

The Role of IT-Based Quality Assurance Systems in Higher Education: A Global Perspective

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Abstract

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This study aims to analyze the concept of quality assurance systems in higher education, explore the implementation of technology-based quality assurance systems in universities across various countries, and understand the role of information technology in strengthening these quality assurance systems. This review also aims to identify the various types of quality assurance present in higher education institutions, as well as the technologies or applications used to support these systems. The method employed is qualitative with a literature study approach, involving the collection and analysis of data from various written sources, including books and scholarly articles. The results indicate that quality assurance systems in higher education represent a systematic and continuous approach that includes the establishment, implementation, evaluation, control, and improvement of quality standards. Information technology plays a crucial role in enhancing efficiency, transparency, and accountability in the quality assurance process, as well as supporting faster and more effective accreditation evaluations. Although the implementation of technology-based systems offers numerous advantages, such as improved graduate quality and easier access to information, challenges such as infrastructure limitations, the need for skilled human resources, and data protection must still be addressed. Therefore, higher education institutions need to adapt to technological advancements and formulate appropriate strategies to optimize the implementation of technology-based quality assurance systems, in order to enhance the overall quality of higher education and meet the expectations of all stakeholders.

Keywords: quality, higher education, information technology

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INTRODUCTION

In the era of globalization and digitalization, higher education faces increasingly complex demands to ensure the quality of academic services that can compete globally. Higher education plays a vital role in producing competent human resources capable of competing in the global era. Higher education institutions not only function as providers of a workforce with skills and competencies aligned with market needs, but also as producers of leaders and thinkers who contribute to national development. The quality of higher education becomes a key determinant in shaping a generation ready to face global challenges, especially amidst rapid technological development and changing societal needs (Mustofa et al., 2024).

Quality is a crucial element in various contexts, including education, as it reflects excellence and distinguishes a product or service from others. In education, improving quality is essential to create an optimal learning process

capable of facing global challenges. According to Fadhli (2020), quality in educational institutions can be measured through eight main indicators, including support from various stakeholders, availability of resources, and attention to a relevant and challenging curriculum.

Quality management in education aims to ensure continuous quality improvement by focusing on the needs of both internal (students, lecturers, staff) and external (parents, society) customers (Rizal et al., 2020). One approach commonly used is the educational quality assurance system, which leverages information technology to improve the efficiency and effectiveness of evaluation processes and quality enhancement (Nurul Mutiah, 2020). Quality assurance in higher education not only involves setting strict educational standards but also ensuring compliance with those standards through the use of technology for real-time data collection, analysis, and improvement (Vettori et al., n.d.). IT-based technology in quality assurance in various countries, including Indonesia, has proven to enhance transparency, accountability, and overall educational quality (Meisuri et al., 2024).

However, one of the main challenges faced by higher education institutions is ensuring that educational services not only meet societal needs but also comply with international standards. In this context, IT-based quality assurance systems have emerged as an innovative solution. By leveraging IT, universities can improve efficiency, accuracy, and transparency in managing educational quality. These systems support data-driven decision-making and strengthen the global competitiveness of higher education institutions.

Although many institutions have adopted technology in quality management, gaps between policy and implementation remain a significant challenge. In some countries, IT systems are often used solely as administrative tools without integration with data analytics for strategic decision-making. As a result, their impact on improving academic quality and stakeholder satisfaction remains suboptimal (Nurlaila Nurlaila et al., 2024).

From a global perspective, these systems also serve as a critical tool for supporting international accreditation and enhancing the rankings of higher education institutions. The integration of IT-based quality assurance systems allows institutions to meet global standards more efficiently while offering flexibility to adapt to local needs (Siagian, 2024).

The purpose of this study is to analyze the concept of quality assurance systems in higher education, explore the implementation of IT-based quality assurance systems in higher education institutions across various countries, and understand the role of information technology in strengthening quality assurance systems. Additionally, this study aims to identify various types of quality assurance present in higher education institutions, as well as the technologies or applications used to support these systems.

