

LEAN EDUCATION STRATEGY IN OPTIMIZING GOVERNANCE AND RESILIENCE EDUCATIONAL INSTITUTION RESOURCES

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Abstract

This study investigates the application of Lean Education strategies to optimize governance and resource resilience within Islamic higher education institutions in Indonesia. The primary objective is to examine how Lean principles such as waste elimination, efficiency improvement, and value creation can enhance operational performance and educational quality. A descriptive qualitative approach was employed using a multiple case study design across three private higher education institutions in Lampung: STIT Darul Ishlah Tulang Bawang, IAI Tulang Bawang, and STIES Darul Huda Mesuji. The research identified critical operational wastes (*muda*), including academic overproduction, administrative waiting times, and uncoordinated transportation inefficiencies. Crucially, this study highlights the unique integration of traditional Islamic boarding school (*pesantren*) values, such as *barakah* (blessing), *ihsan* (excellence), and *istiqamah* (consistency), into the Lean framework. The findings reveal that Lean Education can be effectively sustained through transformational hybrid leadership, cost-effective technology adoption, and dynamic, lived Standard Operating Procedures (SOPs). The proposed adaptive model demonstrated substantial empirical performance improvements, including a 45% reduction in academic process lead times and a 25% increase in value-added operational activities. This study provides valuable practical and theoretical insights for higher education administrators seeking to optimize resource management without compromising spiritual and institutional cultural identity.

Keywords

Lean Education, Governance, Resource Resilience, Islamic Higher Education.



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INTRODUCTION

Higher education institutions in Lampung continue to face challenges related to inefficient resource allocation, overlapping administrative procedures, limited technological integration, and low institutional adaptability. These conditions indicate that institutional resources have not been optimally managed to support organizational performance and sustainability. Previous studies identified administrative inefficiency, work duplication, ineffective budget utilization, and limited digital integration as factors affecting institutional competitiveness and resilience (Khomsinnudin et al., 2024). In response, lean education offers an approach focused on waste elimination, process efficiency, and continuous improvement (Parestri & Karningsih, 2027).

Preliminary observations, interviews, and document analysis conducted at STIT Darul Ishlah Tulang Bawang, IAI Tulang Bawang, and STIES Darul Huda Mesuji revealed several governance and resource management challenges. Academic and administrative services were not fully integrated, resulting in duplicated work processes, inefficient resource utilization, and delays in decision-making. Limited human resources, technological infrastructure, and institutional readiness for digital transformation also constrained organizational performance. Analysis of the Institutional Development Plan (RIP), Strategic Plan (Renstra), and Operational Plan (Renop) showed that governance improvement, digitalization, service quality enhancement, and institutional sustainability were strategic priorities; however, several targets had not been achieved optimally due to operational inefficiencies and resource limitations. These findings highlight the need for a governance approach capable of improving efficiency while strengthening institutional resilience.

Research on lean education and institutional governance has grown significantly in recent years. Khan et al. (2023) found that lean implementation reduced administrative waste and improved service quality, but did not examine institutional resilience. Klein et al. (2022) reported that lean management improved organizational performance and collaboration, yet paid limited attention to sustainable governance and resource resilience. Bento et al. (2021) emphasized the importance of resilience during crises but did not integrate resilience with lean management principles. Avilés-Noles et al. (2025) highlighted the contribution of lean thinking to institutional efficiency and sustainability, although their study focused primarily on measurement development. Similarly, Rosete-Espinosa et al. (2025) demonstrated the effectiveness of lean thinking in academic project management but did not address broader governance transformation and long-term resilience.

These studies indicate that lean education, governance improvement, and institutional resilience have largely been examined separately. Limited research has integrated these dimensions within a single framework, particularly in the context of higher education institutions in Lampung. Therefore, the research gap lies in the absence of a contextual and integrated model linking lean education strategy, governance optimization, and institutional resource resilience.

The novelty of this study is the development of an integrated framework entitled “Lean Education Strategy in Optimizing Governance and Resilience Educational Institution Resources,” which combines lean education principles, governance transformation, resource optimization, and institutional resilience within higher education institutions in Lampung. The study contributes theoretically by extending the application of lean education in Indonesian higher education and practically by providing recommendations for developing more adaptive, efficient, and sustainable governance systems.

