

Operation Risk In The Learning Process and Management Strategies

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ABSTRACT

Operational risk within educational learning processes constitutes a critical dimension that directly influences the continuity, efficiency, and overall quality of instructional activities. Emerging from both internal and external sources—including curricular inconsistencies, inadequacies in human resource competencies, administrative inefficiencies, infrastructural limitations, and technological disruptions—these risks pose substantial threats to the attainment of institutional educational objectives. Through a descriptive qualitative approach grounded in an extensive literature review, this article systematically examines the typology, causes, and implications of operational risks in educational settings. Furthermore, the study highlights the urgency of implementing a comprehensive and integrated risk management framework encompassing risk identification, assessment, mitigation, monitoring, and continuous improvement. The adoption of internationally recognized standards such as ISO 31000, Business Continuity Planning (BCP), and Disaster Recovery Planning (DRP) is underscored as essential in fostering institutional resilience. The findings affirm that effective operational risk management not only minimizes disruptions but also strengthens pedagogical quality, enhances institutional governance, and ensures sustainable educational performance amid evolving challenges.

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1. INTRODUCTION

The learning process is the main activity in education that aims to produce students who have the skills and are ready to face the challenges of the times. However, learning is not without operational risks that can disrupt its smooth running and effectiveness. Operational risks in the learning process include various disturbances that may arise from within the institution, such as administrative errors and unprepared educators, as well as external factors such as limited facilities and technological disruptions. If not handled properly, these risks can reduce the quality of learning and hinder the achievement of overall educational goals. Risk management in education is essential to build a learning environment that is safe, supportive, and adaptable to change, especially in today's digital age. Schools and educational institutions need to adopt a proactive approach that includes early risk identification, impact analysis, and the development and implementation of effective mitigation strategies. These strategies include improving teachers' readiness to use technology, developing curricula that meet industry needs, providing training to improve human resource capacity and involving various stakeholders such as students, parents, and the community (Khoiryah et al., 2024).

Operational risk in the learning process is one of the crucial aspects that can affect the quality and effectiveness of education. This risk involves various potential disruptions or constraints that arise during the implementation of learning, both internal and external, which can hinder the achievement of educational goals. In the context of education, operational risk encompasses various forms of problems such as technical disruptions to digital learning devices, administrative errors, incompatibility of teaching methods with student needs, and behavioral risks that can reduce the comfort and safety of the learning environment. The importance of understanding operational risks in the learning process is based on the increasing complexity of learning dynamics, especially with the ever-expanding integration of digital technology. The use of electronic learning systems brings great benefits, but it also presents new challenges that must be managed properly to avoid disrupting the smoothness and quality of learning. Therefore, identifying, analyzing, and managing operational risks has become a strategic activity to minimize disruptions and ensure the continuity of effective and efficient learning processes.

The problem that arises in this context is how to identify the operational risks that most affect the learning process and determine appropriate and effective handling strategies. Without good risk management, the learning process can experience serious disruptions that impact students' learning outcomes. Therefore, the proposed problem-solving plan includes an in-depth analysis of existing risk types, the development of technology and human resource-based mitigation strategies, and the implementation of measurable preventive and corrective steps. Managing operational risks in learning requires a comprehensive and adaptive strategy, ranging from prevention and early detection to disaster recovery. This strategy must be designed based on a deep understanding of the sources of risk and their impact on the learning process. The purpose of this study is to examine the common types of operational risks that occur in the learning process and to develop effective handling strategies to improve the resilience and quality of the learning system. Thus, the results of this research are expected to serve as a reference for education practitioners and policymakers in optimizing the teaching and learning process in the digital era.

