Sharia Economic and Management Business Journal (SEMBJ)

| Volume 7, Issue 3, 2026 | Page 182-199 |
https://doi.org/10.62159/sembj.v7i3.2738
ISSN-Online: 2774-2679
This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License © 2026 by author/s.
https://siducat.org/index.php/sembj

The Role of Adaptive Innovation in Sustainable Competitiveness: Evidence from Private Higher Education Institutions' Response to Digital Disruption on Student Retention and Institutional Reputation

Yenny Marthalena*, M. Yusuf S. Barusman, Andala R.P. Barusman, Defrizal, Sunarmi, Yuni Astini

Bandar Lampung University, Indonesia.

Yennymarthalena232102013@student.ubl.ac.id *✉

ARTICLE INFO

Keywords:
Digital Disruption; Dynamic Capabilities; Organizational Ambidexterity; Adaptive Innovation; Student Retention; Institutional Reputation; Sustainable Competitive Advantage;

ABSTRACT

Background: Private higher education institutions face increasing pressure from digital disruption, competition, and changing stakeholder expectations. However, digital transformation does not automatically lead to innovation outcomes. This study examines the roles of digital disruption, dynamic capabilities, and organizational ambidexterity in developing adaptive innovation and its impact on student retention, institutional reputation, and sustainable competitive advantage.
Research Gap: Previous studies have largely focused on technology adoption, digital learning platforms, and technological readiness, providing limited explanation of how digital disruption is transformed into adaptive innovation and institutional outcomes. The organizational mechanisms underlying adaptive innovation remain insufficiently integrated, with dynamic capabilities and organizational ambidexterity often examined separately rather than as interconnected capability mechanisms.
Novelty: This study develops an integrated framework linking digital disruption, dynamic capabilities, and organizational ambidexterity with adaptive innovation, and examines how adaptive innovation contributes to student retention, institutional reputation, and sustainable competitive advantage in private higher education institutions, extending Dynamic Capabilities Theory into the higher education context.
Method: A quantitative explanatory design using a cross-sectional survey was employed. Data were collected from 316 academic and managerial respondents across 77 private higher education institutions in the LLDIKTI Region II area of Indonesia. The proposed model was analyzed using Partial Least Squares Structural Equation Modeling with SmartPLS 4.0, including measurement model assessment, structural model evaluation, effect size analysis, and predictive assessment.
Results: The findings show that dynamic capabilities strongly influence adaptive innovation ($\beta=0.802$, $p<0.001$), followed by organizational ambidexterity ($\beta=0.241$, $p<0.001$). Adaptive innovation positively affects student retention ($\beta=0.741$, $p<0.001$) and institutional reputation ($\beta=0.916$, $p<0.001$), while institutional reputation enhances sustainable competitive advantage ($\beta=0.744$, $p<0.001$). Digital disruption does not significantly influence adaptive innovation ($\beta=-0.036$, $p=0.054$), indicating that technology pressure alone is insufficient to generate innovation without organizational capabilities. The model explains 93.3% of the variance in adaptive innovation.
Conclusion: Adaptive innovation in private higher education institutions is primarily capability-driven rather than technology-driven. The study extends Dynamic Capabilities Theory by demonstrating that organizational capabilities are essential for

transforming digital challenges into innovation outcomes and sustainable competitiveness.

Received: 7/13/2026 **Revised:** 9/24/2026 **Accepted:** 9/29/2026 **Published:** 9/29/2026

How to cite this article:
Marthalena, Y., Barusman, M.Y.S., Defrizal, Sumarni, Astini, Y. (2026). The Role of Adaptive Innovation in Sustainable Competitiveness: Evidence from Private Higher Education Institutions' Response to Digital Disruption on Student Retention and Institutional Reputation. Sharia Economic and Management Business Journal (SEMBJ), 6(3), 182-199. https://doi.org/10.62159/sembj.v7i3.2738

INTRODUCTION

Digital technologies have fundamentally changed the environment in which higher education institutions (HEIs) operate. Technologies such as artificial intelligence, big data analytics, cloud computing, learning management systems, and digital platforms are reshaping educational delivery, institutional processes, stakeholder engagement, and value creation (Surjawan et al., 2025; Verhoef et al., 2021). However, digital transformation extends beyond technology adoption; it requires organizational capabilities that enable institutions to recognize changes, respond to opportunities, and renew their resources and processes (Teece, 2007; Warner & Wäger, 2019).

Higher education institutions face increasing pressure from changing student expectations, flexible learning demands, digital service requirements, and intensified competition among providers. These changes are particularly challenging for private higher education institutions (PHEIs), which must simultaneously maintain academic quality, attract and retain students, ensure financial sustainability, and differentiate themselves in competitive markets (Benavides et al., 2020; McLean, 2025). Therefore, digital disruption represents not merely a technological challenge but a strategic challenge requiring institutional adaptation.

Responding to digital disruption requires PHEIs to move beyond technology adoption toward adaptive innovation. Adaptive innovation refers to the ability of institutions to develop, implement, modify, and continuously improve solutions in response to changing environmental conditions (Abukalusa & Oosthuizen, 2025). In higher education, adaptive innovation includes redesigning learning models, improving digital academic services, developing flexible programs, and enhancing organizational practices. Through adaptive innovation, institutions can transform environmental pressures into new forms of value creation and institutional resilience (Mousa & Bouraoui, 2026).

However, digital disruption alone does not guarantee adaptive innovation. Institutions facing similar technological changes may demonstrate different innovation outcomes because their organizational capabilities differ. Dynamic capabilities provide an important explanation for this variation by emphasizing the ability to sense environmental changes, seize opportunities, and transform resources and processes (Teece, 2007). In PHEIs, these capabilities enable institutions to interpret technological developments, respond to student needs, allocate resources strategically, and redesign academic and administrative processes.

At the same time, innovation requires institutions to balance the pursuit of new opportunities with the improvement of existing capabilities. This challenge reflects organizational ambidexterity, which refers to the ability to simultaneously pursue exploration and exploitation (Raisch et al., 2009; O'Reilly & Tushman, 2013). Universities must explore new educational models, technologies, and partnerships while maintaining academic quality, operational efficiency, and institutional stability. Recent research highlights that dynamic capabilities and ambidextrous practices are complementary mechanisms for improving organizational responsiveness and innovation outcomes (Johnston et al., 2025; Ng & Ahmed, 2025).

The importance of adaptive innovation is further reflected in its institutional outcomes. Student retention is a critical strategic outcome for PHEIs because continued student participation supports academic continuity, institutional stability, and long-term stakeholder relationships. Student retention is

influenced by academic experience, learning flexibility, institutional support, service responsiveness, and perceived institutional value (Forid et al., 2022; Nkomo et al., 2021). Similarly, adaptive innovation may strengthen institutional reputation by improving perceptions of academic quality, credibility, responsiveness, and institutional distinctiveness among stakeholders (Del-Castillo-Feito et al., 2022; Fernández-Gubieda & Gutiérrez-García, 2025).

Institutional reputation represents an important intangible resource that may contribute to sustainable competitive advantage. From the Resource-Based View (RBV), valuable and difficult-to-imitate resources become sources of sustained advantage when they are embedded within organizational capabilities (Barney, 1991; Miotto et al., 2020). For PHEIs, reputation accumulated through stakeholder experiences, institutional performance, and perceived credibility can strengthen differentiation, trust, and long-term competitiveness (Del-Castillo-Feito et al., 2022).

