

## EMPOWERING HIGHER EDUCATION: INSTITUTIONAL PERFORMANCE AS A KEY FACTOR

Nur Hayati<sup>1\*</sup>, Dani Sopian<sup>2</sup>, Arief Yanto Rukmana<sup>3</sup>  
<sup>1,2,3</sup>Sekolah Tinggi Ilmu Ekonomi STAN IM, Indonesia  
\*Corresponding Author:  
[nurhanifaris77@gmail.com](mailto:nurhanifaris77@gmail.com)

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### Abstract

One of the industries that is expanding is higher education, and it is seeing more and more competition. Strong leadership and the use of artificial intelligence technologies are viewed as the keys to raising higher education's effectiveness and competitiveness. In order to better understand how leadership, artificial intelligence, and higher education technology work together to improve higher education's competitive advantage, this study examines the relationships between artificial intelligence, leadership, and higher education competitiveness. It also takes into account the potential influence of higher education's performance as moderation. Using a sample of 250 students from five private higher education institutions in Bandung that provide recognized B Management study programs, this study employed the Purposive Sampling approach. SEM PLS (Partial Least Square) is the approach used for data analysis in this study. The findings demonstrate a strong, direct, and beneficial relationship between leadership and artificial intelligence and the effectiveness and competitiveness of higher education. It is anticipated that the study's conclusions will offer executives, employees, and practitioners in higher education insightful information. Finding the important variables that influence the competitiveness of higher education, such as the ways in which artificial intelligence and good leadership can work together, can help with strategic decision-making for the growth of long-lasting institutions.

Keywords: Competitiveness, Artificial Intelligence, Leadership, Performance, Higher Education

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### 1. Introduction

Higher education is one of the areas that is always growing and faces increased competition (Chatterjee & Bhattacharjee, 2020). The use of Artificial Intelligence technology is considered as a strategy to improve the competitiveness of higher education. Higher education institutions are those that provide education beyond high school, typically at a college or university, and play an important role in generating exceptional human resources and contributing to societal progress. In an era of globalization and increased competition, Higher Education faces not only academic issues, but also managerial qualities in resource management and competitiveness. Leadership and the utilization of technology, particularly artificial intelligence, are critical aspects that can have an impact on higher education institutions' performance. (Chatterjee & Bhattacharjee, 2020).

Higher education leadership has a substantial impact on organizational performance. Several research (Conte et al., 2018; Clark et al., 2020) have shown that strong and individual development-oriented leadership can improve both academic and non-academic outcomes. Meanwhile, Artificial Intelligence, a technology that is rapidly being used in the management of higher education institutions, can speed up decision-making,

enhance operational efficiency, and provide a competitive advantage. (Smith et al., 2019; Brown and Miller, 2021).

Although the literature on the impact of leadership and artificial intelligence on the performance of higher education institutions has grown, research on the interaction of the two variables, as well as the role of Higher Education performance as a moderation variable, remains scarce. (Apriyani, 2022) As a result, this study appears to fill a vacuum in the literature by looking into how leadership and artificial intelligence affect the competitiveness of higher education institutions at the same time, with Higher Education performance serving as a moderator variable.

Several prior studies have underlined the importance of leadership and artificial intelligence in higher education, but there is a paucity of research that combines the two and considers competitiveness as a moderating factor. For example, (Arenal et al., 2020) found that transformational leadership improves academic performance in higher education, whereas (Ritongan et al. 2018) found that artificial intelligence has a key role in enhancing operational efficiency.

On the other hand, artificial intelligence, as a rapidly evolving technology concept, has proven to improve the efficiency of decision-making processes and provide intelligent solutions in a variety of management contexts (Salim et al., 2019). Higher Educations, play an integral role in shaping the intellectuality and professionalism of future generations. Faced with the dynamics of the global environment and increasing competition, managerial factors such as leadership and the application of artificial intelligence become essential elements in improving the quality and competitiveness of higher education institutions. In the last five years at that time, research may have focused more on the application of artificial intelligence in higher education. There may be research on how artificial intelligence can improve administrative efficiency, help decision-making, or even facilitate learning through adaptive systems. (Arenal et al., 2020). Recent developments that may occur are the possibility that research has evolved to measure the impact of artificial intelligence on learning and research processes, as well as exploring the potential of artificial intelligence in generating new knowledge or solutions to complex problems in a Higher Education context. (George et al., 2023).