With planned risk management, educational institutions can not only minimize disruptions to learning, but also improve resource efficiency, maintain the psychological and physical safety of students, and enhance the reputation of educational institutions. The implementation of effective risk management also enables institutions to face future uncertainties and challenges more resiliently, so that learning objectives can be achieved optimally and sustainably (Samiyah & Jeprianto, 2024). The learning process, as the core of the education system, plays a crucial role in shaping the character, skills, and knowledge of students so that they are ready to compete in a dynamic global era. However, the complexity of this process poses various challenges and risks that need to be comprehensively identified. Operational risks in learning not only affect the quality of teaching but can also cause significant disruptions in achieving educational goals. Therefore, a deep understanding of the sources and consequences of operational risks is fundamental.

In addition to internal risks directly related to the readiness of educators and administrators, external factors such as limited facilities and infrastructure, inadequate technological infrastructure, and changes in education policy add another layer of complexity to the risks. The development of digital technology, while bringing convenience, also introduces new potential risks such as information system failures and a lack of digital literacy among teachers and students. This situation requires educational institutions to have a risk management system that is not only reactive but also proactive and adaptive. Effective risk management in the context of education can serve as a strategic tool to strengthen the institution's resilience to disruptions and uncertainties. These efforts are not only oriented towards controlling threats, but also towards strengthening internal capabilities through training, curriculum updates, and cross-stakeholder collaboration. With a systematic and sustainable approach, educational institutions are able to create a conducive, innovative learning environment that is responsive to the needs of students and the demands of the times. In depth the various operational risks that occur in the learning process and examine how risk management can be effectively applied so that the teaching and learning process is not disrupted and can run optimally. The findings from this study are expected to provide empirical contributions to policy-making and risk management practices in the educational environment, particularly in supporting the sustainability and quality of learning in the future.

Article Type

This manuscript is classified as a conceptual review article. The study emphasizes theoretical analysis and synthesis of existing research related to educational risk management in the digital era, complemented by limited field insights. No primary quantitative data collection or statistical testing was conducted. Instead, the article integrates findings from previous studies to develop a structured understanding of risk categories and mitigation strategies applicable to primary education settings.

2. METHOD, DATA, ANALYSIS

This study uses a descriptive qualitative research method that focuses on in-depth data collection and analysis to describe the phenomenon under study comprehensively and systematically. In the context of this study, the data collection technique used is a literature study, which is one of the methods often chosen in qualitative research to obtain a solid theoretical understanding as a basis for analysis. Sugiyono (2018) defines the qualitative descriptive method as the process of describing natural phenomena without seeking cause-and-effect relationships, with an emphasis on in-depth analysis thru interviews, observations, or documents to identify subjective patterns and meanings. Creswell (2014) adds that this approach focuses on a holistic understanding of phenomena thru qualitative data, making it suitable for exploratory studies that delve into natural experiences and contexts.

Koentjaraningrat defines qualitative research as a descriptive, verification, or grounded research design suitable for unstructured phenomena, where the researcher serves as the primary instrument for narrative analysis. Lexy J. Moleong (2005) describes it as an effort to understand phenomena holistically thru word descriptions in a natural context, using natural methods such as document studies. Nazir (1988) emphasized his goal of creating systematic, factual paintings about the current phenomena's facts, nature, and relationships. According to Sarwono (2006), a literature study is a research approach that examines and analyzes information from various written sources, such as reference books, journal articles, theses, previous research reports, and other relevant documents related to the research topic. This approach is also often referred to as library research or research library study, because data is collected indirectly through written materials without having to conduct observations or collect data directly in the field. The advantage of this method is that it is able to provide a broader and deeper conceptual overview supported by existing research findings, thereby enabling the construction of a strong theoretical framework and argumentation.

Furthermore, literature studies serve as a means of collecting existing and reliable secondary data, both in print and digital form. Moh. Nazir (2015) explains that literature studies are a data collection technique that involves reviewing books, scientific journals, notes, reports, and other documents directly related to the research problem. This approach allows researchers to identify the main theories, key concepts, and previous empirical findings that can be used to strengthen the analysis and discussion in the research. Suharsimi Arikunto (2002) also emphasizes that literature study is a data collection method conducted by searching for and examining information from various written sources such as books, magazines, newspapers, and other documents. The main purpose of this method is to form a strong theoretical foundation and provide context and an overview in understanding the phenomenon being studied. In addition, literature studies help place research within the corridor of existing scientific developments and avoid duplication of research.

