

The Implementation of Digital Ecosystem in English Education Context as Part of Institutional Strategy: A Case Study in UIN Syahada Padangsidimpuan

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Article Info	ABSTRACT
Article history: Received Apr 29, 2026 Revised May 12, 2026 Accepted Nov 01, 2026 Corresponding Author: Hamka, Jalan Tengku Rizal Nurdin No. Km. 4, Kelurahan Sihitang, Kecamatan Padangsidimpuan Tenggara, Kota Padang Sidempuan, Sumatera Utara, 22733. hamka@uinsyahada.ac.id	The rapid development of digital technology has encouraged higher education institutions to adopt digital transformation strategies to improve institutional performance. However, studies on the role of integrated digital ecosystems in English education performance remained limited. This study aimed to examine how digital ecosystem development functions as an institutional strategy to enhance English education performance at UIN Syahada Padangsidimpuan. A qualitative case study design was employed. Data were collected through interviews, observations, and document analysis, and were analyzed thematically. The findings showed that digital ecosystem development served as an institutional strategy integrating learning processes, academic services, and institutional management. This ecosystem was built through the alignment of technological infrastructure, academic information systems, digital learning platforms, and human resource readiness. These components are interconnected and support institutional effectiveness. The study identified three key contributions to performance: improved learning quality, increased service efficiency, and strengthened data-driven management. This study provided a comprehensive understanding of ecosystem-based digital transformation and highlighted its role in enhancing English education performance. Keywords: Digital transformation, digital ecosystem, English education performance, institutional strategy, educational performance

1. INTRODUCTION

Digital technology has transformed higher education systems worldwide, reshaping the way universities deliver instruction, manage academic services, and organize institutional processes. Universities are increasingly integrating digital tools into teaching, administration, and governance to enhance efficiency and the quality of education. Previous studies indicate that digital transformation improves access to learning, supports innovation, and enhances institutional performance (Benavides et al. 2020; Tang et al. 2025).

The significance of digital transformation is particularly evident in English language education, where technology has become an essential component of teaching and learning processes. Digital platforms, learning management systems, artificial intelligence tools, online collaboration applications, and multimedia resources have expanded opportunities for language exposure, communication, and personalized learning. These technologies enable students to develop language skills through interactive learning environments while allowing educators to design more flexible and student-centered instruction (Kohnke et al., 2023; Godwin-Jones, 2022). As English proficiency is increasingly required in global academic and professional contexts, higher education institutions must ensure that their digital environments effectively support English language learning and teaching.

In contemporary higher education, universities operate as knowledge-based organizations that rely on digital systems to support learning innovation and institutional management (Suparwadi et al., 2024; Nugroho et al., 2025). Digital transformation is not limited to the adoption of technology. It involves structural changes in organizational processes, institutional strategies, and academic culture (Leal Filho et al. 2024; Zhukabayeva et al. 2025; Tiwari, 2024). This shift has given rise to the concept of a digital ecosystem, which integrates technological infrastructure, academic information systems, digital learning platforms, data-driven governance, and human resource readiness into a unified system (Ifenthaler et al., 2021; Selwyn, 2024). A well-developed digital ecosystem enables universities to enhance the quality of learning, streamline academic services, and strengthen institutional performance.

Although critical, the implementation of digital transformation in higher education remains uneven. Evidence from multiple studies indicates that digital transformation faces several barriers, including inadequate technological infrastructure, limited staff digital competence, weak institutional leadership, and resistance to organizational change (Benavides et al., 2020; Delcker & Ifenthaler, 2022). Furthermore, many institutions continue to adopt digital technologies in silos, focusing on standalone tools rather than developing an integrated digital ecosystem (Castañeda & Selwyn, 2024). These challenges suggest that successful digital transformation requires a comprehensive institutional strategy that integrates technological, organizational, and human resource factors.

Existing studies have largely focused on specific aspects of digital transformation, such as the use of learning management systems, online learning practices, and digital academic services (Al-Fraihat et al. 2020; Martin et al., 2020; Almarashdeh, 2016; Alemneh, 2023). Although these studies provide valuable insights, they tend to examine digital technologies in isolation. Research exploring digital transformation from the perspective of a holistic digital ecosystem that connects infrastructure, governance, learning systems, and human resource capacity within a single analytical framework remains limited.