Through a deeper understanding of the benefits and challenges of using information technology in quality assurance systems, it is hoped that higher education can implement the most effective and relevant approaches to improve the quality of education globally, both in developed and developing countries.

RESEARCH METHOD

This research uses a qualitative method with a literature review approach, aimed at analyzing the concept of IT-based quality assurance systems in higher education institutions in various countries and the role of information technology in improving educational quality, considering the benefits and challenges. The qualitative method with a literature review approach is a research technique focused on gathering and analyzing data from various written sources to delve into a specific concept, theory, or phenomenon (Nurjanah & Mukarromah, 2021; Lubis & Ritonga, 2023)

Data is obtained through a literature review, including books, scientific articles, and other relevant sources related to higher education quality assurance systems. The researcher gathers information regarding the application, benefits, and drawbacks of IT-based quality assurance systems in higher education institutions (Lubis, 2023). The analysis process involves reducing the data and then organizing the data obtained from the literature to understand the IT-based quality assurance systems in higher education institutions in different countries.

The researcher also evaluates the relevance and application of each approach within the context of different higher education institutions. Using thematic analysis, this study will identify the factors influencing the decision-making process in choosing IT-based quality assurance systems in higher education institutions across various countries, based on findings from the reviewed literature.

RESULTS AND DISCUSSION

The Concept of Quality Assurance Systems in Higher Education

Quality is a key aspect that needs serious attention as it reflects the excellence of a product or service compared to others. In the context of education, quality becomes a very important element to develop in order to create an optimal learning experience. Improving quality is not only the responsibility of goods providers but also service providers, including education. Quality is at the top of organizational agendas, and its improvement is considered the most important task for every institution. However, the concept of quality is often considered complex because it is difficult to define clearly and measure precisely. This difference in views shows that the concept of quality has a subjective nature that can vary depending on the context.

According to Sallis in Fadhli (Fadhli, 2020), there are eight main indicators that reflect the quality of an educational institution. These indicators include: 1) high moral values or character, 2) satisfactory exam results, 3) support from parents, the business world, and the local community, 4) availability of adequate resources, 5) implementation of the latest technology, 6) strong leadership with a clear vision, 7) attention and concern for students, and a balanced, relevant, and challenging curriculum.

Quality management in education aims to continuously improve quality by focusing on the needs of both internal and external customers. One form of quality management that is often implemented is the educational quality

assurance system. According to Wicaksono in (Rizal et al., 2020), this system functions to maximize the management procedures of evaluation instruments so that these instruments can be adjusted and improved during each evaluation period. Additionally, this system optimizes analysis procedures, making the evaluation process more efficient and eliminating the need for human analysts, as seen in manual evaluations. Through this system, educational institutions can ensure that evaluation instruments are always relevant and effective, while also improving the teaching and learning process continuously.

Higher Education Quality Assurance is a systemic activity aimed at improving the quality of higher education in a planned and sustainable manner. Quality assurance in higher education is carried out through the establishment, implementation, evaluation, control, and enhancement of Higher Education Standards (SPT) (Tinggi, 2023). Quality assurance is the process of setting and fulfilling quality standards in management consistently and continuously so that consumers, producers, and other stakeholders can experience satisfaction. Thus, quality assurance in higher education is a process of setting and meeting quality standards in higher education management consistently and sustainably so that stakeholders can achieve satisfaction.

Quality assurance in higher education means that the responsibility for the quality of higher education lies entirely in the hands of the respective universities. There are two main activities in higher education quality assurance: establishing and fulfilling higher education quality management standards. The quality of higher education must be planned, achieved, maintained, and improved continuously, and the quality of graduates must meet the expectations of all stakeholders (Meisuri et al., 2024).

An Information Technology (IT)-based Quality Assurance System is an approach that utilizes information technology to ensure and improve quality within an organization, especially in the context of education or other institutions. This system includes the use of software, digital systems, and other technological platforms to design, implement, and monitor established quality standards (Nurul Mutiah, 2020). The IT-based quality assurance system in higher education aims to utilize technology to ensure that education, teaching, research, and administrative services meet the quality standards and continue to improve.