The Higher Educations studied are limited to private Higher Educations that have a B (Very Good) Management Studies Program accredited by Badan Akreditasi Nasional Perguruan Tinggi (BAN-PT) until 2024, which is 5 Private Higher Educations in Bandung. The Higher Educations are Nurtanio University, Muhammadiyah University, STIE Ekuitas, STIE Pasundan, and STIE Dharma Negara. A B-accredited Management Studies program has a higher level of competition than a C-accredited Management Study Program and has the potential to enhance its accreditation to Excellence Accreditation. The interest of prospective students in continuing their studies in a B-accredited study program is relatively higher because it is perceived to promise a better quality of education.

## **2. Theoretical Background**

### **2.1 Competitiveness in Higher Education**

Competitiveness in the context of higher education refers to an institution's ability to maintain and enhance its position in the academic landscape through distinctive capabilities, resource advantages, and strategic positioning (Barney & Wright, 1998; Porter, 1990). In an era of intensifying geopolitical competition and technological nationalism, universities are increasingly instrumentalized as strategic assets within

national innovation ecosystems (Kaya-Kasikci, Glass, Chacon Camero, & Minaeva, 2025). The concept of "technological statecraft" in higher education demonstrates how the interplay between sovereignty concerns, regulatory philosophies, value systems, and public-private dynamics creates systematically different operating environments for universities across geopolitical contexts (Kaya-Kasikci et al., 2025).

Institutional competitiveness is no longer determined solely by traditional metrics such as research output or faculty qualifications, but increasingly by an institution's capacity to adapt to and integrate emerging technologies, particularly artificial intelligence (Bond, Khosravi, & De Laat, 2024; Teece, Pisano, & Shuen, 1997). Universities worldwide are adopting AI technologies to remain competitive and meet the evolving demands of the digital age (Bond et al., 2024). This competitive imperative is driven by multiple forces, including employers demanding graduates with AI fluency, students experimenting with AI tools, and institutions facing operational pressures to achieve more with limited resources (Ahmad, Harris, Jalil, Sandhu, Ahmad, & Alshara, 2025; Ellucian, 2024).

The competitive landscape of higher education is characterized by the emergence of value-aligned "strategic education blocs" that are replacing universal academic networks (Kaya-Kasikci et al., 2025). These researchers identify distinct governance typologies that determine higher education's role in artificial intelligence ecosystems, from talent pipelines in market-led systems to state-directed innovation hubs in centralized approaches. Such varying governance contexts shape how universities position themselves within the global AI landscape and challenge conventional internationalization frameworks in an era of technological competition (Kaya-Kasikci et al., 2025; Marginson & Rhoades, 2002).

Resource-Based Theory, as articulated by Barney (1991) and later extended by Wernerfelt (1984), provides a foundational lens for understanding competitiveness, positing that organizations achieve sustainable competitive advantage through the acquisition and deployment of valuable, rare, inimitable, and non-substitutable resources. In higher education, these resources include not only physical and financial assets but also human capital, technological capabilities, and reputational capital (Barney & Wright, 1998). When institutions develop unique AI capabilities that are difficult for competitors to replicate, they create sustainable competitive advantage that enhances their position in the academic marketplace (Teece et al., 1997).

## 2.2 Artificial Intelligence in Higher Education

Artificial Intelligence (AI) has enormous potential to make a transformative impact in multiple fields, and it has made significant strides in Higher Education by reshaping traditional administrative processes, learning, leadership, and teaching (Ahmad et al., 2025; Holmes, Bialik, & Fadel, 2019). AI technologies offer what higher education institutions have long been waiting for to revolutionize the overall educational landscape, from improving education delivery to enhancing student outcomes and streamlining administrative processes (Ahmad et al., 2025; Zawacki-Richter, Marín, Bond, & Gouverneur, 2019).