Despite increasing research on digital transformation and innovation in higher education, several gaps remain. First, previous studies have largely focused on technology adoption, digital learning platforms, digital maturity, and technological readiness, providing limited explanation of how digital disruption is transformed into adaptive innovation and institutional outcomes (Benavides et al., 2020; Verhoef et al., 2021; Molina-Carmona et al., 2023). The challenge is particularly relevant for PHEIs, where technological change must be aligned with organizational resources, student expectations, institutional identity, and competitive pressures.

Second, the organizational mechanisms underlying adaptive innovation remain insufficiently integrated. Dynamic capabilities explain how organizations sense, seize, and transform resources, whereas organizational ambidexterity explains how organizations balance exploration and exploitation. However, these perspectives are often examined separately rather than as interconnected capability mechanisms. Therefore, an integrated capability perspective is needed to explain how PHEIs transform environmental changes into adaptive innovation.

Third, previous studies have insufficiently connected adaptive innovation with multiple institutional outcomes. Student retention and institutional reputation represent complementary dimensions of institutional performance, reflecting both student-level sustainability and broader stakeholder evaluation. Understanding these relationships provides a more comprehensive explanation of how innovation capability creates value for PHEIs.

Fourth, although reputation is widely recognized as an institutional asset, its role as a strategic pathway toward sustainable competitive advantage remains insufficiently integrated into digital and organizational adaptation models. This issue is particularly important for PHEIs because intangible assets such as reputation, knowledge, and innovation capability are difficult for competitors to replicate.

To address these gaps, this study develops an integrated framework linking digital disruption, dynamic capabilities, and organizational ambidexterity with adaptive innovation, and examines how adaptive innovation contributes to student retention and institutional reputation, while institutional reputation contributes to sustainable competitive advantage. The study draws on Dynamic Capabilities Theory as the primary perspective, complemented by RBV and Organizational Ambidexterity Theory. RBV explains the strategic value of institutional resources, dynamic capabilities explain resource transformation under changing environments, and ambidexterity explains the balance between exploration and exploitation.

This study contributes to strategic management and higher education research by explaining how PHEIs can move beyond technology adoption toward capability-driven adaptive innovation and sustainable competitiveness. Accordingly, this study addresses the following research question:

How do digital disruption, dynamic capabilities, and organizational ambidexterity influence adaptive innovation, and how does adaptive innovation contribute to student retention, institutional reputation, and sustainable competitive advantage in private higher education institutions?

Accordingly, this study aims to empirically examine how digital disruption, dynamic capabilities, and organizational ambidexterity influence adaptive innovation, and how adaptive innovation contributes to student retention, institutional reputation, and sustainable competitive advantage in private higher education institutions (PHEIs). By integrating these constructs into a unified framework, this study extends strategic management and higher education research by explaining how PHEIs can

move beyond technology adoption toward capability-driven adaptive innovation and sustainable institutional competitiveness.

Adaptive Innovation

Adaptive innovation refers to an institution's ability to develop, implement, and continuously adjust new or improved solutions in response to changes in its environment. It emphasizes experimentation, learning, implementation, and continuous adjustment rather than innovation as a one-time activity (Lawson & Samson, 2001; Teece, 2007). In higher education, adaptive innovation may involve changes in curricula, teaching and learning methods, digital services, student support, administrative processes, and organizational practices (Benavides et al., 2020; Alenezi, 2023).

In this study, adaptive innovation is understood as the institution's capacity to recognize the need for change, experiment with new approaches, implement appropriate innovations, and refine them based on feedback and changing conditions. This definition emphasizes the institution's ability to translate environmental changes into practical and sustainable improvements (Lawson & Samson, 2001; Mousa & Bouraoui, 2026).

Digital Disruption in Higher Education

Digital disruption refers to technology-driven changes that transform organizational practices, value creation processes, and competitive dynamics. In higher education, technologies such as artificial intelligence, digital platforms, data analytics, cloud computing, and online learning systems are reshaping educational delivery, student interaction, and institutional operations (Vial, 2019; Verhoef et al., 2021).

For private higher education institutions (PHEIs), digital disruption creates both opportunities and challenges by changing student expectations, increasing competition, and requiring new approaches to academic and administrative services. Therefore, digital disruption represents broader environmental changes rather than merely technology adoption (Benavides et al., 2020; Alenezi, 2023).

In this study, digital disruption is conceptualized as external pressure arising from changes in digital technology, student expectations, educational delivery models, and competitive conditions that require institutional adaptation. The ability to transform these pressures into innovation outcomes depends on organizational capabilities (Vial, 2019; Teece, 2007).

Resource-Based View and Strategic Resources

The Resource-Based View (RBV) explains that sustainable competitive advantage originates from organizational resources that are valuable, rare, difficult to imitate, and non-substitutable (Barney, 1991). In higher education, strategic resources include faculty expertise, institutional knowledge, leadership capability, organizational culture, digital infrastructure, intellectual capital, academic reputation, and stakeholder relationships (Barney, 1991; Lynch & Baines, 2004).

However, resources alone may not generate sustainable value in rapidly changing environments. Their strategic impact depends on the institution's ability to develop, integrate, and reconfigure resources in response to environmental changes (Teece et al., 1997; Teece, 2007). Therefore, this study positions RBV as the theoretical foundation explaining the importance of institutional resources, while dynamic capabilities explain how these resources are transformed into adaptive innovation and sustainable competitive advantage.

Dynamic Capabilities

Dynamic capabilities refer to an organization's ability to adapt, renew, and reconfigure its resources and processes in response to environmental changes (Teece et al., 1997; Teece, 2007). They consist of three interrelated processes: sensing, which involves identifying changes, opportunities, and threats; seizing, which refers to mobilizing resources and implementing strategic responses; and transforming, which involves reconfiguring resources, structures, and processes to sustain competitiveness (Teece, 2007).

In private higher education institutions (PHEIs), dynamic capabilities enable institutions to recognize technological developments, anticipate changing student needs, allocate resources to emerging opportunities, and redesign academic and organizational processes. These capabilities are increasingly

relevant as universities face digital disruption, competitive pressure, and evolving stakeholder expectations (Wang & Ahmed, 2007; Teece, 2007).

Accordingly, this study conceptualizes dynamic capabilities as institutional capabilities reflected through sensing, seizing, and transforming processes that enable PHEIs to convert environmental changes into adaptive innovation and sustainable competitive advantage (Teece, 2007; Wang & Ahmed, 2007)

Organizational Ambidexterity

Organizational ambidexterity refers to an organization's ability to simultaneously pursue exploration and exploitation to achieve adaptability and sustained performance (Raisch et al., 2009; O'Reilly & Tushman, 2013). Exploration focuses on developing new knowledge, technologies, programs, and opportunities, whereas exploitation emphasizes improving existing resources, processes, and capabilities (Kassotaki, 2022).

In private higher education institutions (PHEIs), ambidexterity is essential because institutions must explore new educational models, digital innovations, and emerging opportunities while continuously improving academic quality, operational efficiency, and existing programs. Recent studies on university ambidexterity highlight that higher education institutions need to balance knowledge exploration and exploitation to sustain innovation and institutional performance (Lissillour & Rodriguez-Escobar, 2023; Johnston et al., 2025).