Educational technology refers to a systematic approach to designing, implementing, and evaluating all teaching and learning activities. This approach considers both technical and human resources, as well as the interaction between them, with the aim of producing quality education (Lestari, 2018). The types of quality management theories relevant and applicable to this research include:

First, Total Quality Management (TQM), which focuses on continuous quality improvement in all aspects of an organization. In higher education, TQM involves all parties (lecturers, staff, students) in efforts to achieve the established quality standards. The use of IT in higher education supports TQM principles by providing tools for ongoing monitoring, data analysis, and process improvement.

In TQM, the customer is the focal point. Internal customers, such as students and teachers, and external customers, such as parents, society, and the business world, are the primary focus to ensure that the educational services

provided not only meet their needs but also exceed their expectations. Continuous improvement processes ensure that organizational performance remains relevant and responsive to external changes. The implementation of TQM in education, as explained by Arcaro, is based on five main pillars. These pillars include focusing on users, total involvement of all members of the organization, measuring outcomes and processes, commitment to change, and continuous improvement. These pillars allow educational institutions to dynamically adapt to the needs of customers and environmental changes, thus providing holistic and high-quality educational services. Therefore, quality management in education is not only focused on academic outcomes but also involves organizational culture, leadership, and integrated service quality (Sri Purnomo & Titik Haryati, 2023).

Second, quality-based curriculum in education is an approach designed to ensure that the applied curriculum meets high standards in teaching and learning. This curriculum focuses not only on delivering subject matter but also on developing skills relevant to students. Through a quality-based curriculum, students are encouraged to think critically, creatively, and solve problems in real-world contexts.

Learning content in this curriculum involves not only theoretical knowledge but also practical skills necessary in the workplace and daily life. Teaching methods often include problem-based projects, group discussions, and the use of learning technologies that allow students to access broader information and resources. Moreover, the quality-based curriculum also takes into account individual students' needs, learning styles, and personal development, ensuring that each student can reach their full potential.

Third, educational risk management is an approach used to identify, evaluate, and manage potential risks that could affect the quality of education within an institution. Risks in the educational context can vary, from changes in curriculum that affect the teaching-learning process, the implementation of new technologies that do not match the institution's infrastructure, financial issues such as inadequate funding, to challenges in human resources, such as shortages of qualified teachers or unplanned staff turnover. Educational risk management aims to minimize the impact of these risks through careful planning, risk mitigation, and ongoing monitoring. This approach involves steps such as formulating emergency plans, monitoring regulatory and policy developments, and developing effective communication skills to address crises (Tanjung et al., 2022).

Fourth, ****Quality Assurance (QA)**** refers to activities related to monitoring, evaluation, or review of quality. The goal of quality assurance is to build trust by ensuring the fulfillment of minimum standards or requirements in the input, process, and outcome components, in accordance with stakeholders' expectations. In education, quality assurance focuses on managing all educational activities and resources to achieve customer satisfaction (Ummah, 2019).

Implementation of IT-based Quality Assurance Systems in Various Countries

The implementation of IT-based quality assurance systems in higher education is part of efforts to ensure that education quality standards are maintained and continuously improved. In various countries, technology is used to accelerate, simplify, and enhance the efficiency of quality assurance processes,

from data collection, monitoring, evaluation, to continuous improvement. Although the implementation of technology varies in each country, the basic principles of using technology for quality assurance in higher education generally share common goals of increasing transparency, accountability, and efficiency in managing educational quality.

The implementation of IT-based quality assurance systems in higher education has proven to have a positive impact on improving education quality in various countries. Technology allows for more efficient, transparent, and integrated management and monitoring of education quality, supporting continuous improvement through real-time data collection and analysis. In developed countries like the UK, Germany, and the Netherlands, as well as in developing countries like Indonesia and India, the use of technology in educational quality assurance is becoming more widespread and in-depth. Although challenges related to infrastructure and human resource skills exist in some countries, the benefits gained from using IT far outweigh these challenges, such as increased operational efficiency, transparency in evaluation processes, and ease in conducting accreditation and monitoring of education quality.

