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Digital Transformation of Economics Education at Universitas Negeri Manado

Willdy Pontoh[1], Sjeddie Watung[2], Allen Ch Manongko[3], Jerry R.H Wuisang[4*], Jety Lempas[5]
[1]Master's student in Economic Education, Faculty of Economics and Business, Manado State University
[2,3,4,5]Economics Education Study Program, Faculty of Economics and Business, Manado State University
Corresponding Author: Jerry R.H Wuisang: jerrywuisang@unima.ac.id

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A B S T R A C T

This study aims to comprehensively analyze the process and implementation of digital transformation in Economics Education learning at Universitas Negeri Manado. The study focuses on the stages of planning, implementation, and evaluation, as well as the identification of supporting and inhibiting factors and the perceptions of lecturers and students toward changes in the learning system. This research employed a qualitative method using a case study approach. The findings reveal that digital transformation in the Economics Education Study Program at Universitas Negeri Manado has been implemented through the POAC management framework (Planning, Organizing, Actuating, and Controlling) based on the university's Strategic Plan 2020–2024. Lecturers perceived digital transformation as shifting their role from knowledge providers to learning facilitators, while students appreciated the flexibility of digital access despite reporting technical obstacles and reduced social interaction. The study concludes that digital transformation at Universitas Negeri Manado remains predominantly focused on administrative digitization and is still progressing toward a more substantive transformation capable of reshaping institutional culture and pedagogical practices comprehensively.

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INTRODUCTION

The rapid advancement of digital technology has significantly transformed various sectors of human life, including higher education systems. Digital transformation is no longer limited to the use of information technology as a supporting tool; rather, it represents a comprehensive process of change that affects learning strategies, academic management systems, and the capacity of academic communities to adapt to the demands of the twenty-first century. The digital era has reshaped patterns of thinking, working, and social interaction, influencing organizational governance as well as public service mechanisms (Gandasari et al., 2021). In higher education, these changes encourage universities to redesign educational practices in ways that are more adaptive, innovative, and technology-oriented.

Despite its promising potential, the complexity of digital transformation often creates substantial challenges in implementation. Previous studies indicate that approximately 70% of digital transformation initiatives fail to achieve their intended objectives. The primary causes of failure are frequently associated not with technological limitations, but with ineffective change management processes (Ramadhany et al., 2025). This finding highlights that successful digital transformation requires not only technological infrastructure, but also human resource readiness, strategic planning, and an organizational culture that supports innovation and collaboration. Digital technology promotes more decentralized and collaborative models of interaction, compelling educational institutions to recognize both the opportunities and risks emerging from digital disruption (Rahayu et al., 2025).

In the context of economics education, digital transformation carries a more complex urgency. Contemporary economic disciplines are increasingly interconnected with developments in e-commerce, financial technology (fintech), big data analytics, and artificial intelligence (AI). Recent reports demonstrate that more than half of current occupations require digital-based competencies, particularly within economics and finance sectors (Stefán, 2023). Furthermore, while digitalization contributes to economic efficiency and innovation, it may also widen social and educational inequalities among individuals who lack adequate digital literacy (OECD, 2022). Consequently, economics education institutions are required to equip students with digital economic literacy, enabling them to utilize technology critically, ethically, and productively in both academic and professional environments.

As a public higher education institution in Indonesia, Universitas Negeri Manado plays a strategic role in promoting educational digital transformation at the regional level. Various initiatives have been implemented, including the utilization of online learning platforms, digital-based academic information systems, and innovations involving Augmented Reality (AR) technology. These initiatives reflect the institution's commitment to integrating digital technology into educational processes and improving the quality of teaching and learning. However, despite the ongoing digitalization efforts, there remains limited understanding regarding how digital transformation is substantively planned,

implemented, and evaluated at the study program level, particularly within economics education.

In many higher education institutions, a gap frequently exists between institutional digitalization policies and their actual implementation in classroom practices. Technology integration is often concentrated on administrative functions rather than being fully embedded into pedagogical approaches, curriculum development, and student-centered learning processes. Such conditions raise important questions regarding the effectiveness, sustainability, and inclusiveness of digital transformation in higher education. Therefore, investigating the practical realities of digital transformation becomes essential to identify both the opportunities and the challenges faced by educators and students.

The urgency of this study is further strengthened by the growing demand for universities to produce graduates who are capable of competing in an increasingly digitalized global economy. Higher education institutions are expected not only to adopt digital technologies, but also to ensure that these technologies contribute meaningfully to learning quality, critical thinking development, and digital competence enhancement. In developing regions, including Eastern Indonesia, empirical studies examining digital transformation in economics education remain relatively limited. Consequently, this research contributes to filling the existing research gap by providing contextual evidence from Universitas Negeri Manado. The findings are expected to offer practical recommendations for policymakers, educators, and universities in designing more effective and sustainable digital transformation strategies in higher education.