In this study, organizational ambidexterity is conceptualized as the institutional capability to balance exploration and exploitation in developing adaptive innovation and responding to changing environmental demands (Martínez-Román et al., 2025).

Student Retention

Student retention refers to students' ability and intention to continue their educational journey until program completion. It reflects not only enrollment continuity but also students' academic experiences, engagement, satisfaction, institutional support, and perceived value of the institution (Tinto, 1993; Tinto, 2025).

For private higher education institutions (PHEIs), student retention is a strategic indicator of institutional sustainability because maintaining student continuity contributes to academic stability, financial sustainability, and institutional performance. Previous studies highlight that student satisfaction, institutional reputation, service quality, and student–institution relationships influence students' decisions to remain enrolled (Al Hassani & Wilkins, 2022; Forid et al., 2022).

In this study, student retention is conceptualized as students' intention to continue their studies, commitment to remain enrolled, and likelihood of completing their educational programs at the institution (Tinto, 1993; Al Hassani & Wilkins, 2022)..

Institutional Reputation

Institutional reputation represents the collective perceptions of stakeholders regarding an institution's quality, credibility, performance, and distinctiveness (Fombrun, 1996). In higher education, reputation reflects stakeholder evaluations of academic quality, service quality, innovation capability, governance effectiveness, institutional credibility, and responsiveness to stakeholder expectations (Fombrun, 1996; Del-Castillo-Feito et al., 2022).

For private higher education institutions (PHEIs), institutional reputation is a strategic intangible asset because it influences stakeholder trust, institutional attractiveness, student decisions, and competitive positioning. A strong reputation develops through consistent institutional performance, positive stakeholder experiences, and the ability to deliver value beyond competitors (Fombrun, 1996; Sung & Yang, 2008).

In this study, institutional reputation is conceptualized as stakeholders' perceptions of academic quality, service quality, innovation, responsiveness, credibility, and institutional distinctiveness that contribute to sustainable competitive advantage (Fombrun, 1996; Del-Castillo-Feito et al., 2022)

Sustainable Competitive Advantage

Sustainable competitive advantage refers to an institution's ability to maintain a distinctive and superior strategic position over time through resources and capabilities that are valuable, rare, difficult to imitate, and difficult to substitute (Barney, 1991). In higher education, competitive advantage increasingly depends on intangible resources, including academic quality, institutional reputation, innovation capability, knowledge, stakeholder relationships, and organizational legitimacy (Barney, 1991; Lynch & Baines, 2004).

For private higher education institutions (PHEIs), institutional reputation represents an important strategic asset because it is accumulated through continuous stakeholder experiences and is difficult for competitors to replicate. Strong reputation, combined with innovation capability and organizational resources, enables institutions to strengthen differentiation, stakeholder trust, and long-term competitiveness (Fombrun, 1996; Del-Castillo-Feito et al., 2022).

In this study, sustainable competitive advantage is conceptualized as the institution's ability to maintain distinctiveness, stakeholder attractiveness, superior value creation, and competitive positioning over time through strategic resources and adaptive capabilities (Barney, 1991; Teece, 2007)..

Theoretical Integration

The literature provides a complementary theoretical foundation for the proposed model. RBV explains the importance of strategic institutional resources, Dynamic Capabilities Theory explains how resources are sensed, seized, and transformed in response to environmental change, and Organizational Ambidexterity Theory explains how institutions balance exploration and exploitation.

Within this framework, adaptive innovation functions as the central mechanism through which environmental disruption and organizational capabilities are translated into institutional responses. Adaptive innovation is subsequently expected to generate student and institutional value through improved student retention and institutional reputation, while reputation may contribute to sustainable competitive advantage. Thus, the proposed model integrates the following strategic logic:

Digital Disruption + Dynamic Capabilities + Organizational Ambidexterity → Adaptive Innovation → Student Retention / Institutional Reputation → Sustainable Competitive Advantage.

Digital Disruption and Adaptive Innovation

Digital disruption alters technologies, student expectations, educational delivery, and competitive conditions, requiring PHEIs to adjust established practices. Such changes can stimulate experimentation, implementation of new approaches, and continuous improvement in academic and administrative services. Recent higher education research confirms that technological change creates new opportunities for universities to develop flexible educational offerings and reconfigure organizational resources. Therefore, greater exposure to digital disruption is expected to encourage adaptive innovation.

H1: Digital disruption positively influences adaptive innovation in private higher education institutions.

Dynamic Capabilities and Adaptive Innovation

Dynamic capabilities enable PHEIs to sense environmental changes, seize emerging opportunities, and transform resources and processes. These capabilities allow universities to translate changes in technology, student needs, and competition into appropriate organizational responses. Empirical studies in higher education show that dynamic capabilities support innovation and resource reconfiguration in response to changing demands. Hence, stronger dynamic capabilities are expected to enhance adaptive innovation.

H2: Dynamic capabilities positively influence adaptive innovation in private higher education institutions.

Organizational Ambidexterity and Adaptive Innovation

Organizational ambidexterity enables PHEIs to simultaneously pursue exploration of new opportunities and exploitation of existing resources and processes. This balance allows institutions to experiment with new academic, technological, and service approaches while maintaining quality and operational continuity. Research on university ambidexterity confirms the persistent interaction between

exploration and exploitation in higher education activities. Therefore, greater organizational ambidexterity is expected to strengthen adaptive innovation.

H3: Organizational ambidexterity positively influences adaptive innovation in private higher education institutions.

Adaptive Innovation and Student Retention

Adaptive innovation enables PHEIs to continuously improve learning methods, academic services, digital access, and student support in response to changing needs. These improvements can increase perceived relevance, value, and quality of the student experience, thereby encouraging students to continue their studies. Accordingly, institutions with stronger adaptive innovation are expected to achieve higher student retention.

H4: Adaptive innovation positively influences student retention in private higher education institutions.

Adaptive Innovation and Institutional Reputation

Adaptive innovation can improve institutional reputation by demonstrating responsiveness, relevance, service quality, and the ability to address changing stakeholder expectations. When innovations generate visible improvements in academic programs, learning experiences, and institutional services, they can strengthen stakeholders' perceptions of institutional quality and distinctiveness. Therefore, stronger adaptive innovation is expected to enhance institutional reputation.

H5: Adaptive innovation positively influences institutional reputation in private higher education institutions.

Institutional Reputation and Sustainable Competitive Advantage

Institutional reputation is an intangible strategic resource that can strengthen trust, stakeholder preference, differentiation, and institutional attractiveness. Consistent with the Resource-Based View, reputation can contribute to competitive advantage when it is valuable and difficult for competitors to replicate. Empirical research also links institutional reputation and intangible resources with university competitiveness. Therefore, stronger institutional reputation is expected to enhance sustainable competitive advantage.

H6: Institutional reputation positively influences sustainable competitive advantage in private higher education institutions.