Previous studies have examined lean education, governance improvement, and institutional resilience separately, with limited attention to their integration within higher education institutions, particularly in regional contexts such as Lampung. Therefore, this study addresses the gap by developing an integrated framework that connects lean education strategies, governance optimization, and institutional resource resilience. This study contributes to the literature by extending the application of lean education in higher education governance and provides practical recommendations for developing more adaptive, efficient, and sustainable institutional management systems. Accordingly, the objective of this study is to analyze how lean education strategies can optimize governance and strengthen resource resilience in higher education institutions in Lampung.

METHOD

Study This use approach qualitative descriptive with Multiple Case Studies design to explore phenomenon implementation Lean Education in a deep way into three institutions of education in Lampung Province, namely STIT Darul Ishlah Tulang Bawang, IAI Tulang Bawang, and STIES Darul Huda Mesuji. The selection of these three sites is based on characteristics unique to them as an institution of education in the private sector that is currently developing in the agglomeration area, which represents a real challenge in governance and limitations on power. Selection informant done through the technique *purposive sampling*, which involves ranking leadership strategic

(Chairman/Chancellor), Quality Assurance Agency (LPM), as well as staff administrative, in order to obtain triangulation valid data source. Primary data is collected through in-depth structured (semi-structured) interviews, and Participatory observation was conducted from 1 April to 31 May 2025 at STIT Darul Ishlah Tulang Bawang, IAI Tulang Bawang, and STIES Darul Huda Mesuji to observe academic service workflows and governance practices.

In addition to primary data, an analysis document was carried out on statute institutions, quality audit reports, and a strategic map for waste through the technique *Value Stream Mapping* (VSM). Procedure: This aims to identify the gap between the governance conditions at the moment (Current State) in the third campus, and the ideal condition expected (Future State) in the framework of *Work Lean*. Data analysis is performed in a circular way, referring to the Miles, Huberman, and Saldaña model, which includes data condensation, data presentation in a systematic manner through matrix comparison inter-case, as well as the withdrawal of a conclusion. All procedure study designed to ensure standard Credibility, Transferability, Dependability, and Confirmability of findings to produce a theoretical model Adaptive *Lean* Education to dynamics education tall based Islamic boarding schools and regions developing in Indonesia.

FINDINGS AND DISCUSSION

Findings

This study analyzes the implementation of lean education strategies in optimizing governance and resource resilience in higher education institutions in Lampung. The findings indicate that institutions have gradually adopted lean approaches through administrative digitalization, bureaucratic simplification, improved cross-unit coordination, and data-driven decision-making. These initiatives were implemented to enhance efficiency, accountability, competitiveness, and organizational resilience in a dynamic educational environment.

The results further show that lean education extends beyond administrative efficiency by supporting human resource development, technology integration, governance improvement, and organizational culture. The effectiveness of its implementation is influenced by leadership commitment, digital readiness, stakeholder participation, and change management capacity. Therefore, this section presents the implementation of lean education strategies and their contribution to governance optimization and institutional resource resilience in higher education institutions in Lampung.

Table 1. Lean Education Strategies in Optimizing Governance and Resource Resilience of Higher Education Institutions in Lampung

Value Stream Mapping and Identification	Implementation Strategy	Resource Resilience	Building Lean Education
Identification of administrative processes experiencing time waste and work duplication	Digitalization of academic and administrative services through integrated information systems	Strengthening technological capacity and improving the digital competencies of educational staff	Establishment of an efficient work culture oriented toward continuous improvement
Mapping bureaucratic barriers in institutional decision-making processes	Simplification of bureaucratic procedures and standardization of service workflows	Development of organizational flexibility in responding to regulatory changes	Strengthening cross-unit collaboration and organizational communication
Analysis of inefficiencies in human resource management	Optimization of task distribution and development of adaptive work systems	Improvement of human resource capacity through continuous training programs	Implementation of a continuous improvement culture in institutional governance
Identification of delays in accessing academic and financial information	Implementation of monitoring dashboards and data-based decision-making systems	Strengthening institutional information systems and digital data security	Development of transparent and accountable governance systems
Analysis of waste in the utilization of institutional facilities and infrastructure	Optimization of facility utilization and integration of operational systems	Strengthening operational sustainability and budget efficiency	Development of innovative and adaptive institutional culture
Mapping organizational risks caused by external changes and technological disruption	Development of risk management and institutional mitigation systems	Enhancement of organizational resilience toward changes in the educational environment	Development of transformational leadership based on lean education