Based on these issues, this study aims to comprehensively analyze the digital transformation of economics education at Universitas Negeri Manado, focusing on planning processes, supporting and inhibiting factors, as well as lecturers' and students' perceptions toward changes in the learning system

LITERATURE REVIEW

Digital Transformation Concept

Digital transformation refers to a fundamental and comprehensive change in the way organizations operate, deliver services, and interact with stakeholders through the utilization of digital technologies. It extends beyond the simple adoption of technological tools and involves strategic, organizational, and cultural changes aimed at improving institutional performance and long-term sustainability. Contemporary digital transformation commonly incorporates technologies such as cloud computing, big data analytics, artificial intelligence (AI), and digital communication systems, all of which reshape organizational structures and decision-making processes.

According to David Rogers (2016), digital transformation within educational institutions can be analyzed through five strategic domains: customers, competition, data, innovation, and value. In the context of higher education, "customers" refer not only to students, but also to stakeholders such as lecturers, administrators, industry partners, and society. The integration of

digital technologies enables universities to redesign educational services, improve data-driven decision-making, and create innovative learning experiences that are more responsive to societal and labor market demands. Therefore, digital transformation should be understood as an institutional strategy that influences governance, pedagogy, and organizational culture simultaneously.

Furthermore, digital transformation requires organizational readiness and effective change management. Institutions that fail to develop adaptive leadership, digital competencies, and collaborative cultures often encounter difficulties in sustaining transformation initiatives. As a result, successful digital transformation depends not only on technological infrastructure, but also on human resource development and institutional commitment to innovation.

Digital Transformation in Higher Education

Digital transformation in higher education has become a critical agenda in response to globalization, technological disruption, and the increasing demand for twenty-first-century competencies. Universities are expected to establish adaptive learning ecosystems that support creativity, critical thinking, collaboration, communication, and digital literacy. Consequently, higher education institutions are progressively integrating digital technologies into academic systems, administrative management, and pedagogical practices.

One of the most significant components of digital transformation in higher education is the implementation of Learning Management Systems (LMS). LMS platforms facilitate the distribution of learning materials, assignment submissions, communication, and integrated assessment processes. In addition, the adoption of e-learning and blended learning models has transformed traditional teaching approaches into more flexible and student-centered learning environments. These models allow students to access educational resources regardless of time and location, thereby encouraging independent and collaborative learning practices.

Digital transformation in universities also involves structural and cultural changes. Lecturers are required to adapt their teaching strategies by integrating digital media, interactive technologies, and data-driven instructional methods. Simultaneously, students are expected to develop digital competencies that support lifelong learning and professional adaptability. However, several challenges remain, including unequal technological access, limited digital literacy, resistance to organizational change, and inadequate institutional support. These challenges indicate that digital transformation in higher education is a multidimensional process that requires sustainable planning and evaluation.

Human Capital Theory in Economics Education

From the perspective of economics education, education is widely regarded as an investment in human capital aimed at enhancing individual productivity, employability, and future income. Human capital theory emphasizes that education contributes to economic growth by improving knowledge, skills, and competencies required in the labor market. Thus, educational institutions play a strategic role in preparing graduates capable of adapting to technological and economic changes. Within the context of digital transformation, human capital

theory becomes increasingly relevant because digital competencies are now considered essential economic assets. The integration of digital technology into economics education enables students to acquire competencies related to digital finance, data analysis, e-commerce, and technological problem-solving. These competencies are necessary for participation in an increasingly digitalized global economy.

The implementation of educational processes can also be analyzed using the Input–Process–Output (IPO) model. In this framework, digital infrastructure, technological resources, and lecturer competencies function as educational inputs. The learning process includes the integration of digital pedagogies, online learning systems, and technology-based interactions between lecturers and students. The expected outputs and outcomes include improved digital literacy, critical thinking skills, and graduates who possess strong competencies in digital economics. Therefore, digital transformation can be understood as a strategic mechanism for strengthening the quality of human capital in higher education.

Previous Relevant Studies

Several previous studies provide important foundations for this research. A study conducted by Arsana et al. (2025) revealed that e-administration transformation within economics education departments significantly improved administrative efficiency and positively affected learning quality. The findings demonstrate that digital systems can support more effective academic services and enhance institutional performance.

However, a literature review by Setiowati et al. (2026) indicated that digital transformation in Indonesia is still predominantly focused on administrative digitization rather than substantive transformation. Many higher education institutions continue to emphasize digital document management and online administration without fundamentally transforming pedagogical approaches or fostering students' critical thinking skills. This suggests that the implementation of digital transformation remains uneven and often limited to technical aspects rather than educational innovation.

In addition, Rahman et al. (2024) emphasized the importance of effective change management in supporting digital transformation initiatives. Their study highlighted that resistance to organizational change, limited digital competencies, and inadequate leadership support are among the primary barriers to successful technology adoption in educational institutions. Effective leadership, institutional collaboration, and continuous professional development were identified as essential factors for sustaining digital transformation processes.

Although previous studies have discussed digital transformation in education, limited research specifically examines how digital transformation is implemented in economics education at regional public universities in Indonesia, particularly in Eastern Indonesia. Therefore, this study seeks to address this gap by analyzing the planning, implementation, supporting factors, inhibiting factors, and perceptions of lecturers and students regarding digital transformation in economics education at Universitas Negeri Manado.