This limitation becomes even more apparent in the context of Islamic higher education. Research on digital transformation in Islamic universities remains limited and often focuses on the general adoption of technology rather than the development of institutional ecosystems. Consequently, there is a lack of empirical evidence explaining how digital ecosystems can function as institutional strategies to strengthen educational performance in Islamic higher education, particularly in developing countries such as Indonesia. To address this gap, this study examines the development of a digital ecosystem as an institutional strategy to strengthen English education performance at UIN Syahada Padangsidempuan. Understanding how digital ecosystems support English language teaching is particularly important because language learning increasingly depends on technology-mediated interaction, digital resources, and online learning environments. In this study, the digital ecosystem is examined specifically in relation to its contribution to English language teaching and learning rather than to the overall institutional performance of the university.

2. LITERATURE REVIEW

2.1. Digital Transformation as Institutional Strategy

Digital transformation in higher education refers to systematic efforts to integrate digital technology into learning processes, academic services, and institutional management to improve overall performance (Gkrimpizi et al., 2024). This is not merely the implementation of technological tools, but a strategic transformation that reshapes organizational structures, institutional policies, and academic practices. Bond et al. (2021) explain that digital transformation involves changes in learning practices, governance, and organizational strategies supported by digital technology. Similarly, Bygstad et al. (2022) emphasize that digital transformation encompasses shifts in institutional culture and educational models that are responsive to technological advancements. Therefore, universities are required to prioritize digital transformation as an institutional strategy to enhance competitiveness and performance.

Advances in information and communication technology have driven higher education institutions to adopt various digital systems to support academic and administrative processes. The integration of systems such as learning management systems, academic information systems, digital libraries, and online administrative services has become a hallmark of modern higher education (Almarashdeh, 2016; Al-Fraihat et

al., 2020). These systems enable more efficient academic services, a flexible learning environment, and better access to educational resources. Additionally, digital technology supports data-driven decision-making by allowing institutions to manage and analyze academic data more effectively.

Beyond the adoption of technology, digital transformation is also driving the development of innovative learning models. The integration of digital tools enables the implementation of blended and online learning approaches that combine flexibility with interactive learning experiences (Hrastinski, 2019). Digital-based collaborative learning is increasingly enhancing student engagement and participation (Martin et al., 2020). These developments indicate that digital transformation contributes not only to improved teaching but also to the institution's broader effectiveness.

The impact of digital transformation is particularly significant in English education, where technology has become an integral component of language teaching and learning. Digital platforms, learning management systems, online communication tools, artificial intelligence applications, and multimedia resources provide opportunities for authentic language exposure, interaction, and collaboration beyond the traditional classroom (Godwin-Jones, 2024; Kohnke et al., 2023). These technologies support the development of students' speaking, listening, reading, and writing skills through flexible and interactive learning environments. Furthermore, digital technologies enable English educators to implement student-centered learning approaches, personalize instructional activities, and provide timely feedback, thereby enhancing learning effectiveness and student engagement.

However, the success of digital transformation depends on how institutions strategically manage the transformation process. Gong & Ribiere (2021) argue that digital transformation is an organizational change process involving strategy, structure, and human resource capabilities. Institutional leadership, policy support, human resource readiness, and an innovation-oriented culture play a critical role in ensuring successful implementation (Verhoef et al., 2021). Without a clear institutional strategy, digital initiatives often remain fragmented and fail to yield significant improvements in institutional performance.

In response to these challenges, universities are increasingly adopting a holistic approach by developing integrated digital ecosystems. This approach connects technological infrastructure, information systems, learning platforms, and data-driven governance into a coordinated system that supports academic and managerial processes (Alenezi et al., 2023). Integrated digital ecosystems enable institutions to align digital initiatives with institutional goals, thereby strengthening their capacity to improve the quality of education and organizational performance.

Although digital transformation has been widely discussed in previous studies, most research has focused on technology adoption and online learning practices (Benavides et al., 2020; Bond et al., 2021; Martin et al., 2020). Research also highlights the role of digital systems in improving administrative efficiency and access to information (Almarashdeh, 2016; Alemneh, 2023). However, research examining digital transformation as an institutional strategy within the framework of an integrated digital ecosystem that connects infrastructure, governance, learning systems, and human resource capacity remains limited. This gap is particularly evident in the context of Islamic higher education, where research on digital transformation from a strategic and ecosystem perspective remains scarce.