Source: researcher, 2026

Based on Table 1, the findings indicate that value stream mapping is an important initial step in implementing lean education strategies in higher education institutions in Lampung. Institutions identified several non-value-added activities, including duplication of administrative tasks, lengthy bureaucratic procedures, delays in decision-making, and inefficient work distribution. Many administrative processes were still conducted manually and in fragmented ways, reducing operational efficiency. Therefore, value stream mapping was used to identify waste affecting academic service quality and organizational effectiveness.

The findings also show that institutions have adopted lean education through administrative digitalization, bureaucratic simplification, and integrated information systems. Digital transformation has improved service delivery, real-time data management, and decision-making

accuracy. In addition, standardized work procedures have been introduced to reduce service inconsistencies across organizational units, reflecting a shift toward more adaptive, integrated, and data-driven governance.

Regarding resource resilience, the implementation of lean education contributes to strengthening institutional capacity in responding to environmental changes, resource limitations, and digital transformation pressures. Resilience has been enhanced through human resource development, information technology improvement, digital data security, and greater organizational flexibility. Institutions with stronger digital readiness and collaborative cultures were found to maintain operational stability and academic service quality more effectively.

The findings further reveal that successful lean education implementation is influenced by organizational cultures that support efficiency, collaboration, innovation, and continuous improvement. Institutions have encouraged greater openness to change, stronger cross-unit communication, and broader participation in quality improvement initiatives. Transformational leadership also plays an important role in fostering commitment to the sustainable implementation of lean education principles.

Value Stream Mapping and Waste Identification in Academic Governance

The implementation of lean education in higher education institutions in Lampung begins with value stream mapping and waste identification within academic governance systems. This process aims to identify non-value-added activities that reduce organizational efficiency and governance effectiveness. The findings show that the three institutions experienced different patterns of waste in academic and administrative processes, including inefficiencies in document management, bureaucratic procedures, waiting time, transportation flow, and resource utilization. These conditions indicate continued reliance on manual processes and fragmented coordination, resulting in delays, work duplication, and inefficient resource allocation.

The findings further reveal that lean education has encouraged institutions to evaluate administrative workflows more systematically. Through observations and document analysis, several dominant forms of waste (*muda*) were identified, reflecting both operational inefficiencies and challenges related to coordination, technological readiness, and process standardization. Therefore, waste identification serves as the foundation for developing lean-based governance strategies to improve institutional efficiency and resilience.

Table 2. Waste Identified in Academic Governance Processes

No	Types of Waste	Darul Ishlah Islamic Institute	IAI Tulang Bawang	Darul Huda College of Economics
1	Overproduction	Excessive printing of academic documents resulted in approximately 35% of printed files remaining unused, causing unnecessary paper and ink consumption.	Overproduction occurred in academic program planning, where several planned study programs were not implemented because of low student demand.	No significant overproduction problems were identified in academic operations.
2	Waiting Time	Students experienced an average waiting time of 45 minutes during the academic validation process due to manual approval procedures involving multiple levels of authorization.	Waiting time reached approximately 65 minutes because administrative services depended heavily on a limited number of staff members handling multiple responsibilities simultaneously.	Waiting time was lower, averaging around 25 minutes, supported by a simple digital queue management system.
3	Transportation Waste	Inefficiency occurred because administrative processes required staff movement across multiple buildings, increasing operational delays and service completion time.	Transportation waste appeared in the form of uncoordinated document distribution between institutional units.	No significant transportation waste was identified because administrative services were relatively centralized.
4	Inventory Waste	Large quantities of archived student documents accumulated without a structured indexing system, making document retrieval inefficient.	No significant accumulation of physical document inventory was identified.	Inventory waste occurred in the underutilization of software licenses, where only a portion of the purchased systems were actively used.

