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AI-Driven Digital Transformation Capability and Educational Leadership Competencies as Predictors of Academic Innovation in Higher Education Institutions

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Abstract. This study examined whether AI-driven digital transformation capability and educational leadership competencies significantly predict academic innovation in selected higher education institutions (HEIs). Using a quantitative, non-experimental predictive research design, the study involved 128 academic administrators selected through total enumeration. Data were gathered using a validated and reliability-tested questionnaire and analyzed through mean, standard deviation, Pearson product-moment correlation, and multiple linear regression. Findings revealed high levels of AI-driven digital transformation capability (M = 3.89), educational leadership competencies (M = 3.86), and academic innovation (M = 3.89). However, correlation analysis showed no significant relationships among the variables ($p > .05$). Similarly, regression analysis indicated that AI-driven digital transformation capability and educational leadership competencies did not significantly predict academic innovation ($R = 0.049$, $R^2 = 0.002$, $p > .05$). These results suggest that technological readiness and leadership competencies alone do not sufficiently explain variations in academic innovation. The study recommends strengthening innovation-oriented institutional culture, faculty readiness, professional development, resource allocation, and organizational support. Higher education institutions should also establish responsible AI integration policies and implement continuous monitoring and evaluation of innovation initiatives. Future studies should examine additional organizational and contextual factors influencing academic innovation.

Keywords: Artificial Intelligence; Academic Innovation; Digital Transformation Capability; Educational Leadership Competencies; Higher Education Institutions

Introduction

The rapid advancement of artificial intelligence (AI) has transformed the higher education landscape by reshaping teaching, learning, research, and institutional management. As higher education institutions (HEIs) strive to remain competitive in the digital era, AI has become an essential enabler of digital transformation, supporting data-driven decision-making, personalized learning, intelligent automation, and institutional innovation. The increasing adoption of AI technologies has encouraged universities to rethink traditional educational models and develop institutional capabilities that can effectively integrate emerging digital technologies into academic and administrative functions (Zawacki-Richter et al., 2023; George & Wooden, 2023).

Digital transformation in higher education extends beyond the implementation of technological tools. It involves a comprehensive organizational change encompassing technological infrastructure, institutional policies, governance systems, organizational culture, and human resource development. According to Fernández et al. (2023), digital transformation requires universities to align technology initiatives with strategic institutional goals while enhancing organizational processes and stakeholder engagement. Their review further emphasizes that institutions with higher levels of digital maturity are better positioned to sustain innovation and improve educational quality.

Within this context, AI-driven digital transformation capability has emerged as a critical organizational resource that enables higher education institutions to leverage AI technologies effectively. AI technologies such as machine learning, predictive analytics, intelligent tutoring systems, and generative AI are increasingly utilized to improve curriculum planning, automate administrative tasks, enhance student support services, and facilitate evidence-based decision-making. However, the successful implementation of AI

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depends not only on technological investments but also on institutional readiness, ethical governance, and strategic leadership (George & Wooden, 2023; Castillo-Martínez et al., 2024).

Despite the growing availability of AI technologies, digital transformation cannot be achieved without effective educational leadership. Educational leaders play a pivotal role in shaping institutional vision, managing organizational change, fostering innovation, and creating an environment that supports digital transformation. Strategic leadership enables academic administrators to formulate long-term digital strategies aligned with institutional goals, while digital leadership promotes technology adoption and digital culture among faculty and staff. Likewise, instructional leadership ensures that AI integration enhances curriculum development, teaching effectiveness, and student learning outcomes. Recent studies have consistently recognized leadership as one of the most influential factors in the success of digital transformation initiatives within higher education institutions (Fernández et al., 2023; Sukandi, 2024).