In this study, the literature review process was conducted systematically through the stages of selecting relevant literature sources, evaluating data credibility, and synthesizing information to support the explanations and analysis in the article. Although this method has limitations, namely that it does not involve the collection of primary data directly from the research object, this approach is very effective in examining phenomena that require a deep understanding of theory and concepts, such as operational risk management in the learning process. This literature-based research also allows for the examination of various perspectives and previous research results, thereby producing comprehensive and in-depth analysis.

3. RESULT AND DISCUSSION

Result

The results of this study indicate that operational risks in the learning process are challenges that affect various important aspects of education. Unlike strategic risks, which tend to be long-term in nature, operational risks focus more on technical and procedural issues that arise on a daily basis, such as administrative errors, lack of educator preparation, limited facilities, and technological disruptions. These risks stem from internal and external factors that have the potential to hinder the smooth flow of knowledge and the achievement of student competencies.

Some of the main sources of operational risk include curricula that are not in line with the needs of the world of work, mismatched teacher competencies, and limitations in the physical and digital infrastructure that supports the learning process. In addition, risks also arise from inefficient education management and administration systems, which can cause schedule disruptions, data errors, and a decline in the quality of

academic management. This situation is exacerbated by challenges that arise in the digital age, where dependence on online learning technology presents additional risks such as system disruptions and data security. Research shows that the greatest risk stems from the curriculum, particularly its incompatibility with labor market demands and changes in learning dynamics. An unresponsive curriculum prevents students from achieving vocational competencies and reduces the relevance of the education provided. In addition, the quality of human resources is an important factor that determines the effectiveness of learning, where low educator competency and a lack of continuous professional development can exacerbate operational risks. Inadequate learning infrastructure, both physical and digital, also greatly impacts the smooth running of the learning process, especially during online and hybrid learning.

Planned and sustainable risk management has proven to be crucial in addressing these various risks. Effective risk management must include proactive risk identification, assessment, and mitigation to maintain the continuity and quality of learning. The implementation of international standards such as ISO 31000, Business Continuity Plans, and Disaster Recovery Plans is believed to strengthen the resilience of educational institutions in the face of operational disruptions. This not only reduces potential losses but also increases the resilience of institutions in ensuring that the teaching and learning processes run smoothly and optimally. The finding that curriculum mismatch with the needs of the world of work is a dominant risk provides important evidence that educational institutions must continue to dynamically evaluate and adjust their curricula. A stagnant curriculum will result in graduates being unprepared to face market demands, which ultimately weakens the relevance and competitiveness of education itself. This is in line with the need for a paradigm shift in education that prioritizes vocational skills and adaptation to the latest technology and industry trends. In addition, low teacher competence and limited supporting facilities emphasize the importance of continuous investment in the development of educator professionalism and infrastructure modernization. These conditions are crucial indicators that show that human and material factors cannot be separated in ensuring the smooth running of the learning process. Both must be managed in an integrated manner through continuous training, increased digital literacy, and improvements to physical and digital facilities.

The implementation of risk management oriented towards international standards such as ISO 31000 and business continuity planning mechanisms demonstrates a targeted strategic approach in anticipating and responding to operational disruptions. This shows that educational institutions are not merely learning institutions, but also organizations that must have resilience and flexibility in facing various risks, including the increasing risks of technology and data security in the digital age. Overall, the results of this study provide a comprehensive picture of how operational risk management should be an integral part of education management strategies. A collaborative and planned approach enables educational institutions to not only overcome current obstacles but also prepare for future challenges. Thus, the effectiveness and sustainability of the learning process can be ensured, in order to achieve optimal and globally competitive quality of education.