The integration of AI in higher education encompasses three key domains: academic, administrative, and leadership functions (Ahmad et al., 2025). In the academic domain, AI applications include personalized and adaptive learning systems, AI-based tutoring systems, automated grading and feedback support, and adaptive learning platforms that tailor educational content to individual student needs, learning capability levels, and adopted pace (Alharbi, 2024; Brusilovsky, 2024; Luckin, Holmes, Griffiths, & Forcier,

2016). These technologies enable more personalized and adaptive learning experiences, improving both the efficiency and effectiveness of teaching and learning processes (Alharbi, 2024; Brusilovsky, 2024).

In the administrative domain, AI streamlines processes such as admissions and enrollment, academic records management, financial aid and scholarship processing, and resource allocation (Ahmad et al., 2025; Oladele, Adeyinka, & Ajayi, 2023). By automating manual processes, AI not only improves overall efficiency but also allows staff and faculty members to focus less on mundane and monotonous tasks, thereby concentrating more on responsibilities and strategic initiatives that require focused attention (Ahmad et al., 2025). AI-driven analytics can provide educational leaders with deep insights into student performance trends, enabling more informed and timely interventions (Jiao, Ouyang, & Jiao, 2022; Herodotou, Naydenova, & Rienties, 2021).

However, the rapid integration of AI in higher education also presents significant challenges. Research on AI adoption in Chinese universities by Kaya-Kasikci et al. (2025) identifies key obstacles including lack of digital literacy and resistance to AI among faculty, resource allocation constraints, funding limitations, and concerns over data privacy and security. Ethical challenges also emerge with increased use of AI in education, including concerns regarding potential biases, privacy breaches, and data security issues (Toda, Valle, & Isotani, 2019; Grimus, 2020; Nguyen, Ngo, & Tran, 2023). These concerns are compounded by the complex ethical dilemmas involved in utilizing AI for decision-making, especially when dealing with sensitive student data (Slimi & Carballido, 2023; Zhai, Chu, & Wang, 2024; Holmes, Porayska-Pomsta, & Holstein, 2022).

Recent developments in generative AI technologies have added new dimensions to the research landscape, highlighting both opportunities and challenges, particularly in areas of assessment and academic integrity (Mao, Liu, & Zhao, 2024). The critical balance between AI support and learner autonomy in educational settings has become an increasingly important consideration for institutional leaders (Brusilovsky, 2024; Luckin et al., 2016).

### 2.3 Leadership in the AI Era

Academic leadership is crucial for integrating AI into higher education, driving adoption through strategic planning, resource allocation, and fostering innovation (Cox, 2021; Avolio, Walumbwa, & Weber, 2009). The key to unlocking the significant potential of AI is responsible strategic leadership (Ahmad et al., 2025). Strategic leadership requires aligning AI integration goals with the strategic mission of higher education institutions, fostering an environment ready to embrace innovation, and ensuring that required accountability and governance frameworks are in place for AI integration and usage (Ahmad et al., 2025; Ireland & Hitt, 1999).

Strategic leadership encompasses the ability to anticipate, envision, maintain flexibility, and empower others to create strategic change (Boal & Hooijberg, 2000). In the context of AI integration, strategic leaders must balance technological advancement with educational outcomes, ethical considerations, and resource constraints (Ahmad et al., 2025; Bearman, Ryan, & Ajjawi, 2022). They must address challenges such as resistance to change and ethical concerns—including data bias, privacy, and misconduct—while balancing technological benefits with institutional values (Bearman et al., 2022; Holmes et al., 2022; Selwyn, 2019).

A comprehensive taxonomy of AI applications in higher education leadership by Ahmad et al. (2025) identifies ten distinct domains that require leadership attention: Administrative Efficiency, Personalized Learning, Enhancing Teaching Practices, Decision-Making and Policy Formulation, Student Support Services, Organizational Leadership and Strategic Planning, Governance and Compliance, Community Engagement and Communication, Ethical AI Leadership, and Diversity, Equity, and Inclusion Initiatives. This taxonomy provides educational leaders with a structured framework for understanding, evaluating, and implementing AI solutions in their institutions (Ahmad et al., 2025).