Educational leadership competencies have become increasingly important as universities respond to the opportunities and challenges presented by AI. Leaders are expected to possess not only traditional administrative skills but also competencies related to digital innovation, technology management, data-informed decision-making, and organizational agility. Effective educational leaders cultivate collaborative cultures that encourage faculty engagement, continuous professional development, and innovative instructional practices. Such competencies enable institutions to respond proactively to technological disruptions while ensuring that digital transformation contributes meaningfully to institutional effectiveness and educational excellence (George & Wooden, 2023; Rêgo et al., 2024).

One of the most significant outcomes of AI-driven digital transformation and effective educational leadership is academic innovation. Academic innovation refers to the continuous improvement and development of curricula, teaching and learning strategies, research practices, and knowledge creation to address the evolving needs of students, industries, and society. AI technologies provide opportunities for universities to redesign curricula, personalize instruction, improve research productivity, strengthen interdisciplinary collaboration, and enhance institutional competitiveness. Consequently, higher education institutions that effectively integrate AI with competent educational leadership are more likely to foster sustainable academic innovation and improve overall institutional performance (Castillo-Martínez et al., 2024; George & Wooden, 2023).

Although extensive studies have examined artificial intelligence, digital transformation, educational leadership, and academic innovation separately, empirical research investigating their combined influence remains limited. Existing studies have primarily focused on AI adoption, digital technologies, or leadership practices independently without examining how AI-driven digital transformation capability and educational leadership competencies jointly predict academic innovation in higher education institutions. This gap is particularly evident in developing countries, where universities continue to experience disparities in technological readiness, leadership capacity, and innovation performance despite increasing investments in digital transformation.

In the Philippine higher education context, universities are actively embracing digital transformation initiatives to improve educational quality, strengthen institutional competitiveness, and respond to the increasing influence of artificial intelligence in education. However, variations in AI readiness, digital governance, leadership competencies, and innovation practices remain evident across institutions. Understanding how AI-driven digital transformation capability and educational leadership competencies contribute to academic innovation is therefore essential for developing evidence-based policies and strategic interventions that support sustainable institutional development.

Research Questions

This study aims to determine whether AI-driven digital transformation capability and educational leadership competencies predict academic innovation in higher education institutions
Specifically, it seeks to answer the following questions;

1. What is the level of AI-driven digital transformation capability in higher education institutions in terms of:
   1.1 AI infrastructure and technology readiness
   1.2 AI integration in academic and administrative processes
   1.3 digital governance and data management
2. What is the level of educational leadership competencies of academic administrators in terms of:
   2.1 Strategic leadership
   2.2 Digital leadership
   2.3 Instructional leadership
3. What is the level of academic innovation in higher education institutions in terms of?
   3.1 Curriculum Innovation;

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3.2 Teaching and Learning Innovation;
3.3 Research and Knowledge Innovation

4. Is there a significant relationship among AI-driven digital transformation capability, educational leadership competencies, and academic innovation?
5. Do AI-driven digital transformation capability and educational leadership competencies significantly predict academic innovation in higher education institutions?

Scope and Delimitation of the Study

This study examined the predictive relationship of AI-driven digital transformation capability and educational leadership competencies with academic innovation in selected higher education institutions (HEIs). It covered 128 academic administrators, including deans, department chairpersons, program coordinators, and other academic leaders, selected through purposive sampling and total enumeration. The study assessed AI-driven digital transformation capability through AI infrastructure and technology readiness, AI integration, and digital governance; educational leadership competencies through strategic, digital, and instructional leadership; and academic innovation through curriculum, teaching and learning, and research and knowledge innovation. Using a quantitative, non-experimental predictive design, data were gathered through a validated 45-item, five-point Likert-scale questionnaire and analyzed using descriptive statistics, Spearman's rho, and multiple linear regression. The study was limited to the participating administrators and selected institutional variables; other factors potentially influencing academic innovation, such as organizational culture, faculty readiness, and institutional support, were not included. Furthermore, the findings were based on respondents' assessments and did not establish causal relationships.

