 0.905 | **0.000** | 2.991 |
| IQA Scope -> IQA | 0.511 | **0.000** | 0.935 | **0.000** | 2.450 |

Because the validity and reliability tests have been fulfilled, hypothesis testing using the structural model assessment can be carried out.

***Structural Model Assessment***

Table 10 presents the Structural Model Assessment. The results of this study indicate that internal quality assurance and IT-IQA development are positively associated with HEI quality performance. Furthermore, the relationship between internal quality assurance and HEI quality performance is still significant even though IT-IQA development is a significant moderator. Thus, it can be concluded that the nature of the moderation effect is quasi.

*Table 10*
Summary of Structural Model Testing Results

| **Constructs' Relationship** | **Model 1 (Without Moderation)** | | | **Model 2 (With Moderation)** | | |
|---|---|---|---|---|---|---|
| | ***β*** | **SD** | ***t*** | ***β*** | **SD** | ***t*** |
| IQA → Quality ($H_1$) | 0.251* | 0.087 | 2.891 | 0.304* | 0.086 | 3.517 |
| IT → IQA (Not hypothesized) | 0.787* | 0.029 | 26.730 | 0.787* | 0.032 | 24.742 |
| IT → Quality ($H_2$) | 0.481* | 0.089 | 5.386 | 0.479* | 0.085 | 5.646 |
| Moderating Effect of IT ($H_3$) | | | | 0.066* | 0.037 | 1.802 |
| $R^2$ | 0.479 | | | 0.484 | | |
| $f^2$ | | | | 0.015 | | |

*$P<0.01$*

In addition, the results show that the adjusted $R^2$ value ranges from 0.479 to 4.84, which according to Chin (1998), is at a moderate level, meaning that the proposed model is quite good in explaining the relationship among variables. Additionally, it was found that the moderated model had a higher adjusted $R^2$ value indicating superior results (Memon et al., 2019). In other words, although the nature of the moderation is quasi, a model with this moderation is recommended to be used as a basis for practical implications.

***Discussions***

The results show that implementing internal quality assurance with the Kaizen method positively correlates with HEI quality performance. Moreover, the relationship is strengthened by the development of IT-IQA. These results affirm several research findings that IT has a reinforcing role in the contribution of control policies to organizational performance. Wales et al. (2013) discovered that the optimal value of entrepreneurial orientation for boosting business performance occurs at significantly greater levels in the presence of high levels of firm resource orchestration capabilities, such as IT competence, than when these capabilities are deficient. According to Liu et al. (2016), implementing the right IT expertise to match a company's supply chain integration (SCI) results in improved business performance. They discovered, in particular, that the "moderation" approach of fit suggests that IT competency could strengthen the relationship between SCI and operational and financial performance. In addition, Saeidi et al. (2019) revealed that IT strategy and structure significantly impacted competitive advantage and had a moderating impact on the relationship between enterprise risk management and competitive advantage. The final finding by Tetteh et al. (2020) concluded that IT moderates the association between IC and company performance. However, compared to the other internal control dimensions, the interaction impact was more significant for the control environment and control actions.

Furthermore, although not hypothesized, IT-IQA development is also positively associated with effective internal quality assurance implementation. These results confirm Elhoseny et al.'s (2017) idea that IT development can help with IQA implementation and provide precise decision-making to meet quality standards and performance indicators quickly and efficiently.

Based on the current study findings, it can be suggested that developing IQA by adopting the Kaizen concept benefits quality performance improvement. Furthermore, IT development should also be a serious concern for HEI management because of its positive role in improving HEI's quality performance. However, it is important to note that IT development also does not always bring added value if it is not accompanied by effective IT governance (Sengik et al., 2022; Sofyani et al., 2022). Therefore, good IT governance needs to be considered as it is a source of IT policy orchestration that aligns with the control policies that apply within the organization. Theoretically, this study provides an operational model description of how RBV and RO theories are operationalized in the context of the HEI sector. So far, many academics have claimed that RBV and RO theories seem tautological and too normative as theories. Meanwhile, how these are implemented in practice is less highlighted. This study empirically answers the criticism that the resource orchestration model can be realized by an interaction between IQA and IT directed at pursuing the main goal of HEI, namely quality performance.

## CONCLUSION

This study examined the role of new (Kaizen) internal quality assurance implementation on HEI quality performance with IT-IQA development as moderator. The questionnaire survey results captured final data from 191 Indonesian HEIs, which can then be analyzed using PLS-SEM. The results of hypotheses testing indicated that the development of IT-IQA strengthened the positive relationship between Kaizen internal quality assurance and HEI quality performance. However, the moderating role of IT-IQA was found to be quasi in nature. Further, although not hypothesized, IT-IQA development was also positively associated with HEI quality performance. From the results obtained, this study suggests that the implementation of internal quality assurance should be run effectively considering its benefit toward HEI quality performance enhancement. Moreover, the development of IT-IQA continues to be carried out by HEI and should be well orchestrated to promote its optimal contribution. To achieve this, IT development should not only be seen as a tool but also as a strategic policy of HEI. Therefore, the involvement of the IT team in the strategic planning of HEI is also a key requirement. Theoretically, this study confirms the RBV and Resource Orchestration theories, where the organization's arrangement and integration of interrelated internal resources are crucial in achieving HEI's competitive advantage. Both theories are often studied in the context of companies. Meanwhile, these theories are rarely discussed in the HEIs sector, where competition is also tight due to the ranking and accreditation phenomenon impact.

This study has several limitations. First, although the sample comes from 32 of the total 34 provinces in Indonesia, the sample proportion of each province is unequal. Therefore, the generalization of the results of this study needs to be done with caution. Thus, similar research can be carried out in specific areas or provinces to confirm and complement the result of this study. Second, this study did not include a cross-validation test using secondary data because the data required was private. In survey research, cross-validation is necessary to strengthen the research results. To cover this weakness, at least the subsequent study can be carried out with a qualitative approach to confirm the results of this study in detail. Third, this study did not divide the sample into certain categorizations such as based on size, accreditation status, and so on. This can be a gap for further research to be addressed. Seeing the crucial role of internal quality assurance using the Kaizen method in promoting HEI quality performance, further studies are recommended to examine the factors that trigger the successful implementation of the policy in question. This is important, considering that changes in policies related to governance within an organization only sometimes run smoothly, which in turn, does not necessarily bring added value to the organization.

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