Transformational Leadership Theory (TEL), originating from Burns (1978) and refined by Bass (1985, 1996), provides a valuable theoretical lens for understanding AI adoption in higher education. TEL encompasses four dimensions: charisma, inspirational motivation, intellectual stimulation, and individualized consideration, and has been shown to boost technology acceptance by inspiring followers and fostering innovation (Banji, 2020; Shahid, 2024). In the context of AI adoption, transformational leadership enhances the diffusion of innovation by providing vision and support (Banji, 2020). Research has linked TEL to AI adoption, emphasizing its role in motivating faculty and staff to embrace AI and align it with educational goals (Burnett, 2024; Peifer, Hagemann, & Claus, 2022).

Diffusion of Innovation Theory (DOI), developed by Rogers (2003), provides a complementary framework for understanding AI adoption in higher education. DOI outlines five stages of adoption: knowledge, persuasion, decision, implementation, and confirmation, and assesses innovation attributes such as compatibility and relative advantage (Rogers, 2003). Perceived utility has been identified as a key factor in adoption (Ghimire & Edwards, 2024; Venkatesh, Morris, Davis, & Davis, 2003). By integrating TEL and DOI, researchers can systematically examine AI-related challenges and opportunities, providing insights into how academic leaders can effectively navigate the complexities of AI adoption (Ahmad et al., 2025; Burnett, 2024).

#### 2.4 Performance in Higher Education

Performance in higher education institutions encompasses multiple dimensions, including academic outcomes, operational efficiency, research productivity, and institutional effectiveness (Cameron, 1978; Cameron & Smart, 1998). The integration of AI technologies has significant implications for performance across all these dimensions. AI enhances decision-making and strategic planning by identifying patterns and predicting trends, but success hinges on organizational readiness and ethical protocols (Kitsios & Kamariotou, 2021; Zawacki-Richter et al., 2019; Caner & Bhatti, 2020).

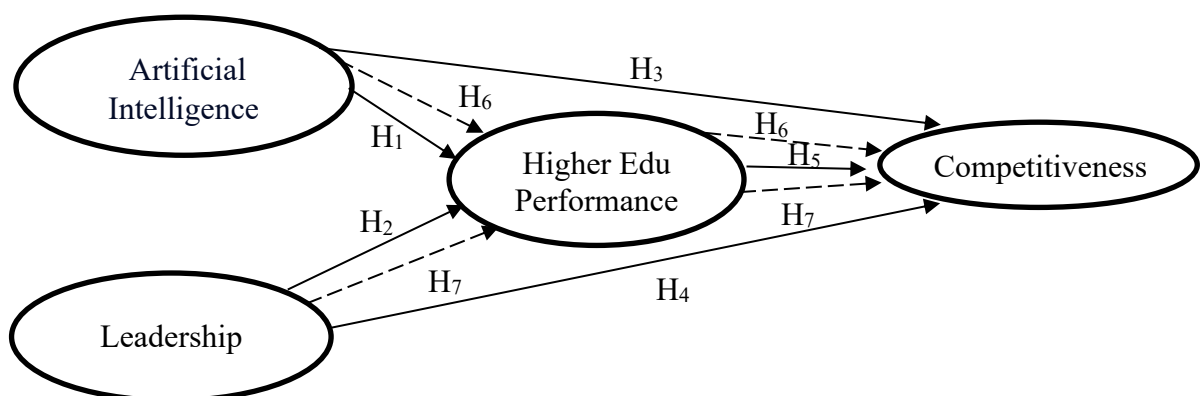
Student performance and success metrics are significantly influenced by AI integration. AI-based systems track student involvement in class activities, test results, and assignment completion, updating and monitoring performance data in real-time (Shoaib, Sayed, & Singh, 2024). AI employs predictive models to detect critical risk indicators, such as low attendance, subpar grades in required courses, or low levels of interest, that might impede student progress (Herodotou et al., 2021; Siemens & Baker, 2012). By examining these variables, teachers may proactively connect with students in higher education institutions (Herodotou et al., 2021). Data-driven interventions use performance and engagement data to suggest resources tailored to each student's needs (Sayed, Baker, & Pardos, 2023).

Institutional performance is also enhanced through AI-driven administrative efficiency (Ahmad et al., 2025). AI-driven systems handle application loads and process them in reduced time, retrieving and evaluating applicant data efficiently (Oladele et al., 2023). In student information systems, AI reduces human error and enables administrative staff to focus on higher-value activities (Ahmad et al., 2025). The automation of routine tasks through AI allows institutions to achieve more with limited resources, addressing operational pressures while maintaining or improving service quality (Ahmad et al., 2025; Ellucian, 2024).