Literature Review

Artificial Intelligence in Higher Education

Artificial intelligence has become an important component of higher education as institutions increasingly adopt intelligent technologies to improve teaching, learning, assessment, and academic management. Zawacki-Richter et al. (2019) conducted a systematic review of research on artificial intelligence applications in higher education and identified four major areas: profiling and prediction, intelligent tutoring systems, assessment and evaluation, and adaptive systems and personalization. Their findings demonstrated that AI offers opportunities to improve educational processes through data-driven decision-making, personalized learning, and automated assessment. However, the researchers also emphasized the need for greater involvement of educators in AI development and implementation. This suggests that the integration of artificial intelligence in higher education requires not only technological resources but also institutional readiness and active participation of academic leaders. This literature supports the present study's examination of AI infrastructure, technology readiness, and AI integration in academic and administrative processes.

Crompton and Burke (2023) further examined the development of artificial intelligence in higher education through a systematic review of 138 research articles published between 2016 and 2022. Their findings identified five major applications of AI: assessment and evaluation, prediction, AI assistants, intelligent tutoring systems, and managing student learning. The review also showed the increasing attention given to AI applications in higher education, particularly in supporting students and improving instructional processes. These findings indicate that AI can contribute to institutional development by providing technological solutions for academic services and learning management. However, successful implementation requires institutions to establish appropriate technological infrastructure, policies, and organizational support. This study provides a foundation for examining the AI-driven digital transformation capability of higher education institutions.

Digital Transformation Capability in Higher Education Institutions

Digital transformation involves more than adopting technological tools; it requires coordinated changes in institutional strategies, organizational processes, information systems, and human resources. Fernández et al. (2023) conducted a multivocal literature review examining digital transformation initiatives in higher education institutions. Their findings identified several institutional initiatives involving digital technologies, advanced analytics, cloud computing, and artificial intelligence. The researchers emphasized that digital transformation should be aligned with institutional strategies rather than implemented through isolated technological projects. They also highlighted the importance of developing an integrated digital strategy to improve institutional digital maturity. This literature supports the present study's focus on AI infrastructure and technology readiness, AI integration in academic and administrative processes, and digital governance and data management as essential dimensions of digital transformation capability.

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Digital Governance and Data Management

Digital governance plays an important role in ensuring that technological resources are effectively managed and aligned with institutional objectives. Fernández et al. (2023) explained that digital transformation in universities requires coordinated initiatives involving institutional information, processes, technologies, and organizational responsibilities. Their review suggests that institutions need comprehensive digital strategies to ensure that technology investments contribute to meaningful organizational transformation. Similarly, Zawacki-Richter et al. (2019) emphasized the need to consider the educational and organizational implications of AI applications rather than focusing exclusively on technological development. These findings establish the importance of institutional policies, responsible technology implementation, and appropriate data management practices. In relation to the present study, digital governance and data management represent important components of institutional capability because they provide direction and organizational mechanisms for the effective use of AI technologies.

Educational Leadership Competencies in Digital Transformation

Educational leadership competencies are essential in guiding higher education institutions through technological changes and organizational development. Carvalho et al. (2022) examined the relationship between leadership styles, digital transformation, and institutional performance in state higher education through a systematic literature review. Their findings identified transformational leadership as the most frequently discussed leadership approach and highlighted the importance of digital technologies and online learning systems in institutional performance. The researchers emphasized that leadership and digital transformation should be considered together when examining the performance of higher education institutions. This suggests that academic administrators must possess the ability to establish institutional direction, manage technological changes, and support educational improvement. The study is relevant to the present research because it provides a foundation for examining educational leadership competencies alongside AI-driven digital transformation capability.

Digital Leadership in Higher Education

Digital leadership has become increasingly important as higher education institutions respond to technological developments and the growing demands of digital transformation. Jameson et al. (2022) conducted a systematic review of digital leadership research in higher education, examining studies published between 1999 and 2022. Their review identified the growing importance of digital leadership in institutional administration, teaching, and organizational development. However, the researchers also found limitations in the theoretical development and empirical evidence supporting digital leadership practices. They emphasized the need for clearer definitions, stronger research frameworks, and further investigation into leadership competencies required in digitally transforming institutions. These findings support the present study's inclusion of digital leadership as one of the dimensions of educational leadership competencies. They also suggest that academic administrators need to develop the capacity to manage digital resources, encourage technology adoption, and guide institutional change.