Discussion

A. Operational Risks in the Learning Process

Operational risks in the context of learning are an important dimension that impacts the sustainability and effectiveness of education at various institutional levels. Unlike strategic risks, which focus on achieving long-term vision and mission, operational risks highlight technical and procedural aspects that occur in daily learning activities. These risks include failures in processes, systems, human resources, and external events that can hinder knowledge transfer and the achievement of student competencies. Operational risks in the learning process refer to the possibility of losses or disruptions arising from failures or inefficiencies in the internal mechanisms of the education system. Tinangon & Purba (2024) emphasize the importance of routine risk assessment, prevention, training, and supervision in educational institutions to avoid and reduce losses. Based on Belluz's (2010) explanation, operational risk is a risk that arises from internal processes, human resources, systems, or external factors that can affect the achievement of overall educational goals. In the context of learning, this risk can arise from various aspects, such as teacher quality, student readiness, irrelevant curriculum, and an unsupportive learning environment (Ahmad et al., 2016).

Experts emphasize that operational risks arise from the complexity of educational institutions' activities, including internal risks such as curriculum mismatches with vocational needs and external risks such as infrastructure disruptions. Sopuntan (2014) classifies these risks based on their occurrence into internal (operational, human resources, losses) and external risks, which, if not managed, can halt educational programs. Meanwhile, a study at the STIA LAN Polytechnic in Bandung found that operational risks related to vocational curricula were the highest, followed by reputational risks such as accreditation, indicating the need for a broad risk perspective in transformational institutions. Operational risks in the learning process are disruptions that may arise due to various internal and external factors that can hinder the smooth running of

teaching and learning activities. According to Perajaka (2021), operational risks are losses that arise as a result of internal processes, human error, inadequate systems, or unexpected external events. In the context of education, these risks can arise from various aspects such as technical constraints, ineffective time management, human resource problems, and disruptions to school facilities and infrastructure.

Operational risks in the learning process are threats that arise from various internal and external factors that can hinder the effective and efficient achievement of educational goals. In the field of education, operational risks include various potential disruptions arising from technical aspects such as facility damage, information technology failures, limitations in educator competence, and suboptimal management and administration issues. In today's digital age, risks related to the use of learning technology have also increased, such as data security, system disruptions, and the digital divide among students (Samiyah, 2024). Research by Samiyah (2024) emphasizes that risk management in education must be carried out in a planned and sustainable manner to ensure an effective and sustainable learning process. This is in line with the findings of Radiana et al. (2022), who state that a comprehensive risk management approach includes proactive risk identification, analysis, and control to ensure a safe and conducive learning environment.

Risk identification and evaluation are very important initial steps in educational risk management, which involves a comprehensive assessment of the likelihood of risks occurring and their impact. Through this process, educational institutions can prioritize risks that need to be addressed immediately and formulate targeted mitigation strategies. For example, risks related to inadequate facilities, such as insufficient laboratories or unrepresentative classrooms, can be minimized through budget planning and routine maintenance (Purnama, 2025). In another study conducted by academics at the university, it was found that the implementation of teaching and learning planning procedures in accordance with the ISO 9001:2015 standard was able to ward off possible operational risks, including risks in online learning and learning material management. These structured and standardized procedures contribute to reducing disruptions and improving the quality of learning.

Risk analysis in the learning process at a school shows that risks can be divided into four main categories, namely risks originating from students, teachers, the curriculum, and the academic environment. The findings of this study reveal 29 major risks that have the potential to hinder the effectiveness of learning. The greatest source of risk comes from a curriculum that is not aligned with the needs of the world of work (link and match). Mitigation measures include curriculum adjustments and the implementation of work-based learning methods for students, as well as the implementation of internship programs for teachers as an effort to improve the competence of teaching staff (Suyitno, 2022). In the literature on educational risk management, operational risks are categorized as internal risks arising from the incompatibility or failure of academic processes, including competency-based curricula, teaching methods, assessment systems, and learning resource management. Recent research shows that operational risks in learning can arise in various forms, such as mismatches between the curriculum and industry needs, limitations in educators' pedagogical competencies, inefficient academic administration systems, and failures in digital learning technology infrastructure.