In the context of English education, digital transformation plays a crucial role in supporting language learning processes through interactive and technology-enhanced environments. Digital platforms such as learning management systems, online communication tools, and multimedia resources enable more effective language practice, particularly in developing students' speaking, listening, reading, and writing skills. Furthermore, the integration of digital ecosystems allows English education programs to align instructional strategies, learning resources, and assessment practices to improve overall learning outcomes and academic performance.

2.2. Digital Ecosystem in Higher Education

The concept of a digital ecosystem in higher education refers to an integrated system that connects digital technologies, institutional stakeholders, and academic and managerial processes within a unified

environment (Ifenthaler et al., 2021). A digital ecosystem is not a collection of separate technologies, but rather a coordinated network of interdependent components that function together to support institutional goals. Rojas & Chiappe (2024) define a digital ecosystem as a set of interconnected elements that enable the creation of integrated digital experiences in an educational context. In higher education, this ecosystem encompasses technological infrastructure, academic information systems, digital learning platforms, human resources, and institutional policies that operate in an interconnected and mutually reinforcing manner (Pinto-Llorente & Izquierdo-Álvarez, 2024).

The effectiveness of a digital ecosystem depends on the level of integration among its components. Nguyen & Tuamsuk (2022) emphasize that a digital learning ecosystem facilitates alignment between digital technologies, services, and educational stakeholders to support both the learning process and institutional management. The integration of systems such as learning management systems, academic information systems, digital libraries, and administrative platforms enables institutions to manage academic activities more efficiently and provide more responsive services to students and faculty (Alemneh, 2023; Alotaibi, 2024). When these systems operate in a coordinated manner, they also support data-driven decision-making through the use of learning analytics and institutional data systems.

Beyond technological integration, the digital ecosystem also involves pedagogical and organizational dimensions. The integration of digital technology with pedagogical practices enables a more interactive and collaborative learning environment. Digital-based collaborative learning has been shown to increase student engagement and participation (Bach & Thiel, 2024). Furthermore, digital platforms expand access to learning resources and facilitate broader interactions among faculty, students, and other stakeholders (Kovari, 2025). These findings indicate that the digital ecosystem plays a critical role in shaping the quality of the learning experience.

In the context of English education, a digital ecosystem supports language learning through integrated platforms that facilitate communication, interaction, and access to authentic learning materials. It enables the alignment of digital tools, instructional strategies, and assessment practices to enhance students' language proficiency and overall learning outcomes.

However, developing a digital ecosystem requires more than just technology adoption. It depends on institutional strategies, leadership, and organizational readiness. Gong & Ribiere (2021) argue that successful digital transformation requires alignment between technology systems, human resource capacity, and institutional strategies. Leadership and organizational culture are key factors determining whether digital initiatives can be integrated into a cohesive system. Without strategic coordination, digital technologies tend to remain fragmented and fail to produce optimal institutional outcomes.

From a systemic perspective, a digital ecosystem can be understood as a strategic mechanism that connects various institutional components to enhance performance. The interaction between technological infrastructure, digital learning systems, institutional governance, and human resource readiness enables higher education institutions to improve the quality of learning, enhance administrative efficiency, and strengthen institutional management (Hinings et al., 2018). Therefore, the development of an integrated digital ecosystem is not merely a technological initiative but also an institutional strategy that supports sustainable performance improvement in higher education.

Although important, existing studies often examine the components of the digital ecosystem separately, rather than as an integrated system. Research exploring how these components interact within a single institutional framework and how such interactions contribute to improved institutional performance remains limited. This limitation highlights the need for a more comprehensive analysis of digital ecosystem development that considers both integration and its impact on higher education performance.

2.3. The Role of Digital Transformation in The Context of English Education

Rapid advances in digital technology have brought about significant changes in English language education at the university level. Digital transformation in English language education refers to the integration

of digital technology into learning processes, assessment, and academic services to enhance the effectiveness of language learning. This transformation has transformed traditional teaching practices by creating a more flexible, interactive, and student-centered learning environment (Reinders & Chong, 2023; Lai & Bower, 2020).