Performance measurement in higher education increasingly incorporates AI-related metrics, including AI fluency among graduates, institutional AI readiness, and the effectiveness of AI-enhanced educational practices (Ahmad et al., 2025; Bond et al., 2024). According to Ellucian's AI Industry Report (2024), 93% of university administrators expect their use of AI at work to increase significantly through 2026. This acceleration is driven by employers demanding graduates with AI fluency, students already experimenting with AI tools, and institutions facing operational pressures to achieve more with fewer resources (Ellucian, 2024; Ahmad et al., 2025).

### 2.5 Conceptual Framework

This research has significant importance in developing an understanding of the complexity of Higher Education management in the modern era. Through the combination of concepts of leadership, artificial intelligence, and competitiveness, the research is expected to provide a more holistic and applicable perspective for Higher Education leaders in strategic decision-making. (Maulana et al., 2023). By understanding how artificial intelligence and leadership can improve the performance and competitiveness of Higher Educations, this research can contribute to better educational development, improved workforce quality, and overall economic growth. (Alshaketheep et al., 2020). Probability research has taken into account emerging new factors, such as adaptation to technological change, flexibility in providing online educational services, and the ability to produce graduates who are ready to work in an environment affected by artificial intelligence. (Dey et al., 2020). The relationship among the variables in this study is described in Figure 1:



**Figure 1.** Conceptual Framework

### 3. Methods

This study employs a quantitative approach through survey methodologies. This study used a questionnaire to examine the influence of independent variables on dependent variables in the setting of higher education, with an emphasis on aspects such as artificial

intelligence, leadership, performance, and competitiveness. The study's population consists of students from five higher education institutions in the Bandung region who are enrolled in the Management Studies Program, which is accredited B (Very Good). Each Higher Education is represented by 50 students, resulting in a total of 250 students utilizing Purposive Sampling (criteria-based sampling). The requirements in this study are students who have been sitting in the sixth semester, active students, and have used Artificial Intelligence programs at least twice, for example, Chat GPT, Microsoft Bing, Perplexity, and so forth. Data is gathered via a questionnaire with statements that measure study variables. These surveys will be built around verified indicators from past studies. The collected data will be examined with the Partial Least Squares (PLS) method. PLS is a statistical approach used to test models with a large number of variables and small to medium sample sizes. The researcher will guarantee that the questionnaire is filled out by respondents who match the criteria. Respondents will be informed of the research's goal before to data collection, and the confidentiality of the information they provide will be guaranteed. Only aggregate data will be collected, and participation is voluntary.