Operational risks in education are not only related to technical aspects of learning, but also reflect the readiness of the risk management system that handles these risks. Effective operational risk management is crucial for identifying, evaluating, and controlling risks that may arise so that they do not interfere with the learning process and the achievement of educational goals. Based on ISO 31000:2018, risk management is a structured process aimed at addressing uncertainty by identifying possible risks and taking appropriate mitigation measures (Syamsia, 2022). For example, operational risk management in an educational environment must consider elements such as the stability of information technology networks to support online learning, the readiness of human resources in utilizing technology, and the availability of adequate supporting facilities. Risks of technological failure, such as server disruptions or a lack of technical understanding, can hinder the learning process. Therefore, mitigation strategies may include technology training for teachers and students, regular IT infrastructure maintenance planning, and the development of backup systems to ensure the continuity of learning (Febra et al., 2024).

One important dimension of operational risk is curriculum risk, which includes the inability of educational institutions to design and implement curricula that are in line with scientific developments and labor market needs. Research conducted on higher education institutions shows that the highest risk based on risk value is operational risk related to competency-based vocational curricula. This indicates that the process of developing, revising, and implementing curricula requires special attention within the framework of educational risk management, especially when institutions undergo organizational transformation or policy changes. Operational risk also includes failures in the learning assessment and evaluation process, which can affect the validity and reliability of measuring student competency achievement. Assessment systems that are not standardized, objective, or in line with learning outcomes can produce graduates who do not meet the expected qualifications. In the context of competency-based learning, this risk becomes more

complex because it requires assessment instruments that are able to measure not only cognitive aspects, but also skills and attitudes comprehensively.

Other dimensions of operational risk include:

1. Human Resource Risks in Learning

Human resources, particularly educators and educational staff, are critical factors in the learning process that are vulnerable to various forms of operational risks. These risks include limitations in pedagogical competence, mismatches between educators' qualifications and the subjects they teach, low motivation and performance among educators, and high turnover rates among teaching staff. Research shows that human resource risks can have a direct impact on the quality of learning, as educators' competence is crucial to the effectiveness of knowledge transfer and the achievement of learning objectives. Furthermore, operational risks also include failures in the continuous professional development of educators, resulting in stagnant competencies and an inability to adapt to innovative learning methods and the latest educational technologies. Educational institutions that do not have structured training and competency development programs will face the risk of a gradual decline in the quality of learning.

2. Infrastructure and Learning System Risks

Operational risks also stem from limitations and failures in learning infrastructure, both physical and digital. Physical infrastructure includes classrooms, laboratories, libraries, and other learning support facilities, which, if inadequate or poorly maintained, can hinder the learning process. Meanwhile, digital infrastructure includes academic information systems, online learning platforms, and technological devices that are increasingly becoming essential in the era of digital learning. Failures in information technology systems in learning, such as server disruptions, loss of academic data, or insecurity of student and educator data, are forms of operational risk that can have a serious impact on the continuity of the learning process. In the context of online or hybrid learning, this risk is even greater due to the high dependence on the stability of technological infrastructure and cybersecurity.

3. Administrative and Learning Management Risks

Another dimension of operational risk is failure in administrative and learning management processes, which include class scheduling, course registration, academic data management, reporting, and accreditation. Irregularities in academic administration can cause disruptions to the learning process, such as schedule conflicts, unclear information, or data errors that affect student satisfaction and success. Administrative risk is also related to compliance with education regulations and standards set by the government or accreditation bodies. Non-compliance with National Education Standards (SNP) or other regulations can result in administrative sanctions, downgrading of accreditation, or even revocation of an educational institution's operating license. Therefore, operational risk management must include mechanisms for continuous monitoring and evaluation of compliance with applicable standards and regulations.