Digital technology offers various opportunities to develop students' language skills. Learning Management Systems (LMS), online communication platforms, multimedia learning resources, artificial intelligence applications, and mobile-based learning technologies enable students to gain more authentic language exposure and broader opportunities for interaction outside the classroom (Viberg et al., 2020; Pegrum et al., 2022). These technologies support the development of listening, speaking, reading, and writing skills while fostering students' independence and engagement in the learning process.

The integration of digital technology also drives pedagogical innovation in English language education. Blended learning approaches, online learning, and technology-enhanced language learning allow instructors to combine face-to-face instruction with various digital learning resources and virtual communication media (Stickler et al., 2020). This approach provides students with more opportunities to practice using the language in authentic contexts and enhances their active participation in learning. Therefore, digital transformation has become a key factor in improving the quality of English language teaching and learning.

However, the success of digital transformation in English language education does not depend solely on the use of technology at the classroom level. Its implementation requires institutional support that includes the availability of technological infrastructure, digital learning platforms, institutional policies, as well as the digital competencies of faculty and educational staff (Pegrum et al., 2022; Wei, 2023). Thus, digital transformation must be viewed as part of an institutional strategy that supports sustainable innovation in English language education.

In this context, the concept of a digital ecosystem offers a more comprehensive framework for understanding how digital transformation can support English language education. A digital ecosystem integrates technological infrastructure, learning platforms, governance systems, and human resource capacity into an interconnected environment. This integration enables English language education programs to align teaching practices, learning resources, assessment systems, and institutional support to enhance the quality of education and student learning outcomes.

Although various studies have demonstrated the benefits of digital technology in language learning, most research still focuses on the use of specific tools, platforms, or learning practices (Reinders & Chong, 2023; Viberg et al., 2020; Wei, 2023). Research examining how digital ecosystems function as institutional strategies to support English language education through the integration of infrastructure, governance, learning systems, and human resource readiness remains limited. This gap is even more evident in the context of Islamic universities, where empirical studies on the role of digital ecosystems in supporting English language education are still relatively scarce.

3. RESEARCH METHOD

This study employs a qualitative approach with a case study design to analyze how the development of a digital ecosystem functions as an institutional strategy in strengthening the performance of the English Education program at UIN Syahada Padangsidimpuan. Creswell & Poth (2018) state that a qualitative approach is used to understand phenomena in depth in a specific social context. Case study design is used to analyze contemporary phenomena in complex real-life contexts (Yin, 2018). Therefore, a qualitative case study approach was chosen to gain an in-depth understanding of the phenomenon of digital transformation, including strategies, implementation processes, and the dynamics of digital ecosystem development in higher education.

This research was conducted at UIN Syahada Padangsidimpuan, one of the state Islamic universities in Indonesia that plays an important role in the development of higher education. The institution was selected as the research site because it has developed various digital systems to support learning activities, academic services, and institutional management. These initiatives align with the university's ongoing efforts to enhance

the quality of the English Education program and strengthen English education performance through the development of digital technology.

Although the digital ecosystem at UIN Syahada Padangsidempuan operates at the institutional level and supports various academic and administrative functions across the university, this study specifically focuses on its implementation and contribution to the English Education program. Therefore, the findings should be interpreted within the context of English education rather than as a comprehensive evaluation of digital transformation across all academic programs within the institution.

Data collection in this study was conducted through in-depth interviews, observations, and documentation studies. This study involved several key informants who are part of the development and usage of digital systems within the university setting. The research informant in this study was the rector, the head of the English Education study program, English lecturers, and digital system managers supporting English instruction. In summary, this framework encompasses four key informants systematically selected according to their participation in implementing digital transformation at the institution. The practice of using digital technology in academic activities and institutional services was directly observed. In addition, documentation studies were carried out by reviewing institution-specific documents like digital transformation policy, strategic planning documents, and institutional reports related to the development of information technology.

Students were not included as primary informants because the focus of this study was to examine digital ecosystem development as an institutional strategy. Therefore, purposive sampling was directed toward stakeholders who were directly involved in policy formulation, system management, and the implementation of digital transformation initiatives, including institutional leaders, program administrators, lecturers, and digital system managers. While students represent important users of digital systems, their perspectives were beyond the primary scope of this study and may be explored in future research.

Data analysis in this study was conducted using a thematic analysis approach to systematically identify patterns and meanings in the collected data (Braun & Clarke, 2006). The analysis process involved several stages to ensure accuracy and transparency.