## 4. Results and Discussion

### 4.1 Final PLS Model

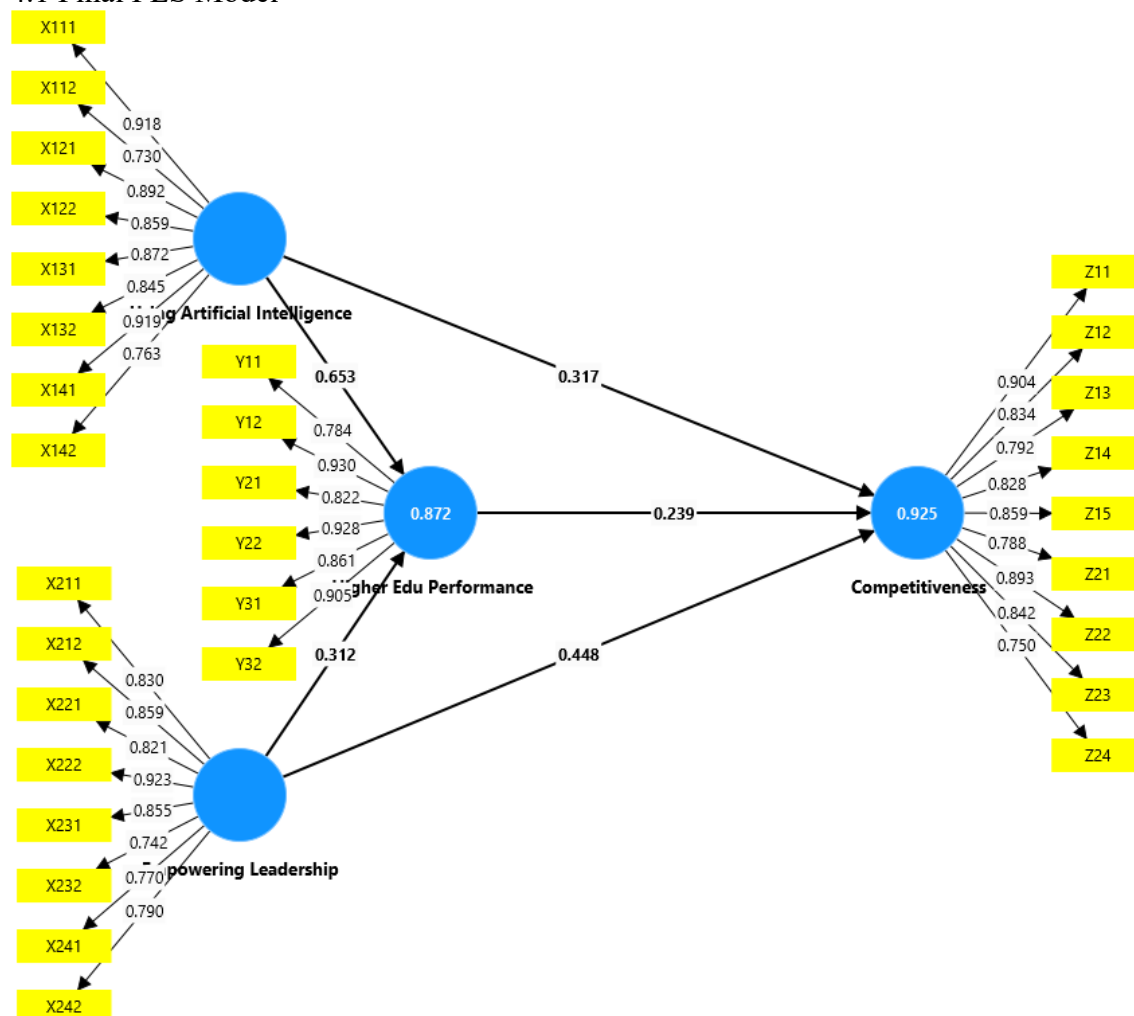


Figure 2. Final PLS Model

#### 4.2 Evaluation Model Measurement (Outer Model)

This model specifies how each indication relates to its latent variable; alternatively, the outer model can indicate the relationship between the latent variable and its indicators. External models were tested using Confirmatory Factor Analysis (CFA). Because the loading factor values are more than 0.7, all of the questionnaire's questions are considered valid, according to the evaluation results in Table 1. Furthermore, all items are regarded as dependable since the Average Variance Extracted (AVE) values are greater than 0.5, the Composite Reliability (CR) is greater than 0.7, and the Cronbach Alpha (CA) is greater than 0.7. In discriminant validity, the correlation values between indicators and their respective constructs should be higher than the correlation values with other constructs. In terms of cross-loading discriminant validity, all indicators have stronger correlations with relevant constructs than with other constructs, implying that the study model has good discriminant validity.

**Table 1.** Evaluation Results of the Outer Measurement Model

Variable	Indicator Code	Outer Loading Value	AVE	CR	CA	Information
Artificial Intelligence	X111	0.918	0.726	0.955	0.945	Valid and Reliable
	X112	0.730				Valid and Reliable
	X121	0.892				Valid and Reliable
	X122	0.859				Valid and Reliable
	X131	0.872				Valid and Reliable
	X132	0.845				Valid and Reliable
	X141	0.919				Valid and Reliable
	X142	0.763				Valid and Reliable
Leadership	X211	0.830	0.681	0.945	0.932	Valid and Reliable
	X212	0.859				Valid and Reliable
	X221	0.821				Valid and Reliable
	X222	0.923				Valid and Reliable
	X231	0.855				Valid and Reliable
	X232	0.742				Valid and Reliable
	X241	0.770				Valid and Reliable
	X242	0.790				Valid and Reliable
Higher Education Performance	Y11	0.784	0.763	0.951	0.937	Valid and Reliable
	Y12	0.930				Valid and Reliable
	Y21	0.822				Valid and Reliable
	Y22	0.928				Valid and Reliable
	Y31	0.861				Valid and Reliable
	Y32	0.905				Valid and Reliable
Competitiveness	Z11	0.904	0.694	0.953	0.944	Valid and Reliable
	Z12	0.834				Valid and Reliable
	Z13	0.792				Valid and Reliable
	Z14	0.828				Valid and Reliable
	Z15	0.859				Valid and Reliable
	Z21	0.788				Valid and Reliable
	Z22	0.893				Valid and Reliable
	Z23	0.842				Valid and Reliable
	Z24	0.750				Valid and Reliable