Through IT-based systems, universities can perform faster and more accurate evaluations, analyses, and continuous quality improvements, ultimately producing graduates who are more competent and ready to face global challenges. Despite some barriers, such as the need for adequate infrastructure and the enhancement of management staff skills, the implementation of IT-based quality assurance systems remains a strategic step in the global effort to improve higher education quality.

For example, in the UK, IT-based quality assurance systems are widely used for accreditation and evaluation of academic programs. Higher education institutions use platforms like the QAA (Quality Assurance Agency for Higher Education) that provide guidelines and tools to digitally assess and evaluate the quality of education (Vettori et al., n.d.).

In Indonesia, the use of platforms or applications like the Internal Quality Assurance System (SPMI) enhances the efficiency and accuracy of internal quality assurance (SPMI) and internal audits (AMI). This enables higher education institutions to be more adaptive to regulatory changes and industry demands. This will increase their ability to meet established quality standards while strengthening their position both nationally and internationally. The use of the right technology can improve student satisfaction and the satisfaction of other stakeholders by making educational processes more transparent, efficient, and of high quality. Thus, higher education institutions can build a better reputation and attract more high-quality prospective students.

Various Types of Quality Assurance in Higher Education Institutions

According to Article 53 of the Higher Education Law (UU Dikti), the Quality Assurance System in Higher Education (SPM Dikti) includes the Internal Quality Assurance System (SPMI) designed independently by the higher education institutions, and the External Quality Assurance System (SPME) through accreditation. The Ministry of Education, Culture, Research, and Technology Regulation No. 53 of 2023 states that SPMI is a structured system aimed at ensuring and improving the quality of higher education. Higher

education institutions have the autonomy to design their own SPMI according to their unique characteristics, such as history, core values, number of study programs, and resources. This emphasizes that the SPMI of one institution may not necessarily be applicable to another. Every SPMI must cover five main steps as per Article 52, Paragraph (2) of the Higher Education Law: Determination, Implementation, Evaluation, Control, and Improvement (PPEPP). These steps form the core of SPMI implementation (Aswin Bacin, 2017).

Information technology plays a significant role in supporting the implementation of SPMI. In 2021, the Ministry of Education and Culture launched an SPMI Reporting application to help higher education institutions prepare reports, upload SPMI documents, and evaluate their implementation. This application is integrated with PD Dikti, allowing access through a dedicated SPMI account. The Higher Education Dashboard in the application presents institutional data, including profiles, study programs, faculty members, students, graduates, and accreditation information. This dashboard is continuously developed to monitor the effectiveness of SPMI implementation and assist the Directorate General of Higher Education, Research, and Technology in designing more targeted guidance programs. Higher education institutions are expected to regularly update their reports to support the achievement of optimal higher education quality (MOECRT, 2024).

Information Technology or Applications in Quality Assurance Systems in Higher Education

Higher education institutions need to adapt to the rapid development of technology and utilize various applications and digital platforms to improve the quality of education, teaching, and services to students. This technology involves the use of integrated academic information systems, internal quality management, accreditation applications, and online learning platforms. By leveraging this technology, institutions can enhance the learning process, improve administrative efficiency, simplify access to information, and support the development of students' competencies more flexibly and effectively.

First, SIAKAD 4.0 is an academic information system specifically designed to support administrative management in higher education institutions. This system provides efficient, secure, and integrated educational services. SIAKAD 4.0 features integrated online payment systems, continuous development, and support services to ensure successful implementation. It is also integrated with Neo Feeder PDDikti, facilitating accurate and fast reporting, offering support services, and providing affordable pricing with comprehensive features that cover the basic needs of higher education institutions.

Second, the Internal Quality Assurance System (SPMI) is aimed at managing data and activities related to Internal Quality Audits (AMI). SPMI ensures that all aspects of education, from the learning process, administrative management, to student services, meet established quality standards. This system plays a key role in maintaining and improving education quality through ongoing evaluation and internal improvement efforts within the institution.