First, all interview data were transcribed verbatim and integrated with observation notes and relevant institutional documents. The researcher conducted an initial comprehensive reading to gain a holistic understanding of the dataset. At this stage, preliminary coding was undertaken by identifying meaningful units related to digital transformation, digital ecosystem development, and the performance of the English Education program. Second, the identified codes were grouped into categories based on their similarities and interconnections. This process allowed the researcher to organize the data into broader analytical patterns, such as institutional strategies, digital system integration, human resource readiness, and the transformation of learning processes.

Third, these categories were then developed into main themes representing the core findings of the research. These themes were structured to address the research questions, particularly concerning digital transformation as an institutional strategy, the components of the digital ecosystem, and its contribution to enhancing the performance of the English Education program. The final stage involved interpretive analysis to examine the relationships among themes and to explain how digital ecosystem development functions as a strategic mechanism in strengthening English education performance. The analysis was conducted iteratively by comparing multiple data sources to ensure the consistency, credibility, and depth of interpretation.

4. RESULT AND ANALYSIS

4.1. RESULT

Based on the results of data analysis derived from interviews and observations, this study identified several major themes related to digital transformation, digital ecosystem development, and the digital ecosystem's contributions to English education performance. A summary of the research findings is presented in Table 1.

Table 1. Summary of Research Findings on Digital Transformation and Digital Ecosystem Development in the English Education Program

Research Aspects	Key Findings
Digital Transformation as an Institutional Strategy in English Education	The findings indicate that digital transformation has been institutionalized as a strategic initiative to enhance the quality of the English Education program at UIN Syahada Padangsidempuan. This transformation is driven by leadership commitment and aligned with institutional objectives. Its implementation involves the integration of academic services, administrative management, and information access through digital systems, including course registration, academic data management, and digital communication platforms. In the context of English language teaching, digital platforms are utilized to organize instructional materials, facilitate interactive learning, assign tasks, and conduct assessments, thereby supporting flexible and technology-enhanced pedagogical practices.
Development of a Digital Ecosystem in the English Education Program	The findings reveal that the digital ecosystem is structured as an integrated system consisting of technological infrastructure, academic information systems, and digital learning platforms that support English language instruction. These components function synergistically to enhance academic, administrative, and managerial processes within the program. System integration serves as the primary mechanism for ensuring operational coordination, efficient data management, and evidence-based decision-making. Moreover, human resource readiness, strengthened through continuous training and capacity-building initiatives, plays a crucial role in sustaining the effectiveness of the digital ecosystem.
Contribution of the Digital Ecosystem to English Education Performance	The findings demonstrate that the implementation of a digital ecosystem supports English education by strengthening learning quality, improving academic services, and enhancing program management within the English Education program. First, they improve the quality of English language learning by expanding access to digital resources and enhancing lecturer, student interaction. Second, they increase the efficiency of academic services through the digitization and integration of administrative processes, resulting in more transparent and accessible services for students. Third, they reinforce program management through systematic data management and data-driven decision-making, thereby improving strategic planning and governance within the English Education program.

4.1.1. Transformation as an Institutional Strategy in English Education

The findings indicate that digital transformation at UIN Syahada Padangsidempuan is implemented as an institutional strategy to enhance the quality of the English Education program. This transformation extends beyond the use of technology in classroom activities and reflects broader strategic efforts to strengthen academic services, program management, and access to information within the English Education unit.

Based on interview data, institutional leadership plays a key role in positioning digital transformation as a strategic priority. The rector emphasized that the development of digital systems is essential for improving the efficiency and effectiveness of academic management. According to the rector, the university has prioritized the development of digital systems to enhance the quality of academic services and facilitate access to information for both lecturers and students. This indicates that digital transformation is intentionally directed toward supporting institutional and program-level objectives rather than being implemented as isolated technological initiatives.

Further observations indicate that this strategy is operationalized through the implementation of integrated digital systems within academic services that directly support the English Education program. These include digital platforms for course registration, academic data management, and the dissemination of academic information. The use of these systems enables faster, more transparent, and accessible administrative processes, thereby improving service quality for English Education students and lecturers.