METHODOLOGY

Research Design

This study employed a descriptive qualitative approach using a case study design to explore the implementation of digital transformation in economics education at Universitas Negeri Manado. A qualitative case study was considered appropriate because the research aimed to obtain an in-depth understanding of institutional experiences, learning processes, and stakeholder perceptions related to digital transformation within a specific educational context. The study was conducted at the Department of Economics Education, Faculty of Economics and Business, during the second semester of the 2025/2026 academic year over a six-month period.

The research adopted the Input–Process–Output (IPO) framework to analyze the relationship between institutional resources, learning dynamics, and digital literacy outcomes. Within this framework, digital infrastructure, institutional policies, and human resources were positioned as inputs; teaching and learning activities represented the process dimension; while students' digital competencies and perceptions of learning transformation constituted the outputs and outcomes. The IPO framework enabled a systematic examination of how digital transformation was planned, implemented, and evaluated within the educational environment (Bushnell, 1990; Sugiyono, 2019).

Research Participants

Research participants were selected using purposive sampling to ensure that the selected informants possessed relevant experiences and knowledge regarding digital transformation in economics education. The study involved five key informants representing major stakeholders within the faculty, including faculty leaders, lecturers, and students. These participants were selected based on their direct involvement in academic management, digital learning implementation, and participation in technology-based educational activities. Purposive sampling was considered suitable because qualitative research prioritizes the depth and relevance of information rather than statistical generalization (Creswell, 2018). The diversity of participants allowed the researcher to obtain multiple perspectives concerning institutional policies, pedagogical practices, and student experiences in digital learning environments.

Data Collection Techniques

Data were collected through a multi-method approach consisting of in-depth interviews, passive participatory observation, and document analysis. This combination of techniques was intended to strengthen the comprehensiveness and credibility of the findings.

First, in-depth interviews were conducted with all key informants to explore their experiences, perceptions, and evaluations regarding digital transformation in economics education. Semi-structured interview guidelines were used to allow flexibility in exploring emerging themes while maintaining alignment with the research objectives. Second, passive participatory observation was carried out to examine the implementation of digital learning practices within the institutional environment. Observations focused on the use of the

Learning Management System (LMS) "Amelia," classroom interactions, and the availability of supporting digital infrastructure and campus facilities. Through observation, the researcher was able to capture actual practices and learning dynamics that might not fully emerge during interviews. Third, document analysis was conducted on institutional and academic documents, including the University Strategic Plan (Renstra UNIMA 2020–2024), curriculum documents, digital learning policies, and other supporting academic records. These documents provided contextual and policy-based information concerning the university's digital transformation agenda.

Data Analysis

Data analysis was conducted interactively following the model developed by Matthew B. Miles, A. Michael Huberman, and Johnny Saldaña (2014), which consists of three main stages: data reduction, data display, and conclusion drawing/verification. During the data reduction stage, interview transcripts, observation notes, and documents were organized, coded, and categorized according to emerging themes related to digital transformation. The second stage involved presenting the data through thematic analysis to identify patterns, relationships, and recurring issues across participant experiences and institutional practices. Finally, conclusions were drawn and continuously verified throughout the research process to ensure consistency between empirical findings and theoretical interpretations. To strengthen the strategic analysis, the study also utilized Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) matrices. These analytical tools were employed to identify internal strengths and weaknesses, as well as external opportunities and challenges influencing the implementation of digital transformation within the institution.

Trustworthiness of the Study

To ensure the trustworthiness of the findings, the study applied several validation strategies. Source triangulation and technique triangulation were used to compare information obtained from different participants and data collection methods. The researcher also increased observational persistence by repeatedly examining learning activities, institutional practices, and supporting documents to ensure data consistency and contextual accuracy. Furthermore, the integration of interview findings, observational evidence, and policy documents enhanced the credibility and dependability of the research results. These procedures were conducted to ensure that the findings accurately reflected the realities of digital transformation implementation within the economics education program at Universitas Negeri Manado.

RESEARCH RESULT

Digital Transformation Process and Implementation

The findings reveal that digital transformation within the Economics Education Program at Universitas Negeri Manado has been implemented through the POAC management framework, consisting of Planning, Organizing, Actuating, and Controlling stages. The implementation process was aligned with

the university's Strategic Plan (Renstra) 2020–2024 and aimed to strengthen institutional adaptation toward digital-based higher education.

At the planning stage, the institution adopted a participatory approach by synchronizing the university's vision with practical educational needs in the field. Curriculum development gradually incorporated digital economy-related content, including discussions on fintech, e-commerce, and technology-based economic systems. This initiative reflects the institution's awareness of the growing importance of digital competencies in economics education.

In the implementation stage, digital learning activities were primarily facilitated through the centralized Learning Management System (LMS) "Amelia." The LMS was complemented by external digital platforms such as Google Classroom, Zoom, and Google Meet to support hybrid learning practices. These technologies enabled lecturers and students to conduct synchronous and asynchronous learning activities more flexibly.