Cheng et al. (2024) conducted a systematic review of digital academic leadership in higher education, analyzing 39 published articles from January 2003 to June 2023. Their study explored the meaning, dimensions, and conceptual foundations of digital academic leadership. The researchers recognized digital academic leadership as an important component of academic development, particularly in environments where digital platforms and technologies are increasingly integrated into educational activities. Their findings emphasized the importance of understanding how academic leaders use digital technologies to support institutional and academic objectives. This literature is relevant to the present study because digital leadership requires academic administrators to promote technological integration, facilitate collaboration, and support the development of innovative academic practices.

Curriculum Innovation in Higher Education

Curriculum innovation is an important dimension of academic innovation because higher education institutions must continuously improve their academic programs to respond to changing educational and professional demands. Tassone et al. (2022) developed a Course Innovation Framework to examine different aspects of course innovation in higher education. Their framework considered three stages of innovation: intended, implemented, and attained. It also identified important areas, including the rationale for innovation, the nature of innovation, teaching and learning practices, evaluation, dissemination, and institutional reflection. The researchers emphasized that curriculum and course innovation should be systematically planned, implemented, evaluated, and improved. This suggests that academic innovation requires more than introducing new subjects or technologies; it involves continuous curriculum development and assessment. The

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study supports the present research's examination of curriculum innovation as a dimension of academic innovation in higher education institutions.

Academic Innovation and Teaching and Learning Innovation

Innovation in teaching and learning involves the adoption of new instructional approaches, learning technologies, and educational practices that improve the academic experience of students. Crompton and Burke (2023) identified several applications of artificial intelligence that support teaching and learning, including intelligent tutoring systems, AI assistants, personalized learning, and automated assessment. Their findings demonstrate how emerging technologies can provide opportunities for improving instructional delivery and supporting different learning needs. Similarly, Tassone et al. (2022) emphasized that teaching and learning innovation should be examined through the processes of planning, implementation, evaluation, and improvement. Together, these studies suggest that academic innovation involves both technological integration and the continuous improvement of instructional practices. This supports the inclusion of teaching and learning innovation in the present study as one of the indicators of academic innovation.

Research and Knowledge Innovation in Higher Education

Research and knowledge innovation contribute to the development of higher education institutions by promoting knowledge creation, scholarly collaboration, and the application of emerging technologies in research activities. Zawacki-Richter et al. (2019) identified profiling, prediction, intelligent tutoring, assessment, and adaptive learning as important applications of artificial intelligence in higher education. These applications demonstrate the potential of AI to support evidence-based educational decisions and improve academic processes. Furthermore, Fernández et al. (2023) identified advanced analytics and artificial intelligence among the technologies increasingly adopted by higher education institutions as part of their digital transformation initiatives. These findings suggest that technological development can provide opportunities for strengthening research processes, knowledge management, and institutional innovation. However, institutions must establish appropriate strategies and organizational support to ensure that technological investments contribute to meaningful academic development. This literature supports the present study's inclusion of research and knowledge innovation as a dimension of academic innovation.

Methodology

Research Design

This study employed a quantitative, non-experimental predictive research design to determine whether AI-driven digital transformation capability and educational leadership competencies significantly predicted academic innovation in higher education institutions. The predictive design was appropriate because it examined the influence of the independent variables on the dependent variable without manipulating any of the variables under investigation (Creswell J.W & Creswell J.D, 2017). Specifically, the study determined the levels of AI-driven digital transformation capability, educational leadership competencies, and academic innovation. It also examined the significant relationships among these variables and determined whether AI-driven digital transformation capability and educational leadership competencies significantly predicted academic innovation. Data were gathered through a structured survey questionnaire and analyzed using appropriate descriptive and inferential statistical techniques.