In the context of English language instruction, digital transformation is implemented through the utilization of digital learning platforms that support the management of course materials, assignments, and assessments. According to the digital system manager supporting English instruction, these platforms facilitate the organization of learning resources and enable lecturers to monitor students' learning activities more effectively. This finding suggests that digital learning platforms enhance both instructional management and learning supervision, thereby supporting the effectiveness of English language teaching and learning processes. The active involvement of digital system managers is therefore essential in ensuring the successful implementation of these digital tools.

From an analytical perspective, these findings demonstrate that digital transformation operates as a coordinated institutional strategy integrating academic services, digital infrastructure, and English language teaching practices. The alignment between leadership vision, system management, and instructional implementation indicates that digital ecosystem development is embedded within institutional practices. This strategic integration contributes to strengthening English education performance by enhancing instructional effectiveness and improving program-level academic management.

4.1.2. Development of a Digital Ecosystem in the English Education Program

The findings indicate that the development of the digital ecosystem at UIN Syahada Padangsidimpuan is shaped by several interrelated components that support both academic and managerial functions within the English Education program. This digital ecosystem is not implemented as a collection of isolated technologies, but rather as an integrated system that connects infrastructure, digital platforms, and program-level academic processes.

Based on the data, three main components form the foundation of the digital ecosystem: technological infrastructure, academic information systems, and digital learning platforms that support English language instruction. These components function collectively to facilitate academic administration, English teaching and learning activities, and program management. Their integration enables the English Education program to operate in a more coordinated and efficient manner.

Interview data revealed that system integration is a key strategy in developing the digital ecosystem at the program level. The Head of the English Education Study Program highlighted the importance of integrating various information systems to create a more efficient academic environment. Through this integration, lecturers and students can access academic information more easily, while learning activities and administrative services can be managed more effectively. These findings suggest that digital system integration contributes to the development of a coordinated digital ecosystem that supports both academic management and English language learning processes.

Observational findings support this statement, showing that essential academic services, including student data management, course administration, and academic information services, have been integrated into online digital systems accessible to members of the English Education program. This integration enables systematic data management and supports evidence-based decision-making at the program level. These findings indicate that system integration is a critical mechanism enabling the digital ecosystem to function effectively in strengthening English education performance.

Beyond technological components, the development of the digital ecosystem is also influenced by institutional factors, particularly human resource readiness within the English Education program. Findings indicate that lecturers and administrative staff have participated in training programs to enhance their digital competencies in utilizing learning platforms and academic information systems. This suggests that the effectiveness of the digital ecosystem depends not only on technological availability but also on users' digital literacy and capacity.

From an analytical perspective, the interaction between technological infrastructure, integrated systems, and human resource readiness constitutes the core structure of the digital ecosystem within the English Education program. These components are interdependent, such that the absence of one element may reduce the overall effectiveness of the system. Therefore, digital ecosystem development can be understood as a

coordinated institutional strategy integrating technology, human capacity, and organizational processes to strengthen English education performance.

4.1.3. Contribution of the Digital Ecosystem to English Education Performance

The findings indicate that digital transformation and the development of a digital ecosystem contribute significantly to supporting English education at UIN Syahada Padangsidimpuan. This contribution is reflected in three main areas: improving the quality of English language learning, enhancing the efficiency of academic services within the English Education program, and strengthening program-level management.

First, the digital ecosystem enhances the quality of English language learning by expanding access to digital learning resources and facilitating interaction between lecturers and students. Interview data indicate that digital technology enables broader access to authentic English materials and supports more interactive and student-centered learning practices. In the English Education program, lecturers and students utilize various digital platforms, including the university's Academic Information System (SIKAD), Google Classroom, Google Meet, Zoom, and digital library services. These platforms provide access to learning materials, academic information, online discussions, assignments, assessments, and digital references, while also facilitating synchronous and asynchronous communication between lecturers and students. The integration of these digital tools enables more flexible learning opportunities and promotes greater student engagement in English language learning.

An English lecturer reported that digital technology has facilitated access to a broader range of learning resources and improved interaction between lecturers and students in English classes. This indicates that the integration of digital tools supports both resource availability and active engagement in the learning process.

These findings suggest that digital learning platforms function as strategic tools for improving accessibility, engagement, and instructional effectiveness in English language teaching. Broader access to resources allows students to participate more actively in developing their listening, speaking, reading, and writing skills, thereby contributing to improved learning outcomes.