4. Time and Loss Risks in Learning

Operational risks also include time risks, which refer to delays or failure to achieve learning targets within the set timeframe. This can be caused by various factors, such as unexpected holidays, natural disasters, social unrest, or health crises like the COVID-19 pandemic, which forced drastic changes in learning modes. Delays in curriculum completion can impact students' readiness to face final evaluations or enter the next level of education. Additionally, there are risks of loss, which can include financial losses due to operational inefficiencies, reputational damage to the institution due to failures in learning management, and the loss of opportunities for students to reach their optimal potential. This risk of loss is often an accumulation of various operational risks that are not well managed, thus requiring a holistic and integrated risk management approach.

B. Operational Risk Management Strategies

Operational risk management in the context of learning requires a systematic, structured approach that focuses on prevention and mitigation of negative impacts that could hinder the achievement of educational goals. Operational risk management strategies focus not only on risk identification and analysis, but also on developing appropriate responses to each category of risk that has been identified, as well as implementing effective and sustainable control measures. Operational risk management strategies in education include a systematic approach to identifying, evaluating, and controlling daily threats such as administrative errors, facility limitations, and technological disruptions to ensure the smooth running of the learning process. This approach typically follows a standards-based risk management cycle such as ISO 31000, which involves periodic risk identification, impact analysis, and the development of proactive mitigation plans.

Effective operational risk management strategies in the learning process must involve cooperation between various stakeholders, such as teachers, students, parents, and school administrators. Clear communication and regular training on risk management are essential to raise awareness and promote a

collective response to potential risks. In addition, good risk communication also plays a role in conveying the mitigation measures being implemented so that all parties can support the implementation of this strategy (Samiyah, 2024). In practice, risk mitigation can take the form of strengthening human resource capacity by improving the competence of teachers and staff, developing reliable and secure technology systems, and adjusting the curriculum to be responsive to changes in the learning environment. Research also shows the importance of periodic evaluation and monitoring of the effectiveness of the risk management strategies implemented to ensure the sustainability of the learning process and the achievement of educational goals (Kurniawan, 2024). Thus, operational risks in the learning process are not only threats that need to be avoided, but also challenges that can be overcome through a systematic and collaborative risk management approach. Effective risk management will support the creation of a conducive learning environment, minimize disruptions, and improve the overall quality of education.

To manage operational risks, the recommended approach is to implement an integrated risk management framework that includes risk identification, measurement, evaluation, and mitigation. This strategy includes the implementation of Business Continuity Management (BCM), Business Continuity Plans (BCP), and Disaster Recovery Plans (DRP) that aim to ensure the continuity of the learning process in the event of a disruption. These activities are important in building the resilience of educational organizations and reducing the negative impact on the quality of learning. An effective operational risk management strategy in education must be based on a comprehensive and standardized risk management framework. The ISO 31000:2018 Risk Management Standard framework provides guidelines that can be adapted to the educational context, covering basic principles such as integration with organizational processes, a structured and comprehensive approach, adaptation based on institutional context, stakeholder engagement, responsiveness to change, use of the best available information, and consideration of human and cultural factors.

The application of the ISO 31000 framework in education encompasses three interrelated core elements. First, risk management principles that form the basis for effective risk management, including integration with the governance structure and business functions of educational institutions. Second, a framework that provides a structure and basis for supporting risk processes throughout the organization, including leadership commitment, integration into governance structures, establishment of roles and responsibilities, resource allocation, risk management policies, communication, and continuous evaluation and improvement. Third, an organized and repeatable risk management process for addressing risks, including communication and consultation, scope and context setting, risk identification, risk analysis, risk evaluation, risk treatment, and monitoring and review.