Research Locale

The study was conducted in selected higher education institutions (HEIs) in Zamboanga City, Philippines. Zamboanga City served as the geographical setting of the study, which examined AI-driven digital transformation capability, educational leadership competencies, and academic innovation in higher education institutions. The selected HEIs provided the institutional context for assessing the level of AI-driven digital transformation capability, educational leadership competencies, and academic innovation. Data were gathered from the participating academic administrators to determine the relationships among these variables and examine the extent to which AI-driven digital transformation capability and educational leadership competencies predict academic innovation.

Research Participants

The respondents consisted of 128 academic administrators, including deans, department chairpersons, program coordinators, and other academic leaders from the participating institutions. They were selected as respondents because of their involvement in academic leadership, institutional management, and the implementation of academic and digital initiatives.

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Research Instrument

The study utilized a structured survey questionnaire as the primary research instrument to gather data on AI-driven digital transformation capability, educational leadership competencies, and academic innovation in selected higher education institutions in Zamboanga City. The questionnaire consisted of 45 statements, divided into three major sections corresponding to the three variables of the study. Each variable comprised three dimensions, with five items assigned to each dimension. The first section measured AI-Driven Digital Transformation Capability in terms of (1) AI infrastructure and technology readiness, (2) AI integration in academic and administrative processes, and (3) digital governance and data management. The second section assessed Educational Leadership Competencies, covering (1) strategic leadership, (2) digital leadership, and (3) instructional leadership. The third section measured Academic Innovation through (1) curriculum innovation, (2) teaching and learning innovation, and (3) research and knowledge innovation. All questionnaire items were rated using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument underwent expert validation by specialists in educational management, digital transformation, and research methodology to establish content validity. Pilot testing was also conducted to determine its internal consistency using Cronbach's Alpha. The reliability coefficients ranged from 0.700 to 0.767 across the nine dimensions, indicating acceptable internal consistency.

Data Gathering Procedure

The researcher first secured permission from the administrators of the selected higher education institutions (HEIs) in Zamboanga City to conduct the study. Upon approval, the researcher coordinated with the concerned institutional representatives to facilitate the distribution of the survey questionnaire to the 128 academic administrators, including deans, department chairpersons, program coordinators, and other academic leaders. The respondents were selected through convenience sampling based on their accessibility, availability, and willingness to participate. Before administering the questionnaire, the researcher explained the purpose of the study, ensured voluntary participation, and obtained informed consent from the respondents. The questionnaires were distributed through printed copies and/or an online survey platform. After the data collection, the completed questionnaires were retrieved, checked for completeness, encoded, and organized for statistical analysis. All responses were treated with confidentiality and used solely for research purposes.

Results and Discussions

Research Question 1: What is the level of AI-driven digital transformation capability in higher education institutions in terms of AI infrastructure and technology readiness, AI integration in academic and administrative processes, digital governance and data management?

Table 1. Level of AI-driven digital transformation capability

Indicators	Weighted Mean	Perception	Interpretation
1. AI infrastructure and technology readiness	3.90	Agree	High Capability
2. AI integration in academic and administrative processes	3.83	Agree	High Capability
3. Digital governance and data management	3.95	Agree	High Capability
Average	**3.89**	**Agree**	**High Capability**

Table 1 presents the level of AI-driven digital transformation capability among higher education institutions across three key indicators: AI infrastructure and technology readiness, AI integration in academic and administrative processes, and digital governance and data management. The findings revealed that all indicators obtained weighted mean scores within the "Agree" range, indicating a High Capability level of AI-driven digital transformation. Among the indicators, digital governance and data management obtained the highest weighted mean (WM = 3.95), followed by AI infrastructure and technology readiness (WM = 3.90), while AI integration in academic and administrative processes received the lowest weighted mean (WM = 3.83). The overall average weighted mean of 3.89 further indicates that the respondents generally perceived their institutions as having a high capability in implementing AI-driven digital transformation initiatives.