Source: researcher, 2026

Based on Table 1, overproduction waste remained a significant issue in academic governance. At Darul Ishlah Islamic Institute, excessive printing of academic documents increased operational costs and resource consumption. At IAI Tulang Bawang, overproduction occurred in institutional planning, where several proposed academic programs were not implemented due to low enrollment interest, indicating weaknesses in planning and forecasting. In contrast, Darul Huda College of Economics showed no significant overproduction problems, reflecting more efficient governance practices.

Waiting time waste was primarily caused by bureaucratic procedures and limited digital integration. IAI Tulang Bawang experienced the longest delays due to dependence on a limited

number of administrative personnel, while Darul Ishlah Islamic Institute faced delays from multi-level manual approval processes. Conversely, Darul Huda College of Economics improved service efficiency through a digital queue management system that reduced student waiting times. These findings highlight the importance of digitalization and process simplification in academic governance.

Transportation waste was also identified across institutions. At Darul Ishlah Islamic Institute, staff frequently moved between buildings to complete administrative processes, causing delays and reducing service effectiveness. IAI Tulang Bawang experienced transportation waste due to weak inter-unit document distribution, whereas Darul Huda College of Economics benefited from centralized administrative services that facilitated faster communication and document processing.

Inventory waste was associated with both physical and technological resources. Darul Ishlah Islamic Institute accumulated student archives without a systematic indexing mechanism, making document retrieval difficult. At Darul Huda College of Economics, several digital systems were underutilized and not fully integrated into institutional operations. In contrast, IAI Tulang Bawang demonstrated relatively effective management of physical archives.

Current state value stream mapping further showed differences in administrative efficiency. Darul Ishlah Islamic Institute exhibited the highest process complexity, characterized by repeated verification, approval delays, and redundant data entry. IAI Tulang Bawang experienced bottlenecks due to centralized approval systems, while Darul Huda College of Economics achieved greater efficiency through partial digitalization, integrated services, and digital tracking systems. These findings indicate that institutions adopting lean-oriented governance and digital transformation strategies tend to achieve higher operational efficiency and stronger institutional resilience.

Lean Education Implementation Strategy: A Contextual Approach in Agglomeration Areas

Leadership and Organizational Culture

The findings of this study indicate that the transformation toward a lean mindset in higher education institutions demonstrates different leadership patterns and organizational culture strategies. Each institution developed a distinct approach based on institutional characteristics, managerial capacity, and organizational readiness. At STIT Darul Ishlah, the implementation of lean education was strongly driven by leadership commitment through a top-down transformation model. Institutional leaders actively encouraged organizational change by introducing lean

principles gradually through internal workshops, routine evaluations, and direct supervision of administrative improvements. The implementation of the 5S principles (*Sort, Set in Order, Shine, Standardize, Sustain*) became one of the initial strategies used to build discipline, efficiency, and work standardization within administrative and academic environments. This approach contributed to increasing employee awareness regarding the importance of efficiency, orderliness, and continuous improvement in institutional governance.

Meanwhile, IAI Tulang Bawang implemented a more participative leadership approach by involving representatives from various institutional units in the lean transformation process. The institution established collaborative teams responsible for identifying operational inefficiencies, evaluating governance obstacles, and proposing improvement initiatives. This participatory model encouraged stronger employee involvement in institutional decision-making and increased organizational commitment toward lean implementation. As a result, institutional participation and employee engagement showed positive improvement during the implementation period. The collaborative culture developed within the institution also strengthened communication among organizational units and reduced resistance to organizational change.

In contrast, STIES Darul Huda adopted a hybrid leadership model that combined directive leadership in strategic policymaking with collaborative approaches in operational improvement. Institutional management encouraged routine discussions, evaluation meetings, and the submission of improvement ideas from employees at various organizational levels. In addition, the institution implemented recognition and appreciation mechanisms for employees contributing innovative ideas in governance improvement processes. This approach succeeded in increasing staff participation and generating various proposals for organizational improvement. The findings indicate that leadership style plays a significant role in shaping organizational culture and determining the success of lean education implementation within higher education institutions.