Third, the Accreditation Application helps manage the supporting data required to prepare accreditation forms for study programs or higher education institutions. The accreditation forms contain comprehensive

information regarding the quality and performance of the study programs or institutions, which are necessary for evaluation and assessment by accreditation bodies.

Fourth, Civitas PMB Online is an online student admission application that facilitates automatic and real-time registration processes. This application enhances the reputation of the higher education institution by providing essential information for prospective students. Civitas PMB Online simplifies the registration process for both the PMB team and applicants, streamlining the payment system and attracting more prospective students to apply.

Fifth, Civitas LMS (Learning Management System) is a platform used to deliver various learning materials online. This platform facilitates the monitoring of learning activities, whether online, offline, or hybrid, and supports faculty members in delivering materials and assignments in a user-friendly interface. Civitas LMS provides an informative dashboard that updates learning activities, enhances the flexibility of learning, and supports more effective communication between lecturers and students.

Sixth, Open FEEDER is a data import application that simplifies the process for university operators to quickly and easily input data into the Neo Feeder system. This application provides academic consulting services and further development opportunities, and can be used for free. Open FEEDER streamlines data entry through Excel file uploads, ensuring smooth reporting and supporting the data needs of the PDDikti Feeder.

Seventh, Civitas E-Library is a practical and reliable library software. This application enables higher education institutions to manage various aspects of library operations, such as collection management, book borrowing, returns, guest records, and integration with SIAKAD 4.0. Civitas E-Library provides fast and accurate collection searches, supports barcode usage, and enables real-time monitoring of book availability and location, making information access easier and more effective for students (Neliwati, Surya Bakti, 2024).

The Role of Information Technology (IT) in Quality Assurance Systems

The role of information technology (IT) in quality assurance systems in higher education is critical and significant. IT helps improve efficiency, transparency, and accountability in the management of education quality. It provides ways to collect and analyze real-time data from various sources, such as exam results, curriculum evaluations, and faculty assessments. With better analysis, higher education institutions can gain a deeper understanding of the performance of study programs, faculty members, and the alignment of curricula with industry demands.

First, IT facilitates real-time data collection from various sources, including exam results, curriculum evaluations, and faculty assessments. This data is analyzed comprehensively to provide better insight into the performance of study programs, faculty, and the alignment of curricula with industry needs.

Second, IT enables higher education institutions to conduct structured evaluations of education quality. Digital platforms make it easier to prepare accurate and detailed reports on curriculum achievements, student

learning outcomes, and teaching effectiveness. These reports can be accessed by various stakeholders, facilitating transparency and accountability in the institution's adherence to quality standards.

Third, IT enhances transparency in quality assurance processes. Students, staff, faculty, and other stakeholders can access information related to quality assessments, educational standards, and campus policies openly. This strengthens the accountability of higher education institutions in meeting the established quality standards.

Fourth, IT enables more efficient management of administrative tasks related to quality assurance, such as student registration, tuition payments, and accreditation data processing. These systems automate various administrative processes, reducing the administrative burden on staff and speeding up administrative tasks, which often become bottlenecks in quality management.

Fifth, IT supports the development of student competencies by providing flexible access to a wide range of learning materials, such as lecture notes, video lessons, and practice tests. This technology allows for more personalized and adaptive learning, tailored to student needs, and supports the development of skills and competencies according to expected standards.

Sixth, IT makes it easier for institutions to track follow-up actions based on evaluation results and required improvements. Technology-based systems allow institutions to develop more focused improvement plans and monitor their implementation regularly. These systems also collect feedback from students, faculty, and alumni, serving as a foundation for continuous quality improvement (Suhada, 2019).

Advantages and Challenges of Using Information Technology (IT) for Quality Assurance Systems in Education

The use of IT in educational quality assurance systems offers many benefits, but it also faces several challenges that need to be addressed.