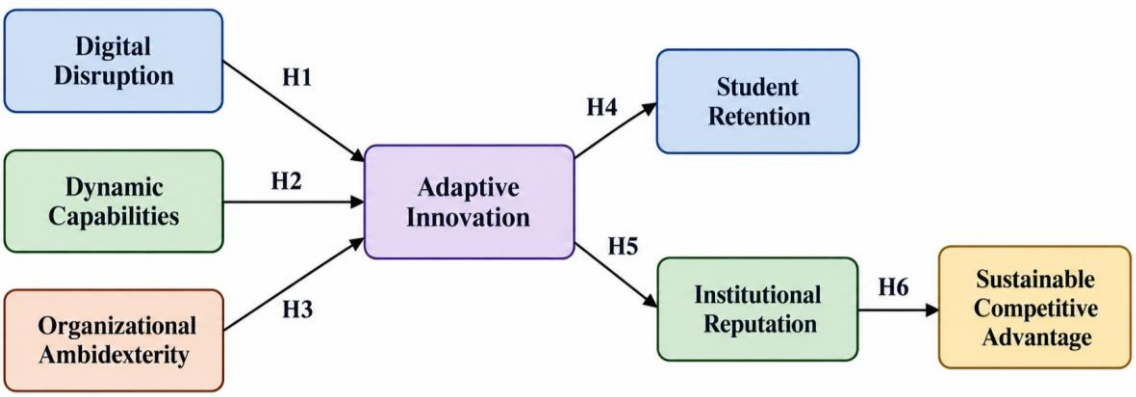


Figure 1. Research Framework

METHOD

Research Design

This study employed a quantitative, cross-sectional explanatory design to test the hypothesized relationships among digital disruption, dynamic capabilities, organizational ambidexterity, adaptive innovation, student retention, institutional reputation, and sustainable competitive advantage in private higher education institutions (PHEIs). The design was appropriate for examining theory-based

relationships among measurable latent constructs using survey data collected at a single point in time. The research model was grounded in the Resource-Based View, Dynamic Capabilities Theory, and Organizational Ambidexterity Theory, with adaptive innovation positioned as the central mechanism linking environmental disruption and organizational capabilities to institutional outcomes. The structural relationships were examined according to hypotheses H1–H6 and are interpreted as directional associations rather than definitive causal effects, given the cross-sectional nature of the data.

Population and Sample

The study population comprised 166 private higher education institutions (PHEIs) within the LLDIKTI Region II population frame. All institutions were invited to participate, and 77 PHEIs provided valid responses, consisting of universities, colleges, polytechnics, academies, and institutes. Data were collected from 316 respondents occupying strategic academic and managerial positions, including rectors/vice rectors, deans/vice deans, heads of study programs, and heads of strategic units. Respondents were selected based on their involvement in institutional decision-making, academic management, innovation activities, and strategic organizational processes.

Sampling Procedure and Respondent Criteria

All 166 PHEIs in the study population frame were invited to participate. Of these, 77 PHEIs provided valid institutional responses and were included in the analysis. Within each participating institution, respondents were selected from academic and managerial positions directly involved in institutional decision-making, academic management, innovation, or strategic activities. A total of 316 respondents participated, comprising rectors/vice rectors, deans/vice deans, heads of study programs, and heads of strategic units. This multi-level respondent structure was used to obtain informed assessments of institutional capabilities, innovation practices, and strategic outcomes.

Measurement Instruments

The research instrument was developed by adapting and contextualizing validated constructs from previous studies to the PHEI setting. The questionnaire comprised 48 reflective items across seven constructs, measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Digital disruption was measured through technological change and environmental turbulence; dynamic capabilities through sensing, seizing, and transforming; organizational ambidexterity through exploration and exploitation; adaptive innovation through strategic, process, and service innovation; student retention through persistence, satisfaction, and engagement; institutional reputation through stakeholder perception and institutional image; and sustainable competitive advantage through sustainability and differentiation. The measurement model was assessed using outer loadings, Cronbach's alpha, composite reliability, AVE, and HTMT.

Table 1. Operationalization of Variables

Construct Dimensions Items Sources

Construct	Dimensions	Items	Sources
Digital Disruption (DD)	Technological change; Environmental turbulence	6	Vial (2019 Tinto); Verhoef et al. (2021)
Dynamic Capabilities (DC)	Sensing; Seizing; Transforming	9	Teece (2007); Kump et al. (2019)
Organizational Ambidexterity (OA)	Exploration; Exploitation	8	O'Reilly & Tushman (2013)
Adaptive Innovation (AI)	Strategic; Process; Service innovation	8	Lawson & Samson (2001)
Student Retention (SR)	Persistence; Satisfaction; Engagement	6	Tinto (1993)
Institutional Reputation (IR)	Stakeholder perception; Institutional image	6	Fombrun (1996)
Sustainable Competitive Advantage (SCA)	Sustainability; Differentiation	6	Barney (1991)
Total		49	

Data Collection Procedure

Data were collected through a structured questionnaire distributed to the 166 PHEIs within the LLDIKTI Region II population frame. After institutional participation, the questionnaire was administered to eligible academic and managerial personnel, including rectors/vice rectors, deans/vice deans, heads of study programs, and heads of strategic units. A total of 316 valid responses from 77 participating PHEIs were obtained and screened for completeness before analysis. Participation was voluntary, and respondents completed the questionnaire using a five-point Likert scale.

Data Analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. The analysis comprised two stages. First, the measurement model was assessed to examine indicator reliability, internal consistency, convergent validity, and discriminant validity using outer loadings, Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and HTMT. Second, the structural model was evaluated using variance inflation factor (VIF), path coefficients (β), coefficient of determination (R^2), and effect size (f^2). Hypotheses H1–H6 were tested through bootstrapping with 10,000 subsamples at a 5% significance level. A hypothesis was supported when the estimated path coefficient was positive and statistically significant, based on the bootstrapped t-value, p-value, and 95% confidence interval.

Ethical Considerations

This research followed social research ethics principles. Respondents were provided information regarding research objectives, identity confidentiality, and data use solely for academic purposes. Participation was voluntary with respondent consent.

RESULTS

Respondent Profile

A total of 316 valid responses were obtained from 77 participating private higher education institutions (PHEIs) in the LLDIKTI Region II. The respondents represented different organizational levels, including strategic leadership, faculty management, academic program management, and institutional support units. This multi-level representation was considered appropriate because the study examined organizational capabilities, innovation practices, and strategic outcomes that require knowledge of institutional processes and decision-making.

Table 2. Respondent Profile

Position	Frequency	Percentage (%)
Rector/Vice Rector	42	13.3
Dean/Vice Dean	64	20.3
Head of Study Program	118	37.3
Head of Strategic Unit	92	29.1
Total	316	100.0

The distribution indicates that most respondents were heads of study programs (37.3%), followed by heads of strategic units (29.1%), deans/vice deans (20.3%), and rectors/vice rectors (13.3%). The composition demonstrates that responses were obtained from both strategic and operational academic levels, providing diverse perspectives on institutional capabilities and innovation-related practices.

Measurement Model Evaluation

The measurement model was evaluated to assess indicator reliability, internal consistency reliability, convergent validity, and discriminant validity of the reflective constructs. Indicator reliability was assessed through outer loadings, while internal consistency was evaluated using Cronbach's alpha and composite reliability (CR). Convergent validity was examined using average variance extracted (AVE), and discriminant validity was assessed using the heterotrait–monotrait ratio (HTMT). Following PLS-SEM guidelines, the results indicate that all constructs achieved satisfactory reliability and validity criteria.

The measurement model consisted of 49 reflective indicators across seven constructs: digital disruption (6 indicators), dynamic capabilities (9 indicators), organizational ambidexterity (8 indicators), adaptive innovation (8 indicators), student retention (6 indicators), institutional reputation (6 indicators), and sustainable competitive advantage (6 indicators).