However, the findings indicate that the current transformation process remains largely concentrated on administrative digitization rather than substantive pedagogical transformation. Approximately 70% of digital implementation was still focused on converting manual administrative activities into digital formats, including attendance systems, assignment submissions, and academic documentation. The integration of technology into teaching methods, critical thinking development, and interactive student-centered pedagogies remained relatively limited. This finding suggests that digital transformation within the institution is still in the transitional phase from digitization toward deeper educational transformation.

Supporting and Inhibiting Factors

The implementation of digital transformation was influenced by several supporting and inhibiting factors identified during the study.

- **Supporting Factors**

One of the primary supporting factors was the strong commitment of institutional leaders toward digital transformation initiatives. Faculty and university leaders actively encouraged the integration of technology into academic and administrative systems. In addition, the centralized management of information and communication technology (ICT) infrastructure by the Academic Support Unit (UPA ICT) contributed significantly to system coordination and technological maintenance.

The availability of supporting facilities, including computer laboratories, fiber optic internet networks, and campus digital infrastructure, also strengthened the implementation process. Furthermore, younger lecturers demonstrated relatively high levels of digital literacy and adaptability, which became an important form of human capital in promoting technology-based learning innovation. Their familiarity with digital platforms facilitated the adoption of online learning methods and collaborative digital communication.

- **Inhibiting Factors**

Despite these supporting conditions, several barriers constrained the effectiveness of digital transformation. Technical obstacles included unstable internet connectivity, bandwidth bottlenecks, and occasional disruptions within

the LMS platform. These issues frequently affected the continuity and effectiveness of online learning activities.

From the student perspective, the high cost of internet data access remained a significant challenge, particularly for students from economically disadvantaged backgrounds. In addition, the study identified internal resistance among several senior educators who tended to maintain conventional teaching approaches and demonstrated limited readiness to adopt digital pedagogies.

Another important challenge identified in this study was the emergence of digital fatigue among students. The simultaneous use of multiple, non-standardized digital platforms created fragmented learning experiences and increased cognitive burden. Students often reported confusion when navigating different systems used by different lecturers, resulting in reduced learning efficiency and engagement.

Lecturers' and Students' Perceptions

The findings demonstrate differing perceptions among stakeholders regarding the implementation of digital transformation.

- **Lecturers' Perspectives**

Lecturers generally perceived digital transformation as a strategic necessity for improving the flexibility and accessibility of learning materials. Digital platforms enabled lecturers to distribute resources more efficiently and maintain communication with students beyond conventional classroom boundaries. Many lecturers acknowledged a shift in their professional role from being the sole source of knowledge toward functioning as facilitators and motivators within student-centered learning environments.

Nevertheless, lecturers also expressed critical concerns regarding the quality of conceptual understanding achieved through digital learning environments. Several participants argued that excessive reliance on digital platforms could reduce the depth of discussion, critical engagement, and direct interaction between lecturers and students. This indicates that while technology enhances accessibility, it does not automatically guarantee deeper learning quality.

- **Students' Perspectives**

Students generally appreciated the flexibility provided by digital learning systems, particularly the ability to access learning materials anytime and anywhere. The implementation of online learning also increased opportunities for independent learning and technological familiarity.

However, first-year students frequently experienced difficulties adapting to the fragmented digital ecosystem. The absence of standardized platform usage across courses created confusion and increased academic stress. Students also reported reduced social interaction and emotional engagement compared with face-to-face learning environments. This finding suggests that digital transformation influences not only academic processes but also students' social learning experiences.

Implications for Digital Economic Literacy

The study found that digital transformation contributed positively to students' understanding of emerging digital economic ecosystems, particularly in areas such as fintech, e-commerce, and online financial transactions. Exposure

to digital learning environments increased students' familiarity with technology-based economic activities and enhanced their practical engagement with digital platforms.

However, the level of digital economic literacy remained partial and uneven. While most students demonstrated competence in basic technology use and digital financial transactions, many still exhibited limited understanding of cybersecurity, digital ethics, and financial risk mitigation. The findings revealed that students' cybersecurity literacy scores remained relatively low, averaging only 58%, indicating weaknesses in recognizing digital threats and protecting personal financial information.

Strategically, the IFAS and EFAS matrix analysis positioned Universitas Negeri Manado in Quadrant I (Aggressive Strategy). This position indicates that the institution possesses sufficient internal strengths to capitalize on external digital opportunities proactively. Nevertheless, the sustainability of digital transformation will depend on the institution's ability to address systemic challenges related to change management, technological standardization, and digital competency development among both lecturers and students.

DISCUSSION

Digital Transformation within the Learning Ecosystem

The findings indicate that digital transformation in the Economics Education Program at Universitas Negeri Manado represents a complex and systemic process aimed at responding to the challenges of global digital disruption. Using the Input–Process–Output (IPO) framework, institutional digitalization policies and technological infrastructure function as the primary inputs that shape innovative learning processes and ultimately influence the development of graduates with digital economic competencies as educational outputs.