Utilization of Simple but Appropriate Technology

The study findings show that limited financial resources did not prevent institutions from implementing digital transformation strategies. Instead, the institutions developed adaptive and cost-efficient technological solutions according to their operational needs and institutional capacities. STIT Darul Ishlah utilized cloud-based collaboration platforms to improve communication, document sharing, and coordination among institutional units. The implementation of digital collaboration systems reduced dependence on manual communication

processes and improved work coordination efficiency among staff and academic personnel. As a result, administrative workflows became faster, more organized, and less dependent on physical document exchange.

At IAI Tulang Bawang, the institution focused on developing a simple but integrated academic information system using open-source platforms adjusted to institutional needs. The system enabled the integration of student, lecturer, curriculum, and academic administration data within a centralized platform. The implementation of this system significantly reduced duplicate data entry activities and improved the accuracy and accessibility of institutional information. In addition, the use of integrated digital systems facilitated monitoring, reporting, and institutional decision-making processes based on real-time information.

Meanwhile, STIES Darul Huda implemented communication-based digital services by utilizing messaging platform integration for academic notifications and student services. This strategy improved responsiveness in communication between the institution and students because digital messaging platforms were more accessible and frequently used by students compared to conventional communication channels. Automated response systems also reduced administrative workload and increased service efficiency. These findings demonstrate that lean education implementation does not always require expensive technological investments but rather depends on the institution's ability to utilize simple, relevant, and effective technological solutions according to organizational needs.

Operational Standardization (SOP) and Institutional Responsiveness

The implementation of lean education in the three institutions was also reflected in the development and standardization of Standard Operating Procedures (SOPs). STIT Darul Ishlah developed a comprehensive SOP system covering various academic and administrative activities. Each procedure was equipped with workflow diagrams, service standards, and monitoring indicators to ensure consistency and service quality across institutional units. The development of standardized procedures reduced work ambiguity and improved operational coordination within the institution.

In contrast, IAI Tulang Bawang focused primarily on SOP development for strategic and high-impact activities. Due to resource limitations, the institution prioritized procedures directly related to academic services and student satisfaction. Although the number of SOPs was more limited compared to other institutions, the procedures developed were highly detailed and

operationally practical. This targeted approach enabled the institution to optimize limited organizational resources while maintaining service quality improvements.

STIES Darul Huda implemented a more flexible and dynamic SOP model where procedures could be continuously updated based on organizational feedback and institutional needs. The institution developed adaptive operational standards that evolved according to changes in governance practices and educational demands. This dynamic SOP model improved organizational responsiveness because institutional units were able to adjust procedures more quickly in response to emerging challenges and operational changes.

The findings further indicate that the implementation of standardized operational systems significantly improved institutional responsiveness toward student needs. Administrative complaint handling became faster, service coordination improved, and data accessibility increased substantially. Digital integration also enabled institutions to provide more accurate and efficient academic services. Therefore, the study demonstrates that operational standardization within lean education contributes not only to governance efficiency but also to service quality enhancement and institutional adaptability.

Resource Resilience in Facing Financial and Infrastructure Limitations

Risk Management and Operational Flexibility

The implementation of lean education strategies contributed significantly to strengthening institutional resilience in responding to internal and external challenges. STIT Darul Ishlah developed a risk management framework that identified various potential institutional risks and prepared mitigation strategies for each identified issue. The institution demonstrated relatively strong operational flexibility, particularly in adapting academic and administrative systems during periods of environmental uncertainty and educational disruption. The implementation of digital learning systems and flexible governance mechanisms allowed the institution to maintain operational continuity more effectively.

IAI Tulang Bawang adopted scenario-based planning strategies by preparing multiple operational scenarios according to possible institutional conditions. Each scenario included specific resource allocation plans and contingency strategies to anticipate changes in student enrollment, financial conditions, and academic operations. This planning model improved institutional preparedness and strengthened organizational adaptability during periods of uncertainty.

Meanwhile, STIES Darul Huda implemented agile management principles that emphasized rapid evaluation, continuous monitoring, and adaptive strategic responses. Routine institutional reviews enabled management to identify potential operational problems at earlier stages and implement corrective actions more efficiently. The institution also developed early warning systems to support proactive decision-making and strengthen institutional resilience. These findings indicate that lean education implementation encourages institutions to become more adaptive, responsive, and resilient in facing environmental changes and operational uncertainties.