Second, the digital ecosystem enhances the efficiency of academic services within the English Education program through the digitization and integration of administrative processes. Observational data show that services such as course registration, academic data management, and academic information dissemination have transitioned from manual to integrated digital systems. This shift reduces processing time, increases transparency, and improves accessibility for English Education students and lecturers. These improvements demonstrate that digital systems play a critical role in strengthening program-level academic services.

Third, the development of the digital ecosystem reinforces program management by enabling systematic data management and supporting evidence-based decision-making within the English Education unit. Observation data revealed that the university's Academic Information System (SIKAD) provides access to various academic records, including student enrollment data, course registration information, attendance reports, grade records, and lecturer workload data. These digital records enable program administrators to monitor academic performance, evaluate learning implementation, and support planning and quality assurance activities. The availability of accurate and up-to-date information allows program leaders to make more informed decisions regarding curriculum implementation, course scheduling, and academic services. This finding indicates that digital transformation contributes not only to instructional effectiveness but also to strategic program governance.

From an analytical perspective, these findings reveal that the contribution of the digital ecosystem to English education performance is mediated by the interaction between technological infrastructure, lecturer engagement, and organizational processes. The integration of digital platforms simultaneously supports English language instruction, academic administration, and program management. These interconnected processes create a more efficient, responsive, and adaptive learning environment within the English Education program.

Overall, these findings suggest that digital transformation and digital ecosystem development function as key mechanisms in supporting English education at UIN Syahada Padangsidimpuan. The alignment between digital technology, academic processes, and lecturer and student engagement enables the English Education program to improve learning quality, enhance service efficiency, and strengthen program governance. These findings demonstrate that an integrated digital ecosystem plays an important role in creating a more effective, responsive, and sustainable English education environment. Based on these findings, Figure 1 presents the relationship between digital transformation, digital ecosystem development, and their contribution to English education at UIN Syahada Padangsidimpuan.

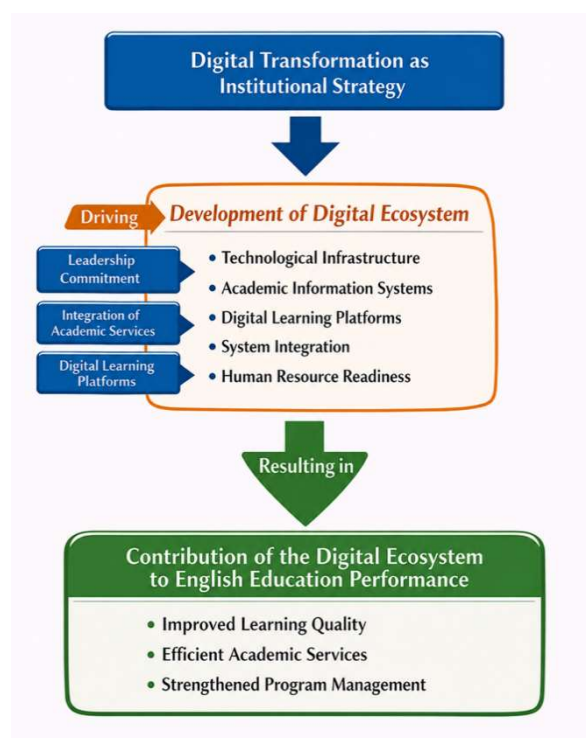


Figure 1. Digital Transformation and Ecosystem Model for Institutional Performance

4.2. ANALYSIS

The findings of this study indicate that digital transformation at UIN Syahada Padangsidimpuan functions as an institutional strategy to strengthen English education performance. The results demonstrate that digital transformation extends beyond the mere application of technology in English language classrooms and encompasses broader changes in academic management systems and program-level services. These findings confirm previous research highlighting the role of digital transformation in improving learning quality and efficiency (Benavides et al., 2020). However, this study provides more specific insights by showing that digital transformation is more effective when strategically embedded in institutional and program practices, rather than implemented as isolated technological initiatives.

Regarding digital ecosystem development, this study identifies that the integration of technological infrastructure, academic information systems, and digital learning platforms constitutes the core structure supporting transformation within the English Education program. These findings support the argument of Gong & Ribiere (2021), who emphasize that digital transformation requires alignment between technology, organizational processes, and institutional strategies. This study extends that perspective by demonstrating that such alignment operates through a digital ecosystem framework, in which interconnected systems facilitate coordinated English language instruction, academic administration, and program management. This suggests that the effectiveness of digital transformation depends largely on the level of system integration within the program.