First, the advantages of using IT are evident in the increased efficiency and operational accuracy. Technology allows higher education institutions to collect, monitor, and analyze data in real time. This makes the evaluation and quality assurance process faster and more precise, reducing human errors and accelerating decision-making. Administrative processes such as student data management, reporting, and evaluations can also be automated. This reduces manual workloads and allows available resources to be allocated to more strategic tasks. IT facilitates easier access to relevant information for students, faculty, and management, enabling everyone to quickly access academic, curriculum, and quality evaluation data (Wahid, 2022).

Second, IT improves the quality of learning. E-learning platforms allow for more interactive and engaging delivery of learning materials. Technology supports distance learning, providing students the opportunity to study without geographical limitations. With technology-based systems, the educational process becomes more transparent and accountable. Data and reports generated can be accessed by various parties, making academic and managerial processes more open, organized, and trustworthy. IT strengthens transparency in the quality assurance process, allowing all stakeholders, from students to accreditation bodies, to better monitor the quality of education (Mulyasa, 2015).

Third, the use of IT in quality assurance systems enables easier and more open access to data and reports on educational quality. All stakeholders — students, faculty, university leadership, and accreditation bodies — can access relevant information more quickly and transparently. This enhances accountability in the quality assurance process and makes the educational process more open and trustworthy.

Fourth, IT also facilitates more informed decision-making. With in-depth data analysis, higher education institutions can identify areas needing improvement more quickly and efficiently. This allows for more evidence-based quality improvement planning, rather than relying on assumptions or estimates. With integrated systems, institutions can plan improvements more systematically and data-driven.

Fifth, IT enables continuous quality monitoring. Technology-based systems can automatically identify gaps or issues that need immediate attention. This makes it easier for institutions to implement more consistent and systematic quality improvement processes. With an integrated system, oversight can be conducted in real-time, enabling higher education institutions to respond quickly to emerging issues (Lestari, 2018).

Sixth, IT facilitates cross-institutional collaboration, both domestically and internationally. Through interconnected networks, educational institutions can build stronger partnerships, opening up opportunities for knowledge exchange, joint research, and the development of broader educational programs. This collaboration also enriches the educational experience for students and faculty, enabling institutions to develop more innovative programs that meet global needs (Fitriyadi, 2020).

However, the use of IT in quality assurance also faces significant challenges.

First, limited technology infrastructure remains a major obstacle, particularly in higher education institutions in developing countries. Not all educational institutions have adequate technology infrastructure, such as access to hardware, software, or fast internet connections. This challenge hinders the effective implementation of IT systems and may limit the potential benefits of such technology.

Second, the need for skilled human resources is another challenge. Higher education institutions require trained professionals in information technology management and data analysis to operate IT systems effectively. A lack of skilled personnel in these areas can be a major obstacle in applying IT for quality assurance.

Third, the use of technology in quality assurance involves managing personal student data and other sensitive information, so strong data protection measures are crucial to prevent data breaches or misuse. This security challenge requires higher education institutions to continually update their data protection policies and systems to ensure the security and trustworthiness of the data (Lestari, 2018).

CONCLUSION

Based on the discussion above, it can be concluded that the quality assurance system in higher education is a systematic and continuous approach to

improving the quality of education through the establishment, implementation, evaluation, control, and enhancement of quality standards. In this context, information technology (IT) plays a vital role in supporting the quality assurance process by providing greater efficiency, transparency, and accountability.

The application of IT-based quality assurance systems in various countries shows that technology can accelerate and simplify evaluation, accreditation, and continuous improvement processes, ultimately contributing to the enhancement of graduates' quality, making them more competent and ready to face global challenges.

However, despite the numerous advantages, the use of IT in quality assurance systems also faces several challenges, such as limited infrastructure, the need for skilled human resources, and the necessity of robust data protection. Therefore, higher education institutions need to adapt to technological developments and develop appropriate strategies to overcome these challenges. By doing so, the implementation of effective IT-based quality assurance systems can be a strategic step in improving the overall quality of higher education and meeting the expectations of all stakeholders.

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