The implementation of digital technologies, including the use of the "Amelia" Learning Management System (LMS) and hybrid learning models, demonstrates that the institution has moved beyond the simple adoption of technological tools. The transformation process has gradually influenced curriculum restructuring and instructional strategy development. This finding supports the perspective of David Rogers (2016), who argues that digital transformation in higher education should encompass strategic dimensions of innovation and value creation in order to improve information accessibility and educational service quality sustainably.

The integration of digital platforms has enabled greater flexibility in learning activities, improved access to educational resources, and expanded opportunities for collaborative learning. Hybrid learning systems also provide students with more adaptive learning experiences that align with the demands of twenty-first-century education. In this regard, digital transformation contributes not only to institutional modernization but also to the creation of more student-centered learning environments. However, the study also reveals a significant paradox. Although digital technologies have been widely implemented, approximately 70% of the transformation process remains

concentrated on administrative digitization rather than substantive pedagogical transformation. Technology is primarily utilized to convert manual administrative processes into digital formats, such as attendance systems, assignment submission, and academic record management, rather than fundamentally redesigning learning approaches and critical thinking development. This condition reinforces the findings of Setiowati et al. (2026), who argue that digitalization in Indonesian higher education frequently remains procedural and has not fully transformed students' cognitive engagement and critical reasoning capacities. This phenomenon suggests that digital transformation in higher education cannot be evaluated solely through the availability of technology or the number of digital platforms adopted. Instead, the effectiveness of transformation depends on how technology is pedagogically integrated into teaching and learning practices. Without meaningful instructional innovation, digital transformation risks becoming merely a technical modernization process rather than a transformative educational reform.

Change Management and Human Resource Capacity

The findings further demonstrate that the success of digital transformation is strongly determined by change management and the readiness of human resources rather than technological sophistication alone. Differences in digital literacy levels between younger and senior lecturers illustrate that human factors remain the primary determinant of educational transformation quality. Younger lecturers tended to demonstrate higher adaptability, stronger technological confidence, and greater willingness to experiment with innovative teaching approaches. In contrast, several senior educators remained more comfortable with conventional instructional practices and showed relatively lower levels of readiness for digital pedagogical integration (Romandar, 2025)..

This finding is consistent with previous studies emphasizing that organizational resistance and ineffective change management constitute major barriers to successful digital transformation. The persistence of conventional teaching cultures indicates that institutional transformation requires continuous professional development, leadership support, and collaborative adaptation processes. In this context, technology adoption should not be understood merely as a technical issue, but as a cultural and organizational transition that affects institutional identity, teaching practices, and academic interactions.

The study also highlights the relevance of local cultural values in supporting digital transformation processes. Within the context of Universitas Negeri Manado, the indigenous value of *Mapalus*—which emphasizes cooperation and mutual assistance—emerged as an important social foundation for developing collaborative digital learning environments. The integration of local wisdom into digital transformation initiatives demonstrates that technological modernization does not necessarily eliminate cultural identity; instead, local values can strengthen institutional resilience and collective adaptation in digital ecosystems.

From the perspective of Human Capital Theory, digital transformation in economics education can be interpreted as a strategic investment in human

resource development. According to this perspective, education enhances productivity, employability, and economic competitiveness through the development of relevant competencies. In the digital era, competencies related to technological literacy, problem-solving, collaboration, and data analysis have become increasingly important components of human capital.

The implementation of active learning approaches such as Case Method and Project-Based Learning (PjBL) further supports the development of these competencies. These approaches encourage students to engage in critical analysis, collaborative problem-solving, and practical application of economic concepts within digital contexts. Consequently, digital transformation contributes not only to technological modernization but also to the preparation of graduates capable of competing in increasingly dynamic and technology-driven labor markets, in line with competencies emphasized by the World Economic Forum.

Governance and Integrated Technology Architecture

The findings indicate that the absence of a formal Enterprise Architecture (EA) standard at Universitas Negeri Manado constitutes one of the primary structural barriers to sustainable digital transformation. The lack of integrated technological governance has resulted in fragmented systems and the emergence of "digital silos," where different academic units utilize diverse platforms without institutional standardization. Consequently, coordination among stakeholders becomes less efficient, and students experience increased cognitive burdens due to the need to adapt to multiple disconnected systems simultaneously.

The fragmented use of digital platforms not only affects administrative coordination but also influences the quality of learning experiences. Students frequently reported confusion caused by inconsistent technological environments across courses, while lecturers encountered difficulties in synchronizing learning activities and assessment systems. These findings suggest that digital transformation requires not only technological adoption but also integrated governance structures capable of ensuring interoperability, consistency, and institutional alignment.

In this context, the implementation of Agile IT Governance becomes increasingly relevant. Agile governance approaches emphasize flexibility, adaptability, and responsiveness in managing technological systems within dynamic digital environments. Through integrated governance mechanisms, universities can align technological architecture with institutional objectives, pedagogical innovation, and stakeholder needs more effectively. Such an approach also supports continuous system evaluation and improvement, enabling institutions to respond rapidly to technological and educational changes Arsana dkk. (2025).