The results show that Cronbach's Alpha values ranged from 0.884 to 0.921, while Composite Reliability values ranged from 0.916 to 0.945, exceeding the recommended threshold of 0.70. AVE values ranged from 0.687 to 0.742, confirming adequate convergent validity. All retained indicators demonstrated acceptable outer loadings, confirming indicator reliability. Furthermore, HTMT values were below the recommended threshold of 0.90, indicating satisfactory discriminant validity.

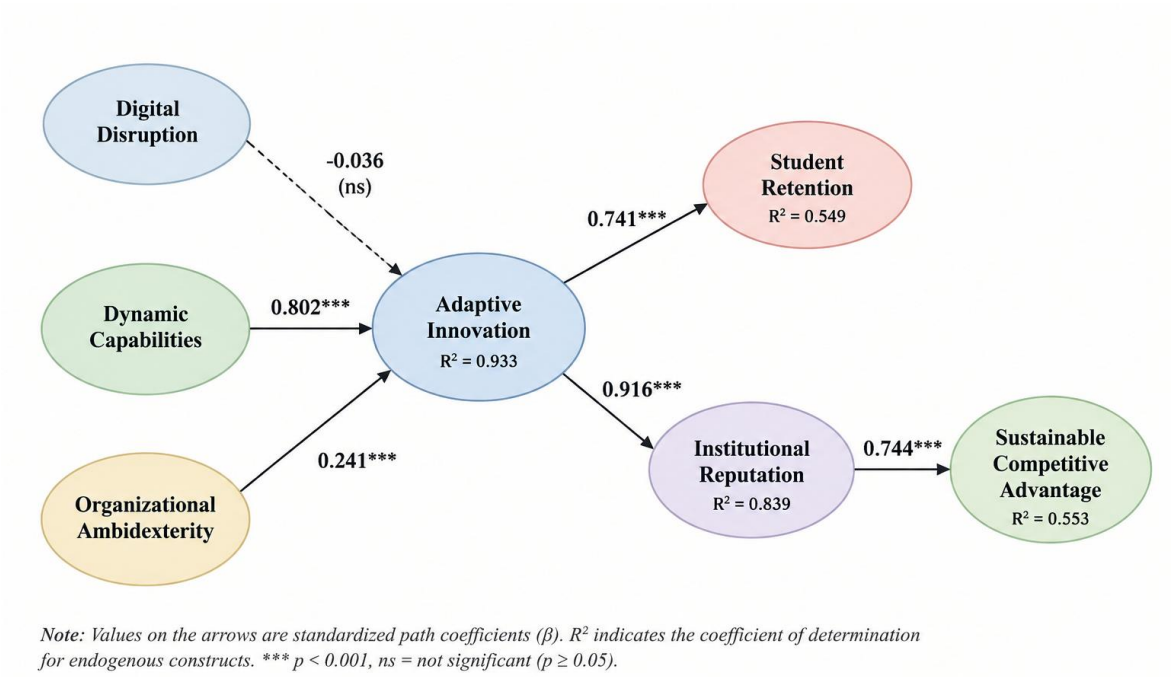
Table 3. Reliability and Convergent Validity Results

Construct	Cronbach's Alpha	Composite Reliability	AVE
Digital Disruption	0.891	0.923	0.701
Dynamic Capabilities	0.914	0.941	0.726
Organizational Ambidexterity	0.887	0.919	0.694
Adaptive Innovation	0.921	0.945	0.742
Student Retention	0.884	0.916	0.687
Institutional Reputation	0.902	0.931	0.708
Sustainable Competitive Advantage	0.895	0.924	0.699

Source: Data processing using SmartPLS 4.0

Structural Model Evaluation and Hypothesis Testing

Following the confirmation of the measurement model, the structural model was evaluated by examining the hypothesized relationships among constructs. The assessment was conducted using the bootstrapping procedure in SmartPLS 4.0 to estimate standardized path coefficients (β), t-values, and p-values. Figure 1 presents the structural model results, including the hypothesized relationships and explained variance (R^2) of endogenous constructs.



*Note: Values on the arrows are standardized path coefficients (β). R^2 indicates the coefficient of determination for endogenous constructs. *** $p < 0.001$, ns = not significant ($p \geq 0.05$).*

Figure 2. Structural Model Results

The structural model results indicate that adaptive innovation serves as a central mechanism linking organizational capabilities with institutional outcomes. Dynamic capabilities demonstrated the strongest positive influence on adaptive innovation (β = 0.802, t = 37.117, p < 0.001), followed by organizational ambidexterity (β = 0.241, t = 9.923, p < 0.001). In contrast, digital disruption did not significantly influence adaptive innovation (β = -0.036, t = 1.935, p = 0.054).

Furthermore, adaptive innovation positively influenced student retention ($\beta = 0.741$, $t = 24.115$, $p < 0.001$) and institutional reputation ($\beta = 0.916$, $t = 80.538$, $p < 0.001$). Institutional reputation also demonstrated a significant positive effect on sustainable competitive advantage ($\beta = 0.744$, $t = 24.695$, $p < 0.001$)

Table 4. Hypothesis Testing Results

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	Digital Disruption → Adaptive Innovation	-0.036	1.935	0.054	Not Supported
H2	Dynamic Capabilities → Adaptive Innovation	0.802	37.117	<0.001	Supported
H3	Organizational Ambidexterity → Adaptive Innovation	0.241	9.923	<0.001	Supported
H4	Adaptive Innovation → Student Retention	0.741	24.115	<0.001	Supported
H5	Adaptive Innovation → Institutional Reputation	0.916	80.538	<0.001	Supported
H6	Institutional Reputation → Sustainable Competitive Advantage	0.744	24.695	<0.001	Supported

Source: Data processing using SmartPLS 4.0

Coefficient of Determination (R^2), Effect Size (f^2), and Predictive Assessment

The explanatory power of the structural model was assessed using the coefficient of determination (R^2), while the effect size (f^2) was evaluated to determine the contribution of each predictor construct to endogenous variables. In addition, predictive capability was assessed using the PLSpredict procedure in SmartPLS 4.0 based on Q^2_predict values and prediction errors.

The results indicate that the proposed model provides strong explanatory power. Adaptive Innovation achieved an R^2 value of 0.933, indicating that Digital Disruption, Dynamic Capabilities, and Organizational Ambidexterity jointly explain 93.3% of its variance. Institutional Reputation obtained an R^2 value of 0.839, while Student Retention and Sustainable Competitive Advantage achieved R^2 values of 0.549 and 0.553, respectively. These findings demonstrate that adaptive innovation functions as a central mechanism linking organizational capabilities with institutional outcomes.

The effect size analysis shows that Dynamic Capabilities had the strongest contribution to Adaptive Innovation ($f^2 = 4.010$), followed by Organizational Ambidexterity ($f^2 = 0.406$). Adaptive Innovation demonstrated substantial effects on Institutional Reputation ($f^2 = 5.209$) and Student Retention ($f^2 = 1.219$), while Institutional Reputation significantly contributed to Sustainable Competitive Advantage ($f^2 = 1.239$). In contrast, Digital Disruption showed a negligible effect on Adaptive Innovation ($f^2 = 0.011$), consistent with the non-significant relationship identified in hypothesis testing.