#### Structural Model Evaluation (Inner Model)

### 4.3 R Square Test

This model specifies the relationship between the latent variables, also known as the inner relationship. This is a type and magnitude test that measures the influence of an independent variable on a dependent variable. The test is divided into two stages: the R Square Coefficient (R<sup>2</sup>) test, which evaluates how much variance an independent variable explains in a dependent variable, and a hypothetical test, which tests the research model's premise.

### 4.4 Determination Coefficient Test / R Square (R<sup>2</sup>)

The determination coefficients are used to assess the model's internal validity. The value of the determination coefficient ranges from 0 to 1. The determination factor (R<sup>2</sup>) value is close to one. The R<sup>2</sup> score indicates how well the independent variable proposed in the equation may explain the dependent variable. Chin (1998), as described by Yamin and Kurniawan (2011), categorizes the criteria for restricting R<sup>2</sup> values as strong, moderate, or weak.

**Table 2.** R Square Results

Variable	R-square	Adjusted R-Square
Competitiveness	0.925	0.924
Higher Edu Performance	0.872	0.871

This table indicates that 92.4% (High) of the Competitiveness variables can be impacted by Artificial Intelligence, Leadership, and Higher Education Performance, whereas 7.6% is influenced by variables outside of the study. Furthermore, the R-square Adjusted Higher Education Performance is 0.871 (High), indicating that 87.1% of the Higher Education Performance factors can be influenced by the Artificial Intelligence and Leadership variables, while the remaining 12.9% is affected by other variables.

### 4.5 F Square

F-square analysis is used to identify the strong effect size of the influence of independent factors on dependent variables and the mediated variable on bound variables, with criterion of > 0.35 stated strong, 0.35 s.d > 0.15 stated moderate, and 0.15 s.d > 0.02 stated weak. (Ummat and Anindita, 2022)

**Table 3.** F Square Results

Variable	Competitiveness	Higher Edu Performance
Leadership	0.606	0.207
Higher Edu Performance	0.097	-
Artificial Intelligence	0.192	0.908

Table 3 shows that data analysis of F<sup>2</sup> on exogenous or independent constructions has the highest value of 0.907 (Strong) of the Artificial Intelligence variables versus Higher Education Performance variable, and the maximum value of 0.207 (Moderate) versus the Competitiveness of the Leadership variable.

### 4.6 Hypothesis Test

The inter-constructive hypothesis test is carried out using the bootstrap resampling method. The calculation of the hypothetical test using SmartPLS 4.1.0 can be seen from the Path Coefficient value, i.e. the t-statistical value of the relationship between the variables in the study. The decision-making method is:

- If *P-Values* > 0.05 or t counts < 1.96, then Ho is accepted and Ha is rejected.

- If *P-Values* < 0.05 or t counts > 1.96, then Ho is rejected and Ha is accepted.