Furthermore, the findings highlight human resource readiness as a critical factor in developing a sustainable digital ecosystem. The ability of English lecturers, administrative staff, and program leaders to effectively utilize digital systems determines the extent to which the ecosystem functions optimally. These results align with Bond et al. (2021), who argue that digital competencies are central to successful technology integration in higher education. However, this study adds that human resource readiness is not merely a supporting factor but a core component that interacts dynamically with technological systems and organizational processes within the English Education program. This indicates that strengthening English education performance requires the simultaneous development of technological capacity and digital competencies among educators.

In terms of performance outcomes, the integration of digital transformation and digital ecosystem development contributes to improved quality of English language learning, enhanced efficiency of academic services, and strengthened program-level governance. These findings are consistent with prior research emphasizing the positive impact of digital technology on learning effectiveness and administrative services (Al-Fraihat et al., 2020). Nevertheless, this study offers a more comprehensive explanation by identifying the mechanisms underlying these improvements. The integration of digital systems expands access to authentic English learning resources, enhances lecturer–student interaction, streamlines academic services through automation, and supports evidence-based decision-making within the program. These interconnected processes demonstrate that performance enhancement results not from isolated technologies but from a systematically integrated digital ecosystem.

This research contributes to the literature in two primary ways. First, it offers an integrated analytical framework linking digital transformation, digital ecosystem development, and English education performance within a unified institutional strategy perspective. While previous studies have often examined these dimensions separately, this research demonstrates how they interact systematically within the context of an English Education program. Second, it provides empirical evidence from a state Islamic university context, which remains underrepresented in existing scholarship. The findings show that digital ecosystem development can function as a strategic mechanism for strengthening English education performance, particularly in the context of developing countries.

From a practical standpoint, this study suggests that universities seeking to enhance English education performance should adopt an integrated approach to digital transformation. The development of digital technologies must align with program strategies, be supported by strong system integration, and be accompanied by continuous development of lecturers' digital competencies. Institutions that focus solely on technological adoption without integrating organizational processes and human resource capacity may encounter limitations in achieving sustainable improvements. Therefore, a comprehensive digital ecosystem approach is essential for improving the quality of English language learning, increasing service efficiency, and strengthening program competitiveness in the digital era.

5. CONCLUSION

This study examines how digital ecosystem development functions as a strategic mechanism to support English education at UIN Syahada Padangsidiempuan. The findings indicate that digital transformation is implemented as both a program-level and institutional strategy that extends beyond the use of technology in English language instruction. It involves the integration of academic services, program management, and digital systems to enhance the effectiveness and efficiency of educational processes within the English Education program.

The study identifies several interconnected components that shape digital ecosystem development, including technological infrastructure, digital learning platforms, academic information systems, and human resource readiness. These components operate as a coordinated system that supports instructional, administrative, and managerial activities. The findings further reveal that the digital ecosystem contributes to English education through three primary mechanisms: improving the quality of English language learning by expanding access to digital resources and strengthening lecturer-student interaction, enhancing the efficiency

and transparency of academic services through integrated digital systems, and supporting program management through systematic data management and evidence-based decision-making.

The findings also suggest that the benefits of digital transformation are most evident when technological initiatives are integrated with organizational processes and supported by institutional commitment. This study demonstrates that digital ecosystem development provides a practical framework for aligning digital technologies, academic services, and program management within a unified strategy to support English education. In doing so, it extends existing discussions on digital transformation by highlighting the importance of an ecosystem perspective in understanding how digital technologies contribute to educational development within the context of Islamic higher education.

From a practical perspective, the findings emphasize the importance of aligning digital technologies with program objectives, strengthening system integration, and continuously developing lecturers' digital competencies. Such efforts can help English Education programs improve learning quality, enhance service delivery, and strengthen their capacity to respond to the demands of an increasingly digital educational environment.

This study is limited to a single institutional context and focuses specifically on the English Education program at UIN Syahada Padangsidempuan. Consequently, the findings may not fully represent the implementation of digital ecosystems in other higher education settings. Future research may explore digital ecosystem development across multiple institutions and incorporate students' perspectives to provide a more comprehensive understanding of how digital transformation supports English education in different contexts.

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