The predictive assessment using PLSpredict showed that all endogenous construct indicators obtained positive Q^2_predict values, ranging from 0.091 to 0.753, confirming that the model provides predictive relevance for explaining innovation capability and institutional outcomes.

Table 5. Coefficient of Determination (R^2)

Endogenous Construct	R^2	Interpretation
Adaptive Innovation	0.933	Substantial
Institutional Reputation	0.839	Substantial
Student Retention	0.549	Moderate
Sustainable Competitive Advantage	0.553	Moderate

Source: SmartPLS 4.0 output

Table 6. Effect Size (f^2)

Relationship	f^2	Effect Size
Digital Disruption → Adaptive Innovation	0.011	Negligible
Dynamic Capabilities → Adaptive Innovation	4.010	Large
Organizational Ambidexterity → Adaptive Innovation	0.406	Large
Adaptive Innovation → Institutional Reputation	5.209	Large
Adaptive Innovation → Student Retention	1.219	Large

Institutional Reputation → Sustainable Competitive Advantage	1.239	Large

Source: SmartPLS 4.0 output

Table 7. Predictive Assessment (PLS-Predict)

Construct	Indicators	Q^2_predict Range	Predictive Performance
Adaptive Innovation	AI1–AI8	0.390–0.736	Predictive relevance
Institutional Reputation	IR1–IR6	0.443–0.753	Predictive relevance
Student Retention	SR1–SR6	0.322–0.493	Predictive relevance
Sustainable Competitive Advantage	SCA1–SCA6	0.091–0.597	Predictive relevance

Source: SmartPLS 4.0 PLSpredict output

DISCUSSION

Digital Disruption, Dynamic Capabilities, and Adaptive Innovation

This study provides important insights into how private higher education institutions (PHEIs) develop adaptive innovation in response to environmental changes. Contrary to the initial hypothesis, digital disruption did not demonstrate a significant direct influence on adaptive innovation ($\beta = -0.036$, $t = 1.935$, $p = 0.054$). This finding indicates that technological pressure alone does not automatically generate innovation capability within PHEIs.

This result suggests that digital disruption should be understood as an external stimulus rather than a direct source of innovation. The availability of digital technologies, such as artificial intelligence, digital platforms, and data-based systems, creates opportunities for institutional transformation; however, the realization of these opportunities depends on the organization's ability to interpret changes, mobilize resources, and redesign existing processes. Similar arguments have been highlighted in digital transformation research, where technology adoption alone is insufficient without organizational capabilities that enable adaptation and innovation.

In the context of PHEIs, this finding is particularly relevant because universities are complex professional organizations characterized by decentralized decision-making, academic autonomy, and diverse stakeholder interests. Therefore, digital initiatives may not immediately translate into adaptive innovation unless supported by strategic alignment, organizational readiness, and institutional capability development.

The Dominant Role of Dynamic Capabilities in Developing Adaptive Innovation

The strongest finding of this study is the significant influence of dynamic capabilities on adaptive innovation ($\beta = 0.802$, $t = 37.117$, $p < 0.001$; $f^2 = 4.010$). This result confirms that dynamic capabilities represent the primary mechanism through which PHEIs transform environmental challenges into innovation outcomes.

This finding supports Teece's Dynamic Capabilities Theory, which explains that organizations achieve adaptability through three fundamental processes: sensing emerging changes, seizing opportunities, and transforming organizational resources. In the higher education context, dynamic capabilities enable institutions not only to recognize technological and market changes but also to translate these changes into new academic services, learning approaches, governance practices, and institutional strategies.

The very large effect size demonstrates that adaptive innovation in PHEIs is primarily capability-driven rather than technology-driven. This implies that institutions with stronger abilities to reconfigure resources, develop knowledge, and align internal processes are more capable of responding effectively to environmental turbulence. Previous studies similarly emphasize that digital transformation outcomes depend heavily on organizational capabilities that mediate the relationship between technology and innovation performance.

Organizational Ambidexterity as a Supporting Mechanism for Adaptive Innovation

The findings also confirm that organizational ambidexterity positively influences adaptive innovation ($\beta = 0.241$, $t = 9.923$, $p < 0.001$; $f^2 = 0.406$). This indicates that PHEIs require the ability to simultaneously explore new opportunities while exploiting existing capabilities.

In higher education institutions, exploration is reflected through activities such as developing new academic programs, adopting emerging technologies, and experimenting with innovative learning models. Meanwhile, exploitation involves improving existing academic processes, strengthening quality assurance systems, and optimizing current institutional resources.

The positive effect of ambidexterity suggests that adaptive innovation emerges when institutions are able to balance change and continuity. Excessive focus on exploration may create innovation without sustainability, whereas excessive exploitation may result in organizational rigidity. Therefore, ambidextrous capability provides a strategic balance that allows PHEIs to innovate while maintaining operational stability.

Adaptive Innovation as a Strategic Mechanism for Institutional Outcomes

This study demonstrates that adaptive innovation plays a central role in improving institutional outcomes. Adaptive innovation significantly influences student retention ($\beta = 0.741$, $t = 24.115$, $p < 0.001$; $f^2 = 1.219$) and institutional reputation ($\beta = 0.916$, $t = 80.538$, $p < 0.001$; $f^2 = 5.209$).

The strong influence on institutional reputation indicates that innovation capability has become an important strategic asset for PHEIs. Institutions that continuously adapt their academic services, learning systems, and stakeholder engagement mechanisms are more likely to develop positive perceptions among students and external stakeholders.

Furthermore, the relationship between adaptive innovation and student retention demonstrates that innovation is not merely related to technological advancement but also to the institution's ability to understand and respond to student expectations. Flexible learning models, improved academic services, and responsive institutional processes can enhance student satisfaction and strengthen their intention to continue their studies.

Institutional Reputation and Sustainable Competitive Advantage

The final finding shows that institutional reputation significantly influences sustainable competitive advantage ($\beta = 0.744$, $t = 24.695$, $p < 0.001$; $f^2 = 1.239$). This result supports the Resource-Based View (RBV), which positions reputation as an intangible strategic resource that is valuable, difficult to imitate, and capable of generating long-term competitive advantages.

For PHEIs, reputation represents accumulated stakeholder trust regarding academic quality, innovation capability, governance effectiveness, and institutional credibility. Therefore, strengthening reputation through adaptive innovation provides a strategic pathway for maintaining competitiveness in an increasingly competitive higher education environment.

Theoretical and Practical Implications

This study contributes theoretically by extending Dynamic Capabilities Theory into the context of private higher education institutions. The findings demonstrate that digital disruption does not directly produce adaptive innovation; instead, organizational capabilities determine how institutions convert external pressures into innovative responses.

The study also contributes by integrating Dynamic Capabilities, Organizational Ambidexterity, and RBV into a unified explanation of innovation capability development in PHEIs. The results suggest that sustainable competitiveness is not achieved merely through technology adoption but through the development of internal capabilities that enable continuous adaptation.

From a practical perspective, PHEI leaders should prioritize capability development, particularly in sensing environmental changes, reconfiguring resources, strengthening innovation culture, and balancing exploration and exploitation activities. Digital transformation initiatives should therefore be embedded within broader institutional capability-building strategies rather than treated as standalone technology projects.