Experts emphasize four key strategies for managing operational risks:

1. Risk Avoidance: Avoid high-risk activities, such as implementing new technology without adequate training, to prevent disruptions to learning.
2. Risk Reduction: Reduce probability or impact through teacher training, digital infrastructure upgrades, and curriculum standardization to meet industry needs.
3. Risk Transfer: Transferring risk to a third party, for example through school facility insurance or outsourcing of education IT systems.
4. Risk Retention: Accepting low risk with reserve funds or contingency plans, such as business continuity planning for online network disruptions.

In practice, operational risk mitigation strategies in learning can be implemented through various concrete actions tailored to the type and level of risk, namely:

1. Curriculum risk, educational institutions can standardize their curricula by forming a special team tasked with developing guidelines for curriculum development and implementation in accordance with the conditions and needs of the institution. This process includes periodic reviews of the relevance of the curriculum to developments in science and the demands of the world of work, as well as adjustments to learning outcomes in line with national and international standards.
2. Human resource risks, mitigation strategies include capacity building through continuous training and professional development programs for educators and educational staff. These programs can take the form of modern pedagogy workshops, learning technology training, accreditation standard seminars, as well as lesson study and peer teaching activities to improve pedagogical competence. Institutions also need to develop a rigorous recruitment and selection system to ensure that educators' qualifications and competencies are appropriate for the subjects they will teach.
3. Administrative risks, mitigation strategies include digitizing academic information systems to reduce manual errors, standardizing operational procedures (SOPs) for each administrative process, and implementing a quality assurance system to ensure compliance with education regulations and standards. Institutions also need to develop internal audit mechanisms that are conducted periodically to detect.

The application of information and communication technology (ICT) is becoming an additional key strategy in managing operational risks in learning, especially to overcome disruptions to digital infrastructure and student data security. Educational institutions can integrate a redundant Learning Management System (LMS) with cloud backup to prevent downtime due to server failures, and implement cybersecurity protocols such as data encryption and two-factor authentication to protect student privacy from cyberattacks. This approach not only reduces the risk of losing administrative data but also ensures the continuity of online learning during pandemics or natural disasters thru a flexible hybrid platform.

Another complementary strategy is the development of a school safety culture thru routine emergency simulations and data-driven health protocols based on local epidemiological data. For example, the formation of rapid response teams for emergency evacuations or the prevention of infectious disease spread among students and teachers is supported by physical facility audits, such as inspections of building structures and classroom ventilation. This strategy is effective in addressing operational risks related to physical and mental health, thereby creating a safe learning environment and supporting the achievement of national education standards.

For sustainability, institutions need to implement data analytics-based real-time risk monitoring dashboards, enabling early detection of anomalies such as declining student participation or IT system overload. This process is complemented by a feedback loop from annual stakeholder surveys to revise mitigation strategies, ensuring adaptation to new risks such as curriculum regulation changes or budget fluctuations. This evaluative approach strengthens the overall resilience of educational organizations.

4. CONCLUSION

This study concludes that operational risks in the learning process are multidimensional threats originating from internal factors such as curriculum mismatch, limited teacher competence, administrative failures, and external factors such as limited infrastructure and technological disruptions, which significantly hamper the effectiveness and sustainability of education. The greatest risk was identified in curricula that are not responsive to the needs of the world of work, followed by issues of human resources and digital infrastructure, which require proactive management based on ISO 31000 for identification, analysis, mitigation, and continuous monitoring. The implementation of strategies such as risk avoidance, reduction, transfer, and containment, supported by Business Continuity Planning (BCP) and Disaster Recovery Planning (DRP), has been proven to strengthen the resilience of educational institutions, improve the quality of learning, resource efficiency, and adaptation to the digital era.

To minimize operational risks in the learning process, educational institutions are advised to establish integrated and sustainable risk management. Strengthening educator competencies, updating the curriculum to be relevant to the times, and improving physical and digital infrastructure need to be done consistently. Additionally, the digitalization of academic administration and good communication between teachers, students, and all stakeholders will help create a safer, more effective, and more adaptable learning process in the face of various operational challenges.

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