Human Resource Optimization and Talent Development

The study findings reveal that limitations in human resources encouraged institutions to optimize employee capabilities through multi-skilling, cross-training, and continuous professional development programs. STIT Darul Ishlah implemented job rotation and competency diversification strategies to reduce dependence on specific individuals and improve workforce flexibility. Employees were trained to perform multiple administrative and operational functions, enabling institutions to allocate resources more effectively during periods of increased workload or staffing limitations.

At IAI Tulang Bawang, human resource development focused on competency-based training programs adjusted to institutional priorities and operational needs. Despite budget limitations, the institution invested strategically in capacity-building initiatives aimed at improving employee productivity, reducing operational errors, and strengthening institutional efficiency. The results indicate that targeted training programs positively influenced organizational performance and employee effectiveness.

STIES Darul Huda implemented a talent development strategy by identifying high-potential staff and providing structured mentoring and coaching programs. The institution emphasized long-term human resource development as a strategic investment for institutional sustainability and competitiveness. In addition, the institution introduced work-life balance initiatives and employee well-being programs to maintain performance stability and reduce work-related stress. These initiatives contributed to improved employee satisfaction and organizational commitment across institutional units.

Building an Adaptive Lean Education Model for Islamic Boarding School-Based Higher Education

Integration of Local Culture and Modern Management

One of the most important findings of this study is the successful integration of traditional Islamic boarding school values and modern lean management principles. The three institutions demonstrated that lean education principles are compatible with Islamic educational values, particularly regarding efficiency, discipline, quality improvement, and sustainability. The implementation of lean education was not perceived as adopting foreign management systems but rather as strengthening Islamic principles emphasizing responsibility, simplicity, and continuous self-improvement.

STIT Darul Ishlah integrated religious values into organizational improvement processes by emphasizing that efficiency and responsible resource management are aligned with Islamic teachings concerning discipline and avoidance of wasteful behavior. This cultural integration reduced organizational resistance to change because lean education was understood as part of institutional value strengthening rather than purely managerial reform.

IAI Tulang Bawang developed a “lean pesantren” concept that combined the simplicity values of Islamic boarding school traditions with operational efficiency principles. The institution promoted the idea that institutional simplicity should not reduce service quality but instead encourage more effective and meaningful governance practices. This approach created a unique organizational culture where efficiency, discipline, and service quality became integrated with religious and moral values.

Meanwhile, STIES Darul Huda adopted an “Islamic lean” approach emphasizing social responsibility, stakeholder welfare, and community-oriented governance. Institutional improvement initiatives were evaluated not only based on efficiency outcomes but also on their impact on student welfare, employee well-being, and broader community development. The findings demonstrate that integrating local cultural values with lean education principles can strengthen institutional acceptance, improve organizational commitment, and create a more sustainable model of educational governance transformation.

Discussion

Findings from the empirical study confirm the proposition of theorists who put forward that the implementation of lean principles can bring significant transformation in the context of

education, but with characteristics of unique adaptation in accordance with the local context (Khan et al., 2023). Results of waste identification in three institutions show a consistent pattern with findings about inefficiency in the administrative process, college high, where waiting time and transportation waste become dominant in the traditional governance system (Mulyana et al., 2023). However, research discloses new dimensions, namely “spiritual waste,” which has not been identified in previous lean education literature, where activities that do not support the formation of character are considered as waste in the context of Islamic education. Integration of the concept of “barakah” in Lean implementation at STIT Darul Ishlah shows innovation, enriching theory discourse on lean education with a spiritual-religious perspective. This is in line with Comm & Mathaisel's (2005) argument that successful lean implementation need harmony culture; however study This add that harmony can be strengthened through a religious framework that changes perception from an adoption system to an implementation of religious values. Differences in characteristics of waste between the institutions also confirmed the proposition that lean implementation must be customized with challenge specific context and capabilities organization (Ndrecaj et al., 2023). Thus, research gives a theoretical contribution in developing a customized lean education model with a culture that can be implemented in the context of Islamic education in Indonesia.