CONCLUSION

This study examined the factors influencing adaptive innovation development in private higher education institutions (PHEIs) by integrating digital disruption, dynamic capabilities, and organizational ambidexterity perspectives. The findings demonstrate that adaptive innovation represents a central

strategic mechanism through which PHEIs transform organizational capabilities into improved institutional outcomes.

The empirical results reveal that dynamic capabilities are the strongest determinant of adaptive innovation. This finding confirms that the ability to sense environmental changes, seize emerging opportunities, and transform organizational resources is essential for PHEIs to develop sustainable innovation capabilities. Organizational ambidexterity also contributes positively to adaptive innovation, indicating that institutions need to balance exploration of new opportunities with the effective utilization of existing resources.

Interestingly, digital disruption does not directly influence adaptive innovation. This finding suggests that technological changes alone are insufficient to generate innovation outcomes. Instead, digital disruption functions as an external stimulus that requires appropriate organizational capabilities to be transformed into meaningful innovation. This result extends the understanding of digital transformation in higher education by demonstrating that internal capability development is more critical than technology adoption alone.

Furthermore, adaptive innovation significantly improves student retention and institutional reputation. These findings indicate that innovation capability is not merely an operational response to environmental changes but also a strategic capability that enhances stakeholder value. By developing adaptive academic services, responsive learning systems, and innovative institutional processes, PHEIs can strengthen student engagement and improve their institutional image. Institutional reputation subsequently contributes to sustainable competitive advantage, confirming the strategic role of intangible resources in maintaining long-term competitiveness.

Theoretically, this study contributes by extending Dynamic Capabilities Theory in the context of private higher education. While previous studies have emphasized the importance of digital transformation and innovation adoption, this research demonstrates that organizational capabilities determine whether external changes can be effectively converted into adaptive innovation. The integration of Dynamic Capabilities, Organizational Ambidexterity, and Resource-Based View provides a more comprehensive explanation of how PHEIs develop innovation capability and achieve sustainable competitive advantage.

From a managerial perspective, PHEI leaders should avoid viewing digital transformation merely as technology implementation. Instead, institutions should prioritize capability development through strengthening strategic sensing mechanisms, improving organizational learning, developing innovation-oriented cultures, and enhancing the ability to reconfigure resources. Universities should also promote ambidextrous management practices by simultaneously encouraging innovation exploration while improving existing academic and administrative processes.

This study has several limitations. First, the cross-sectional research design limits the ability to examine changes in innovation capability over time. Second, the study focuses on PHEIs within a specific geographical context, which may limit generalization to other higher education systems with different governance structures and institutional characteristics. Third, the research relies on perceptual data collected from institutional representatives, which may introduce potential response bias.

Future research can extend this study by adopting longitudinal approaches to examine how adaptive innovation capabilities evolve over time. Further studies may also compare different types of higher education institutions, such as public universities, private universities, and different governance models, to identify contextual variations. In addition, future research could incorporate other strategic factors, such as institutional learning capability, knowledge management, leadership orientation, and digital maturity, to provide a more comprehensive understanding of innovation capability development in higher education.

Overall, this study highlights that sustainable competitiveness among PHEIs is not achieved simply through responding to digital disruption but through developing the organizational capabilities required to transform environmental challenges into adaptive innovation and strategic value creation.

ACKNOWLEDGMENT

The authors would like to thank the private higher education institutions within the LLDIKTI Region II area and all respondents who participated in this study. The authors also acknowledge the institutional support provided during the research process

AUTHOR CONTRIBUTION STATEMENT

Conceptualization, research design, methodology development, and the formulation of the theoretical framework were carried out by Yenny Marthalena, M. Yusuf S. Barusman, Andala R.P. Barusman, Defrizal, Sunarmi, and Yuni Astini. Data collection, including questionnaire administration and field data gathering across private higher education institutions, was conducted by Yenny Marthalena, M. Yusuf S. Barusman, Andala R.P. Barusman, Defrizal, Sunarmi, and Yuni Astini. Formal analysis, including measurement model assessment, structural model evaluation, and hypothesis testing using PLS-SEM with SmartPLS 4.0, was performed by Yenny Marthalena, M. Yusuf S. Barusman, Andala R.P. Barusman, Defrizal, Sunarmi, and Yuni Astini. Original draft preparation and writing were conducted by Yenny Marthalena, while review, editing, and revision were performed by M. Yusuf S. Barusman, Andala R.P. Barusman, Defrizal, Sunarmi, and Yuni Astini. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of this work.

AI DISCLOSURE STATEMENT

During the preparation of this work, the author(s) used AI-assisted tools, such as grammar checkers and language enhancement software, solely for the purpose of improving readability and refining the language of the manuscript. No generative AI tools were used for statistical data analysis using PLS-SEM, interpretation of results, conceptual development, or core scientific writing. The authors take full responsibility for the originality, accuracy, and integrity of the research findings and the final content of this article.

FUNDING STATEMENT

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. The study was conducted using the personal resources of the authors and the institutional support provided by Universitas Bandar Lampung and Universitas Aisyah Pringsewu, Indonesia.

CONFLICTS OF INTEREST

The authors declare that there are no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The research was conducted independently, and the results are presented objectively and without bias. The authors have no affiliation with or financial interest in any private higher education institution included as a sample in this study, nor in any organization that could be perceived as influencing the analysis or conclusions of this research.

REFERENCES

Abukalusa, K., & Oosthuizen, R. (2025). An adaptive organisational leadership framework through systems thinking. International Journal of Organizational Analysis, 33(8), 2673-2703. https://doi.org/10.1108/IJOA-07-2024-4635

Alenezi, M. (2023). Digital Learning and Digital Institution in Higher Education. Education Sciences. https://doi.org/10.3390/educsci13010088

Al Hassani, H., & Wilkins, S. (2022). Student retention in higher education: The role of teaching quality, institutional identification, and institutional reputation. Journal of Higher Education Policy and Management, 44(3), 293-309.

Amankwah-Amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and digitalization: The great acceleration. Journal of Business Research, 136, 602–611. https://doi.org/10.1016/j.jbusres.2021.08.01

Aula, P., & Tienari, J. (2011). Becoming "world-class"? Reputation-building in a university merger. Critical Perspectives on International Business, 7(1), 7–29. https://doi.org/10.1108/17422041111103893

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Barney, J., Wright, M., & Ketchen, D. J. (2001). The resource-based view of the firm: Ten years after 1991. Journal of Management, 27(6), 625–641. https://doi.org/10.1177/014920630102700601

Benavides, L., Tamayo Arias, J. A., Serna, M. D. A., Branch, J., & Burgos, D. (2020). Digital Transformation in Higher Education Institutions: A Systematic Literature Review. Sensors (Basel, Switzerland), 20. https://doi.org/10.3390/s20113291

Benitez, J., Arenas, A., Castillo, A., & Esteves, J. (2022). Impact of digital leadership capability on innovation performance: The role of digital transformation strategy. Technological Forecasting and Social Change, 181, 121763. https://doi.org/10.1016/j.techfore.2022.121763

Bergdahl, N., Bond, M., Sjöberg, J., Dougherty, M., & Oxley, E. (2024). Unpacking student engagement in higher education learning analytics: A systematic review. International Journal of Educational Technology in Higher Education, 21, 63. https://doi.org/10.1186/s41239-024-00493-y

Bucea-Manea-Ţoniş, R., Kuleto, V., Gudei, S., Lianu, C., Lianu, C., Ilić, M. P., & Păun, D. (2022). Artificial Intelligence Potential in Higher Education Institutions Enhanced Learning Environment in Romania and Serbia. Sustainability. https://doi.org/10.3390/su14105842

Del-Castillo-Feito, C., Blanco-González, A., & Hernández-Perlines, F. (2022). Reputation in higher education: A systematic review. Frontiers in Education, 7, 925117. https://doi.org/10.3389/feduc.2022.925117

Fernández-Gubieda, S., & Gutiérrez-García, E. (2025). University reputation overlooked: A systematic literature review of an under-researched concept. Corporate Reputation Review. https://doi.org/10.1057/s41299-025-00234-5

Fombrun, C. J. (1996). Reputation: Realizing value from the corporate image. Harvard Business School Press.