These findings suggest that the participating higher education institutions have established a strong foundation for digital transformation through adequate technological infrastructure, effective governance of digital resources, and the adoption of AI-enabled systems in both academic and administrative operations. The relatively higher rating for digital governance and data management implies that institutions prioritize data

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security, digital policies, and the efficient management of information systems, which are essential for sustainable AI implementation. Although AI integration in academic and administrative processes received the lowest mean among the indicators, it still falls within the High Capability category, indicating that AI applications are already being utilized to enhance institutional operations, teaching, learning, and decision-making. Overall, the results demonstrate that the institutions possess the necessary technological readiness and organizational support to advance AI-driven digital transformation in higher education.

Research Question 2: What is the level of educational leadership competencies of academic administrators in terms of strategic leadership, digital leadership and instructional leadership?

Table 2. Level of Educational Leadership Competencies

Indicators	Weighted Mean	Perception	Interpretation
1. Strategic leadership	3.88	Agree	High Level
2. Digital leadership	3.86	Agree	High Level
3. Instructional leadership	3.83	Agree	High Level
Average	**3.86**	**Agree**	**High Level**

Table 2 presents the respondents' assessment of the educational leadership competencies of academic leaders in higher education institutions. The findings revealed an overall weighted mean of 3.86, with a verbal perception of Agree and an interpretation of High Level. This indicates that respondents generally perceive academic leaders as possessing a high level of competence in leading their institutions toward achieving educational goals. The results suggest that academic leaders effectively perform their leadership roles by providing strategic direction, promoting innovation, supporting faculty development, and creating an environment that enhances institutional effectiveness and academic excellence.

Among the three indicators, strategic leadership obtained the highest weighted mean of 3.88 (Agree, High Level), indicating that respondents highly recognize the ability of academic leaders to formulate strategic plans, communicate a clear institutional vision, and make decisions that support organizational growth. Digital leadership ranked second with a weighted mean of 3.86 (Agree, High Level), reflecting that academic leaders actively encourage the adoption of digital technologies and artificial intelligence to improve academic and administrative processes. Meanwhile, instructional leadership received the lowest weighted mean of 3.83 (Agree, High Level). Although it ranked lowest among the indicators, it still demonstrates a high level of competency, suggesting that academic leaders continuously support instructional improvement, faculty professional development, and student-centered teaching practices. Overall, the consistently high ratings across all dimensions indicate that academic leaders possess the competencies needed to effectively lead higher education institutions and foster academic innovation in an increasingly digital educational environment.

Research Question 3: What is the level of academic innovation in higher education institutions in terms of curriculum innovation, teaching and learning innovation, research and knowledge innovation?

Table 3. Level of Academic Innovation

Indicators	Weighted Mean	Perception	Interpretation
1. Curriculum innovation	3.90	Agree	High Level
2. Teaching and learning innovation	3.90	Agree	High Level
3. Research and knowledge innovation	3.88	Agree	High Level
Average	**3.89**	**Agree**	**High Level**

Table 3 presents the respondents' assessment of the level of academic innovation in higher education institutions across three dimensions: curriculum innovation, teaching and learning innovation, and research and knowledge innovation. The findings revealed an overall weighted mean of 3.89, with a verbal perception of Agree and an interpretation of High Level. This indicates that respondents generally perceive their institutions as demonstrating a high level of academic innovation. The results suggest that higher education institutions continuously implement innovative practices that improve curriculum development, enhance teaching and learning processes, and strengthen research and knowledge creation to meet the evolving demands of higher education.