The findings further support previous studies arguing that digital transformation initiatives should not be isolated within administrative modernization alone. Instead, investments in e-administration systems must contribute directly to pedagogical quality enhancement and learning innovation. Administrative efficiency can function as an enabling factor for educational

quality when technological systems are integrated strategically and support meaningful learning interactions. Therefore, sustainable digital transformation can only be achieved through synchronization among leadership vision, integrated technological architecture, and continuous human resource capacity development.

Moreover, the absence of a unified technological framework illustrates the importance of institutional digital governance in higher education. Without comprehensive governance structures, digital transformation risks becoming fragmented, inconsistent, and difficult to sustain. Accordingly, universities need to establish institutional standards for platform integration, digital learning policies, and data management systems to create more coherent and efficient educational ecosystems.

Analysis of Supporting and Inhibiting Factors in Digital Transformation

The strategic analysis conducted using the Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) matrices positioned Universitas Negeri Manado within Quadrant I (Aggressive Strategy), with an IFAS score of 1.4 and an EFAS score of 0.2. This position indicates that the institution possesses relatively strong internal capabilities and favorable opportunities to implement digital transformation expansively and proactively.

- **Supporting Factors**

One of the strongest supporting factors identified in this study was leadership commitment at both university and faculty levels. Institutional leaders demonstrated strategic support for digital transformation through the establishment of ICT service management procedures, quality assurance mechanisms, and policies encouraging technology integration in educational practices. Leadership support played a critical role in shaping institutional readiness and fostering a culture of innovation within the academic environment.

The availability of digital infrastructure also served as a major enabling factor. Facilities such as the "Amelia" LMS, campus internet networks, computer laboratories, and centralized ICT management systems facilitated more flexible access to learning materials and academic services. These findings support previous research emphasizing that technological accessibility significantly contributes to the effectiveness of digital learning environments.

Furthermore, the relatively high digital literacy levels among younger lecturers strengthened the institution's adaptive capacity. Their ability to utilize digital tools and experiment with innovative pedagogical approaches accelerated the implementation of technology-based learning activities.

- **Structural and Technical Barriers**

Despite these supporting conditions, several structural and technical barriers limited the effectiveness of digital transformation. The absence of formal Enterprise Architecture standards caused system development to remain unit-driven and fragmented, leading to the emergence of isolated digital systems and data silos. As a result, institutional coordination and technological interoperability became less effective.

Technical constraints such as unstable internet connectivity, bandwidth limitations, and unequal access to technological devices among students further

disrupted the learning process. These limitations particularly affected students from economically disadvantaged backgrounds, thereby raising concerns regarding educational equity in digital learning environments.

In addition, the findings demonstrate that approximately 70% of digital transformation efforts remained concentrated on digitization processes rather than substantive pedagogical reform. The dominant focus on administrative efficiency indicates that institutional transformation has not yet fully shifted toward deeper instructional innovation and critical learning development. This reinforces previous studies suggesting that digital transformation in many higher education institutions remains procedural rather than transformative.

- **Human Resource Readiness**

The study also confirms that the primary determinant of successful digital transformation is human resource readiness rather than technology itself. Resistance to change among several educators revealed that institutional transformation is deeply influenced by organizational culture, adaptability, and professional motivation. Some lecturers continued to rely heavily on conventional teaching approaches and demonstrated reluctance to integrate digital pedagogies into classroom practices.

In addition, generational differences in digital literacy created disparities in technology adoption and instructional innovation. Younger lecturers generally exhibited higher confidence and adaptability in using digital platforms, while senior lecturers often required additional institutional support and professional development opportunities.

From the perspective of Human Capital Theory, strengthening digital literacy among educators and students should be regarded as a strategic investment in institutional competitiveness and educational quality. Continuous training, mentoring, and collaborative learning initiatives are therefore necessary to improve digital competencies across academic communities. Without systematic human resource development, technological investments alone will not be sufficient to produce meaningful and sustainable educational transformation

Stakeholder Perception Dynamics

The findings reveal significant differences in perception between lecturers and students regarding the implementation of digital transformation. Lecturers tended to emphasize strategic and pedagogical dimensions, whereas students focused more strongly on user experience and the practical usability of digital systems. These differing perspectives illustrate that digital transformation in higher education affects stakeholders in distinct ways depending on their roles, expectations, and daily interactions with technology.

- **Educators' Perspectives**

Lecturers generally perceived digital transformation as an unavoidable necessity for maintaining academic relevance and global competitiveness. The integration of digital technology was viewed as essential for aligning economics education with the realities of the contemporary digital economy. Many lecturers recognized that technology-enabled learning environments could improve flexibility, accessibility, and opportunities for collaborative learning.

However, the findings also revealed what can be described as a "depth paradox." Although students demonstrated increasing technical proficiency in operating digital platforms and accessing online information, these competencies did not always correspond with deeper conceptual understanding of economic theories and critical analysis. Lecturers expressed concerns that technology-based learning environments may encourage superficial engagement with content when not accompanied by reflective and analytical pedagogical strategies.