Forid, M. S., Hafez, M., & Khan, W. (2022). Student Satisfaction and Retention: Impact of Service Quality and Digital Transformation. Marketing and Management of Innovations. https://doi.org/10.21272/mmi.2022.4-14

García-Morales, V. J., Garrido-Moreno, A., & Martín-Rojas, R. (2021). The transformation of higher education after the COVID disruption: Emerging challenges in an online learning scenario. Frontiers in Psychology, 12, 616059. https://doi.org/10.3389/fpsyg.2021.616059

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). Sage Publications.

Hoch, J. E., Bommer, W. H., Dulebohn, J. H., & Wu, D. (2018). Do ethical, authentic, and servant leadership explain variance above and beyond transformational leadership? A meta-analysis. Journal of Management, 44(2), 501-529. https://doi.org/10.1177/0149206316665461

Hughes, M. (2018). Organisational ambidexterity and firm performance: Burning research questions for marketing scholars. Journal of Marketing Management, 34(1-2), 178-229. https://doi.org/10.1080/0267257X.2018.1441175

Johnston, A., Woodhouse, D., & Wells, P. (2025). University ambidexterity: Assessing the nature of interdependence between knowledge exchange and knowledge creation in UK universities. The Journal of Technology Transfer, 50, 1297–1323. https://doi.org/10.1007/s10961-024-10137-y

Kaniak, A. D., Teixeira, E. K., & Schaefer, R. (2023). Dynamic capabilities in university technology transfer offices: Evidence from Brazil. Journal of Technology Transfer, 48(3), 1015-1040. https://doi.org/10.1007/s10961-022-09945-1

Kassotaki, O. (2022). Review of organizational ambidexterity research. SAGE Open, 12(1). https://doi.org/10.1177/21582440221082127

Kok, X. F. K. (2025). The mediating role of student engagement in the relationship between teacher and digital support and learner satisfaction in blended learning environments at higher education. British Educational Research Journal. https://doi.org/10.1002/berj.4123

Kump, B., Engelmann, A., Kessler, A., & Schweiger, C. (2019). Toward a dynamic capabilities scale: Measuring organizational sensing, seizing, and transforming capacities. Industrial and Corporate Change, 28(5), 1149-1172. https://doi.org/10.1093/icc/dty054

Lawson, B., & Samson, D. (2001). Developing innovation capability in organisations: A dynamic capabilities approach. International Journal of Innovation Management, 5(3), 377-400. https://doi.org/10.1142/S1363919601000427

Lissillour, R., & Rodriguez-Escobar, J. A. (2023). "Organizational ambidexterity" and the learning organization: The strategic role of a corporate university. The Learning Organization, 30(1), 55–75. https://doi.org/10.1108/TLO-04-2022-0046

Lynch, R., & Baines, P. (2004). Strategy development in UK higher education: Towards resource-based competitive advantages. Journal of Higher Education Policy and Management, 26(2), 171-187. https://doi.org/10.1080/1360080042000218249

Martínez-Román, J. A., Gamero, J., Tamayo, J., & Delgado-González, M. L. (2025). Empirical analysis of the technological exploration–exploitation balance and its impact on organizational performance under uncertainty. Humanities and Social Sciences Communications, 12, 221. https://doi.org/10.1057/s41599-025-04476-w

McLean, S. N. B. (2025). Elevating Strategy and Innovation for Relevance for South African Private Higher Education Institutions. Journal of Management Perspectives. https://doi.org/10.64287/jmp.2026.2.12

Mexhuani, B. (2024). Adopting Digital Tools in Higher Education: Opportunities, Challenges and Theoretical Insights. European Journal of Education. https://doi.org/10.1111/ejed.12819

Molina-Carmona, R., López-Celentano, A., & others. (2023). Digital transformation initiatives in higher education institutions: A multivocal literature review. Education and Information Technologies, 28, 12351–12382. https://doi.org/10.1007/s10639-022-11544-0

Mousa, S., & Bouraoui, T. (2026). Resilience in service innovation ecosystems: adaptive capacities, co-creation and institutional agility amid external shocks. Journal of Service Theory and Practice, 1-20. https://doi.org/10.1108/JSTP-06-2025-0231

Nkomo, L. M., Daniel, B. K., & Butson, R. J. (2021). Synthesis of student engagement with digital technologies: A systematic review of the literature. International Journal of Educational Technology in Higher Education, 18, 34. https://doi.org/10.1186/s41239-021-00270-1

Ojika, F. U., Owobu, W. O., Abieba, O., Esan, O., Ubamadu, B. C., & Daraojimba, A. I. (2023). Transforming Cloud Computing Education: Leveraging AI and Data Science for Enhanced Access and Collaboration in Academic Environments. Journal of Frontiers in Multidisciplinary Research. https://doi.org/10.54660/.ijfmr.2023.4.1.138-156

O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. Academy of Management Perspectives, 27(4), 324–338. https://doi.org/10.5465/amp.2013.0025

Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. L. (2009). Organizational ambidexterity: Balancing exploitation and exploration for sustained performance. Organization Science, 20(4), 685-695. https://doi.org/10.1287/orsc.1090.0428

Sahni, J., Smith, K., & Thompson, R. (2024). Digital transformation in higher education: A systematic review. Studies in Higher Education, 49(2), 234-251. https://doi.org/10.1080/03075079.2023.2178521

Singun, A. J. (2025). Unveiling the barriers to digital transformation in higher education institutions: A systematic literature review. Discover Education, 4, 37. https://doi.org/10.1007/s44217-025-00430-9

Stolze, A., & Sailer, K. (2022). Advancing dynamic capabilities of universities: How third mission engagement can strengthen knowledge transfer. Studies in Higher Education, 47(4), 823-838. https://doi.org/10.1080/03075079.2020.1817889

Sung, M., & Yang, S. U. (2008). Toward the model of university image: The influence of brand personality, external prestige, and reputation. Journal of Public Relations Research, 20(4), 357–376. https://doi.org/10.1080/10627260802153207

Surjawan, D. J., Langi, A., & Imbar, R. (2025). Digital Transformation for Institution Operations in Higher Education: A Literature Review. IEEE Access, 13, 61457-61468. https://doi.org/10.1109/access.2025.3557446

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Tinto, V. (2017). Through the eyes of students. Journal of College Student Retention: Research, Theory & Practice, 19(3), 254–269. https://doi.org/10.1177/1521025115621917

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research, 122, 889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. Journal of Strategic Information Systems, 28(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Long Range Planning, 52(3), 326–349. https://doi.org/10.1016/j.lrp.2018.12.001