Among the three dimensions, curriculum innovation and teaching and learning innovation both obtained the highest weighted mean of 3.90 (Agree, High Level), indicating that respondents recognize their institutions' strong commitment to continuously updating academic programs, integrating emerging technologies, adopting innovative teaching strategies, and enhancing student learning experiences. These

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findings imply that institutions actively promote modern and flexible educational practices that prepare students with relevant knowledge and competencies for the changing academic and professional landscape. Meanwhile, research and knowledge innovation recorded a weighted mean of 3.88 (Agree, High Level). Although it received the lowest mean among the three indicators, it still reflects a high level of innovation, suggesting that institutions effectively support research activities, encourage knowledge creation and dissemination, and foster a culture of scholarly inquiry and collaboration. Overall, the consistently high ratings across all dimensions demonstrate that higher education institutions maintain a strong commitment to academic innovation, contributing to institutional excellence, improved educational quality, and sustainable development.

Research Question 4: Significant Relationship among AI-driven digital transformation capability, educational leadership competencies, and academic innovation?

Table 4. Relationship among AI-driven digital transformation capability, educational leadership competencies, and academic innovation

Variables Compared	Correlation Coefficient (rho)	p-value	Interpretation
1. AI-Driven Digital Transformation Capability & Educational Leadership Competencies	-0.057	.523	Negligible Negative Correlation (Not Significant)
2. AI-Driven Digital Transformation Capability & Academic Innovation	-0.017	.850	Negligible Negative Correlation (Not Significant)
3. Educational Leadership Competencies & Academic Innovation	0.036	.686	Negligible Positive Correlation (Not Significant)

Table 4 presents the results of the Spearman's rho correlation analysis examining the relationships among AI-driven digital transformation capability, educational leadership competencies, and academic innovation in higher education institutions. The findings revealed that none of the relationships among the variables were statistically significant, as all computed p-values were greater than the 0.05 level of significance. This indicates that the observed relationships are too weak to establish a meaningful association among the variables. Consequently, the findings suggest that variations in AI-driven digital transformation capability and educational leadership competencies are not significantly associated with variations in academic innovation within the participating higher education institutions.

Specifically, the relationship between AI-driven digital transformation capability and educational leadership competencies yielded a correlation coefficient of -0.057 with a p-value of .523, indicating a negligible negative correlation that is not statistically significant. Similarly, the relationship between AI-driven digital transformation capability and academic innovation produced a correlation coefficient of -0.017 with a p-value of .850, reflecting a negligible negative correlation that is likewise not significant. On the other hand, the relationship between educational leadership competencies and academic innovation resulted in a correlation coefficient of 0.036 with a p-value of .686, indicating a negligible positive correlation that is also not statistically significant. Overall, these findings imply that although the institutions reported high levels of AI-driven digital transformation capability, educational leadership competencies, and academic innovation individually, these variables did not demonstrate significant relationships with one another in this study. Therefore, the null hypothesis stating that there is no significant relationship among the variables is accepted.

Research Question 5: AI-driven digital transformation capability and educational leadership competencies significantly predict academic innovation in higher education institutions?

Table 5. Regression Analysis of AI-driven digital transformation capability and educational leadership competencies predict academic innovation in higher education institutions

Model Fit Measures				
Model	**R**	**R^2**	**N**	**Interpretation**
1	0.049	0.002	128	Very low predictive power

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Omnibus ANOVA Test						
Source	Sum of Squares	df	Mean Square	F	p-value	Interpretation
1. AI-Driven Digital Transformation Capability	0.0198	1	0.0198	0.2849	.594	Not Significant
2. Educational Leadership Competencies	0.00036	1	0.00036	0.0051	.943	Not Significant
3. Residual	8.6984	125	0.0696	—	—	—

Regression Coefficients Predicting Academic Innovation					
Predictor	Unstandardized Coefficient (B)	Standard Error (SE)	t	p-value	Interpretation
1. Constant	4.043	0.512	7.889	< .001	Significant
2. AI-Driven Digital Transformation Capability	-0.046	0.085	-0.533	.594	Not Significant
3. Educational Leadership Competencies	0.007	0.092	0.072	.943	Not Significant

Tables 5 present the results of the multiple linear regression analysis conducted to determine whether AI-driven digital transformation capability and educational leadership competencies significantly predict academic innovation in higher education institutions. As shown in Table 6, the regression model obtained a correlation coefficient (R = 0.049) and a coefficient of determination (R^2 = 0.002), indicating very low predictive power. This means that only 0.2% of the variance in academic innovation is explained by the combined influence of AI-driven digital transformation capability and educational leadership competencies, while the remaining 99.8% is attributable to other factors not included in the model. These findings suggest that the two predictor variables have minimal explanatory power in accounting for variations in academic innovation among the participating institutions.