This finding suggests that digital competence alone is insufficient to ensure meaningful educational outcomes. The effectiveness of digital transformation depends on the institution's ability to balance technological accessibility with pedagogical depth. Consequently, lecturers increasingly assumed the role of facilitators who guide students in interpreting information critically rather than merely delivering content.

- **Students' Perspectives**

Students generally appreciated the convenience and flexibility provided by digital learning systems. The ability to access learning materials regardless of time and location was perceived as a major advantage, particularly in supporting independent learning practices. Digital platforms also enabled faster communication and easier access to academic resources.

Nevertheless, students reported experiencing symptoms of digital fatigue caused by prolonged screen interaction, repetitive online learning routines, and fragmented technological environments. First-year students, in particular, frequently felt overwhelmed by the inconsistent use of multiple digital platforms across courses. This condition increased cognitive burdens because students were required to continuously adapt to different systems, interfaces, and instructional procedures.

The findings demonstrate that the absence of standardized Enterprise Architecture contributes not only to institutional inefficiency but also to reduced student learning comfort and engagement. Inconsistent platform usage created confusion and negatively influenced students' motivation and concentration during online learning activities.

- **Synthesis within the IPO Framework**

Within the Input–Process–Output (IPO) framework, lecturers primarily emphasized the process dimension of learning transformation, particularly through approaches such as Case Method and interactive digital pedagogy. Students, meanwhile, were more sensitive to infrastructural inputs, including internet stability, platform accessibility, and technological usability.

The findings indicate that the effectiveness of lecturers' roles as facilitators is highly dependent on technical stability and infrastructural reliability. Technical disruptions, unstable internet connections, and platform failures frequently interrupted learning interactions and contributed to declining student motivation. This demonstrates that pedagogical innovation cannot function effectively without adequate technological support.

Therefore, digital transformation in higher education should be understood as an interconnected ecosystem in which infrastructure, pedagogy, governance,

and stakeholder experiences mutually influence one another. Sustainable transformation requires balanced attention to both technological systems and human-centered educational experiences.

Digital Economic Literacy as an Educational Output

The study found that digital economic literacy has become one of the most important educational outputs in responding to the demands of the twenty-first century. The increasing integration of digital technology into economic activities requires universities to prepare graduates who possess not only technical abilities but also critical understanding of digital economic systems. This need aligns with reports from the World Economic Forum indicating that more than half of future occupations will require advanced digital competencies.

- **Gaps in Competency Development**

Although students demonstrated relatively high understanding of digital financial transactions, reaching approximately 83%, their active involvement as digital business innovators remained considerably lower at only 42%. This finding reflects a significant competency gap between technological consumption and productive digital innovation.

Students generally possessed adequate abilities in using digital applications and conducting online transactions, yet many still lacked deeper understanding of economic logic, digital entrepreneurship, and financial risk mitigation. This condition illustrates a "proficiency paradox," in which technical familiarity does not necessarily translate into critical economic reasoning or innovation capacity.

The findings indicate that digital transformation in economics education should move beyond operational technology use toward fostering higher-order thinking skills, entrepreneurial competencies, and analytical capabilities related to digital economic ecosystems.

- **Impact of System Fragmentation**

The dominance of digitization-oriented practices also affected the integration of digital economic literacy within the curriculum. In many cases, digital economy topics functioned merely as supplementary or add-on materials rather than becoming systematically embedded within learning structures and instructional design.

Furthermore, the absence of formal Enterprise Architecture standards caused students to spend considerable cognitive energy adapting to fragmented technological systems instead of focusing on substantive economic learning. As a result, technological complexity sometimes distracted students from deeper conceptual engagement with digital economic issues.

These findings suggest that technological governance and curriculum integration are closely interconnected. Effective digital transformation requires coherent technological systems that support rather than hinder learning processes (Romandar, 2025)..

Cybersecurity Literacy and Future Challenges

Another important finding concerns the relatively low level of cybersecurity literacy among students, with average literacy scores reaching only 58%. This condition indicates vulnerability to digital financial fraud, misinformation, and unsafe online economic practices. In the context of rapidly

expanding fintech and e-commerce ecosystems, inadequate cybersecurity awareness represents a significant educational challenge (Yuangga, 2023).

Consequently, economics education institutions must adapt by integrating more contextual and practice-oriented learning approaches such as Project-Based Learning (PjBL). Through these approaches, students can develop not only theoretical understanding but also practical problem-solving abilities relevant to digital economic environments. Such competencies are increasingly important within the context of Society 5.0, where technological innovation and human-centered development are closely interconnected (Romandar, 2025)..

The findings further indicate that future digital transformation strategies should adopt Agile IT Governance approaches capable of integrating curriculum development, technological systems, and industry collaboration more systematically. Stronger collaboration between universities and industry stakeholders is necessary to ensure that graduates possess competencies aligned with labor market demands and emerging digital economic trends.