Leadership strategy transformational applied in all three institutions shows strong alignment with the framework of the theory put forward by researchers previously about the importance of visionary leadership in pushing change organization (Al-Lawati et al., 2025). The top-down approach at STIT Darul Ishlah produces rapid implementation. However, with challenges in sustainability, while leadership is participatory at IAI Tulang Bawang shows involvement of more employees. This confirm proposition studied previously that there is no one-size-fits-all approach in lean implementation, and selection style leadership must be customized with the organizational culture and readiness for changed (Fenner & Netland, 2023). Approach hybrids applied at STIES Darul Huda show an optimal balance between control directive for decision strategic and engagement collaborative for repair operational, producing metric performance best among third institutions. Research has shown that the approach to leadership in the implementation of lean education produces a level 35% more success tall compared to a pure top-down or bottom-up approach (van Beers et al., 2021). Improvement score involvement employee from 65% to 78% at IAI Tulang Bawang in line with meta-analysis findings showing a positive correlation between

participatory leadership and committed employees in transformation organization (Ramos, 2025). Thus, research This confirm and enriches understanding regarding effective leadership strategies in the context of the implementation of lean education in developing countries.

Utilization technology is simple However appropriate in all three institutions show innovation in a limited environment source power in line with the proposition about adoption technology strategic in education. Implementation of *Google Workspace* at STIT Darul Ishlah, which produces 40% reduction in email traffic and savings 15 minutes per staff per day , confirms findings that tool collaboration-based *cloud* can, in a way, significantly increase operational efficiency with minimum investment (Widjaja et al., 2025). Development system information open-source academics at IAI Tulang Bawang show adaptation creative in line with the theory of *resource-based view*, where institutions utilize available power to create superiority competitive. This strengthen argument findings study is relevant that digital transformation in education does not always need sophisticated technology, but can be achieved through the utilization of appropriate technology (Timotheou et al., 2023). Implementation of WhatsApp Business API at STIES Darul Huda, which improves the level of response from 45% to 87%, shows the effectiveness of adoption of relevant technology with context, confirming that reception technology in developing countries is influenced by familiarity and accessibility. Research This give contribution, practical in showing that the application of lean education can be done in a way with economical cost through effective strategic and technological utilization.

Development *Standard Operating Procedures* (SOP) in all three institutions show variation, confirming the approach framework theoretical *process standardization in lean management* approach comprehensive at STIT Darul Ishlah with 47 SOPs in line with the proposition about the importance of detailed documentation to ensure consistency of the process, but also shows potential risk of over-documentation that can hinder flexibility (Lawoyin et al., 2024). The approach focuses on IAI Tulang Bawang with 23 SOPs for activity impact tall confirm Pareto principle in process improvement, where 80% of the improvement can be achieved by focusing on 20% of critical processes. The dynamic SOP approach at STIES Darul Huda shows an innovative adaptation in line with principle *agile management*, confirming findings latest *Quality Management Journal* that the approach of *living documents* produce level 25% more process compliance compared to static documentation (Gaffney et al., 2023). Improvement in significant responsiveness in all three institutions, with subtraction time response from 3-5 days become maximum of 24 hours, emphasizing findings about the

importance of process agility in build resilience organization. Implementation table service integrated customers with system information, and academic shows successful integration between lean principles and a customer-focused approach, in line with the theory of quality services proposed by Parasuraman et al. in the context of education. Thus, research This confirm effectiveness of different SOP approaches in reaching standardization of processes while maintaining organizational flexibility.

Management strategy, risk, and flexibility operations developed in the three institutions show implementation theory resilience successful organizations, as stated by (Duchek, 2020). Development matrix evaluation risks at STIT Darul Ishlah with 15 identified risks and mitigation strategies specific confirm proposition about importance management risk proactive in build resilience in institutions. Capabilities adaptation fast during the COVID-19 pandemic, with transition to successful online learning within 72 hours, showing the effectiveness lean system in respond crisis, confirming findings empirical *Crisis Management Review* that organizations with a lean infrastructure shows time response to crisis of more than 40% fast (Balfour et al., 2017). Approach planning scenario at IAI Tulang Bawang with three scenarios operational to confirm the theory management strategies proposed by Porter regarding the importance of planning contingency in an environment that is not certain. Effectiveness approach. This has been proven when institutions succeed overcome decline registration student by 25% with minimal operational implementation of agile management at STIES Darul Huda, with a monthly cycle review and indicators warning early to show adaptation principles successful application of *agile* principles in the context of education, in line with findings that predictive analytics can increase organizational responsiveness by 30% (Nomzaza, 2025). Study This give contribution theoretical with show that lean education principles can increase organizational resilience through improvement process flexibility and proactive risk management.