The results of the Omnibus ANOVA Test in Table 7 further revealed that neither predictor made a statistically significant contribution to the regression model. AI-driven digital transformation capability yielded an F-value of 0.2849 with a p-value of .594, while educational leadership competencies obtained an F-value of 0.0051 with a p-value of .943. Since both p-values are greater than the 0.05 level of significance, the findings indicate that neither variable significantly predicts academic innovation. Similarly, the regression coefficients presented in Table 8 support these results. AI-driven digital transformation capability produced an unstandardized coefficient of B = -0.046 (t = -0.533, p = .594), while educational leadership competencies yielded B = 0.007 (t = 0.072, p = .943). Both predictors were found to be statistically insignificant, indicating that changes in either variable do not significantly influence the level of academic innovation. Although the regression constant was statistically significant (B = 4.043, p < .001), it only represents the estimated baseline level of academic innovation when the predictor variables are held constant. Overall, the findings indicate that AI-driven digital transformation capability and educational leadership competencies do not significantly predict academic innovation in the participating higher education institutions. Therefore, the null hypothesis stating that AI-driven digital transformation capability and educational leadership competencies do not significantly predict academic innovation is accepted.

Ethical Considerations

This study observed strict ethical standards throughout the data collection and analysis process to ensure the protection, dignity, and rights of all respondents involved. Prior to the conduct of the study, approval and permission were secured from the appropriate institutional authorities and the administrators of the selected higher education institutions. Participation in the study was voluntary, and respondents were informed that they could withdraw at any time without any penalty or negative consequences. The researcher ensured informed consent by clearly explaining the purpose of the study, the procedures involved, and how the data would be used. Respondents were also assured of confidentiality, anonymity, and data privacy, and no identifying information was included in the research instrument. These procedures aligned with established ethical guidelines for research involving human participants (Bryman, 2016; Creswell & Creswell, 2017). All collected data were used solely for academic and research purposes and were securely stored to prevent unauthorized access. The researcher also ensured that no harm, discomfort, or risk was imposed on the

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participants throughout the research process. Ethical principles such as respect for persons, beneficence, and justice were strictly observed in accordance with standard research ethics frameworks (Bryman, 2016). Furthermore, proper acknowledgment and citation of all sources were observed to avoid plagiarism and maintain academic integrity.

Conclusion

This study examined the predictive influence of AI-driven digital transformation capability and educational leadership competencies on academic innovation in selected higher education institutions. The findings revealed that the institutions demonstrated high levels of AI-driven digital transformation capability, educational leadership competencies, and academic innovation. However, no significant relationships were found among these variables. Furthermore, AI-driven digital transformation capability and educational leadership competencies did not significantly predict academic innovation. These findings suggest that although higher education institutions possess favorable technological capabilities and competent educational leaders, these factors alone are insufficient to explain academic innovation. Therefore, academic innovation appears to be influenced by other organizational and contextual factors beyond the variables investigated in this study.

Recommendations

The following are the recommendations of the researcher, higher education institutions should continue strengthening their AI-driven digital transformation initiatives and educational leadership competencies while fostering organizational conditions that support academic innovation. Institutional leaders should promote collaborative innovation, faculty development, research engagement, and supportive organizational cultures that encourage innovative academic practices. Future researchers are encouraged to investigate additional predictors of academic innovation, such as organizational culture, innovation climate, faculty readiness, institutional support, and technology acceptance, using larger and more diverse samples to further explain the factors influencing academic innovation in higher education institutions.

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