CONCLUSIONS

This study concludes that digital transformation in the Economics Education Program at Universitas Negeri Manado represents a strategic institutional effort to respond to the challenges of digital disruption and the demands of twenty-first-century education. The transformation process has been implemented through the integration of digital infrastructure, Learning Management Systems (LMS), hybrid learning models, and curriculum adjustments that incorporate elements of digital economics. Using the Input–Process–Output (IPO) framework, the study demonstrates that institutional policies and technological infrastructure function as key inputs influencing learning processes and the development of students' digital economic competencies.

However, the findings reveal that the current transformation remains predominantly focused on administrative digitization rather than substantive pedagogical transformation. Approximately 70% of digital implementation activities are still oriented toward converting conventional administrative processes into digital formats, while deeper instructional innovation and critical learning transformation remain limited. This condition indicates that digital transformation within higher education institutions is still in a transitional stage from technical modernization toward holistic educational reform.

The study further identifies that leadership commitment, centralized ICT management, technological infrastructure, and the digital adaptability of younger lecturers constitute major supporting factors in the transformation process. Conversely, several inhibiting factors were also identified, including fragmented technological systems, unstable internet connectivity, unequal access to digital devices, resistance to change among some educators, and the emergence of digital fatigue among students. The absence of a formal Enterprise Architecture framework contributes significantly to system fragmentation and inefficiencies within digital learning environments. The findings also

demonstrate differing stakeholder perceptions regarding digital transformation. Lecturers emphasized the pedagogical and strategic importance of digitalization, whereas students were more concerned with usability, accessibility, and learning experience quality. Although students generally appreciated the flexibility of digital learning systems, many also experienced cognitive overload due to the inconsistent use of multiple platforms.

In terms of educational outcomes, digital transformation has contributed positively to the improvement of students' digital economic literacy, particularly in understanding fintech, e-commerce, and online financial transactions. Nevertheless, students' competencies remain uneven, especially in areas related to cybersecurity awareness, financial risk mitigation, and digital innovation capacity. This finding indicates that economics education institutions must move beyond basic technological literacy toward developing critical, analytical, and innovation-oriented digital competencies. Strategically, the IFAS and EFAS analysis positions Universitas Negeri Manado within Quadrant I (Aggressive Strategy), suggesting that the institution possesses strong internal potential to expand digital transformation initiatives. However, sustainable transformation will require integrated technological governance, effective change management, and continuous investment in human capital development.

RECOMMENDATIONS

Based on the findings of this study, several recommendations are proposed to strengthen the sustainability and effectiveness of digital transformation in higher education, particularly in economics education programs.

First, universities should develop a formal and integrated Enterprise Architecture (EA) framework to reduce system fragmentation and establish standardized digital learning environments across faculties and study programs. Integrated technological governance is essential for improving coordination, interoperability, and user experience among lecturers and students. Second, digital transformation initiatives should move beyond administrative digitization toward deeper pedagogical innovation. Universities need to encourage the implementation of student-centered learning approaches, such as Case Method and Project-Based Learning (PjBL), that integrate digital economic issues into instructional practices and promote critical thinking, collaboration, and problem-solving skills.

Third, continuous professional development programs should be provided to strengthen lecturers' digital competencies and reduce resistance to technological change. Training activities should focus not only on technical platform usage but also on digital pedagogy, instructional design, and innovative learning strategies. Fourth, institutions should improve technological accessibility and infrastructure stability, particularly internet connectivity and platform reliability, to ensure equitable learning opportunities for students from diverse socioeconomic backgrounds. The simplification and standardization of digital platforms are also necessary to minimize cognitive overload and digital fatigue among students.

Fifth, economics education curricula should place stronger emphasis on digital economic literacy, including cybersecurity awareness, financial risk management, digital entrepreneurship, and ethical technology usage. Collaboration with industry partners should also be expanded to ensure that learning outcomes remain relevant to labor market demands and technological developments. Finally, future studies are encouraged to explore digital transformation in broader institutional contexts and utilize mixed-method or comparative approaches to obtain deeper understanding of the long-term impacts of digital transformation on educational quality, student competencies, and institutional competitiveness in higher education.

ADVANCED RESEARCH

This study contributes to the growing discourse on digital transformation in higher education by providing empirical evidence from economics education in Eastern Indonesia, particularly at Universitas Negeri Manado. The findings demonstrate that digital transformation is not merely a technological shift, but a multidimensional process involving governance, pedagogy, human resource readiness, and digital literacy development. The study advances previous research by integrating the Input–Process–Output (IPO) framework with analyses of Agile IT Governance, Human Capital Theory, and stakeholder perceptions. It highlights that sustainable digital transformation depends on the alignment between institutional leadership, integrated technological architecture, and pedagogical innovation. Furthermore, this research identifies the persistence of administrative digitization dominance, the emergence of digital fatigue, and the gap between technological proficiency and critical economic literacy as important issues requiring further scholarly attention. Future research is recommended to examine comparative digital transformation models across universities, investigate the long-term impact of digital learning on student competencies, and explore the effectiveness of integrated digital governance frameworks in supporting educational innovation and institutional competitiveness.

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