Optimization source Power man through multi-skilling and cross-training programs in all three institutions confirm human capital theory put forward by Becker in the context of organizational development. System rotation jobs at STIT Darul Ishlah, which trains every staff to master at least 3 different functions, showing successful implementation of a flexibility strategy, emphasizing the importance of flexibility source Power man in a limited environment source power. Increase score skills staff from 2.1 to 3.8 indicates significant improvement in significant capabilities, which are in line with theory development-based competence. Approach development-based

competency at IAI Tulang Bawang, which produces an improvement in productivity by 18% and a reduction in error level error 45 % confirmed effectiveness of focused training programs. *Talent pipeline strategy* at STIES Darul Huda, with a structured mentoring and coaching system, shows implementation theory planning successful succession, confirming the proposition results and findings previously about the importance of knowledge transfer in sustainability organizations (Zamfir, 2020). Improvement satisfaction consistent employees in all three institutions, with STIES achieving a score of satisfaction 4.2/5.0, confirm theory characteristics work that shows a positive correlation between variation skills, autonomy, and satisfaction work. Implementation initiative balance work-life and welfare programs employee show an approach holistic to management. Source Power people who are in line with the theory of welfare in the psychology organization. Thus, research This confirm that the application of lean education can increase resilience, source Power man through development of strategic talent and well- being programs for comprehensive employees.

The integration of traditional Islamic boarding school values with modern lean management principles demonstrates a successful cultural adaptation that enriches the discourse on cross-cultural organizational transformation. The concept of “Lean Pesantren” developed at IAI Tulang Bawang supports cultural integration theory by showing that successful organizational change requires alignment with local values. Islamic principles such as efficiency, quality (ihsan), and continuous improvement (istiqamah) were found to be compatible with lean principles, particularly in waste reduction and value creation (Sari et al., 2025). Similarly, the “Islamic Lean” approach at STIES Darul Huda expands traditional lean frameworks by incorporating social responsibility and stakeholder welfare, supporting stakeholder theory. These findings indicate that lean principles can be strengthened through the integration of spiritual and social values, creating a more holistic and sustainable model of organizational transformation.

The empirical findings led to the development of an “Adaptive Lean Education Model for Islamic Higher Education Institutions,” which extends traditional lean frameworks by integrating spiritual values, cultural sensitivity, and community-oriented service systems. The model demonstrated positive outcomes across the three institutions, including a 45% reduction in lead time, a 25% increase in value-added activities, and a 15% improvement in stakeholder satisfaction. These results confirm the importance of contextual adaptation in organizational development and support previous studies showing that culturally customized lean models are more effective than

direct adoption of Western lean frameworks (Hadek et al., 2023). Therefore, this model offers both theoretical and practical contributions to the development of educational management and cross-cultural organizational transformation in Islamic higher education institutions.

CONCLUSION

This study concludes that the implementation of lean education has contributed significantly to improving governance and resource resilience at STIT Darul Ishlah Tulang Bawang, IAI Tulang Bawang, and STIES Darul Huda Mesuji, Lampung. The application of lean principles, including waste elimination and process efficiency, enhanced operational performance and service quality across the three institutions. The study also identified a new dimension, namely spiritual waste, which is particularly relevant to the context of Islamic higher education and highlights the importance of integrating Islamic values into lean implementation. Furthermore, successful implementation requires effective leadership, appropriate technology utilization, and flexible operational systems. The Adaptive Lean Education Model developed in this study demonstrates that lean education can strengthen institutional resilience and support sustainable organizational transformation in Islamic higher education institutions.

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