**Table 4.** Path Coefficient, t-Statistics, and P-Values

Path Coefficient	Original Sample (O)	T Statistics ( O/STDEV )	P Values	Information
Direct Effect				
Artificial Intelligence -> Higher Edu Performance	0.653	11.374	0.000	Positive
Leadership -> Higher Edu Performance	0.312	5.329	0.000	Positive
Artificial Intelligence -> Competitiveness	0.317	4.412	0.000	Positive
Leadership -> Competitiveness	0.448	4.747	0.000	Positive
Higher Edu Performance -> Competitiveness	0.239	3.892	0.000	Positive

**Table 5.** Indirect Effect

Path Coefficient	Original Sample (O)	T Statistics ( O/STDEV )	P Values	Information
Indirect Effect				
Using Artificial Intelligence -> Higher Edu Performance -> Competitiveness	0.156	3.432	0.001	Positive
Empowering Leadership -> Higher Edu Performance -> Competitiveness	0.074	3.672	0.000	Positive

#### 4.7 Discussion

1) There is a significant influence of Artificial Intelligence on Higher Education Performance ( $H_1$ )

Table 4 shows that the known t statistic value of 11.374 is more than the value of t 1.96, and the P-values are less than  $\alpha = 0.05$ , indicating that Ha is accepted. The artificial intelligence variable has an impact on higher education performance. Artificial Intelligence can be used to enhance learning processes through adaptive learning systems supported. Artificial Intelligence can adapt learning materials and methods to suit the needs of each student, so that each student can learn in the way that is most effective for them. (Putri Supriadi et al., 2022). Artificial Intelligence can also help in providing automatic feedback on student tasks, allowing lecturers to focus on other aspects of teaching. (Neumann, 2022), it can analyze student academic data to detect early signs of student difficulties, so intervention can be done faster. (Marlin et al., 2023). Higher Educations need to invest in technology infrastructure that supports the implementation of artificial intelligence, including the necessary hardware, software, and networks.

2) There is a significant influence of Leadership on Higher Education Performance ( $H_2$ )

Table 4 shows that the known t statistics value of 5.329 is more than the value of t = 1.96, and the value of P-Values is 0.000, which is less than  $\alpha = 0.05$ , indicating Ha is

accepted. There is an impact of the Leadership variable on higher education performance. Visionary and innovative leaders can create an academic environment conducive to research and teaching. Besides, strong leadership can encourage faculty and staff to collaborate and share knowledge, which ultimately improves the quality of education and research. (Rathore, 2023) and effective leaders can optimize administrative and operational processes, reduce bureaucracy and increase efficiency. Good leadership can also create a positive and motivating work culture, which will increase the productivity and job satisfaction of administrative staff. (And 2021, n.d.), influence on student welfare and external relations (Siregar, 2022). What Higher Education has to do is develop leadership, improve management, and focus on student welfare. (Marlin et al., 2023)

- 3) There is a significant influence of Artificial Intelligence on Competitiveness ( $H_3$ )  
Table 4 shows that the known t statistics value of 4.412 is more than the value of t 1.96, and the value of P-Values is 0.000 less than  $\alpha = 0.05$ , indicating that the hypothesis is accepted. Competitiveness is influenced by the Artificial Intelligence variable. Artificial Intelligence has huge potential to improve the competitiveness of Higher Educations in a variety of ways. It can provide automatic and timely feedback to students, enable lecturers to focus on more strategic and creative teaching aspects, and it can adapt learning materials and methods to suit the needs of each student, improve learning effectiveness and student satisfaction. Higher Educations need to invest in technology infrastructure that supports the implementation of artificial intelligence, including the necessary hardware, software, and networks. (Alhadid et al., 2015). Teaching and administration staff need to get adequate training on the use of artificial intelligence in their daily tasks. (Mohammed Ali, 2021).
- 4) There is a significant influence of Leadership on Competitiveness ( $H_4$ )  
Table 4 shows that the known t statistics value of 4.747 is more than  $t = 1.96$ , and P-Values = 0.000 is less than  $\alpha = 0.05$ , indicating that  $H_a$  is accepted. Competitiveness is influenced by leadership variables. The coefficient result is positive (0.448), indicating that the leadership variable has a positive influence or increases the Competitiveness variable by 44.8%. Effective leadership plays an important role in formulating and communicating a clear vision and mission for Higher Education. A strong vision will motivate the entire component within the Higher Education to a common goal, improving the quality of education, research, and commitment to society, all of which contribute to competitiveness. (Hamada et al., 2023) An innovative leader will drive the improvement of academic quality by adopting new technologies, improving curriculum, and developing studies that are relevant to the needs of the industry. This will attract qualified students and enhance the reputation of the institution. (Arenal et al., 2020). It helps Higher Educations to be relevant and competitive in an ever-changing environment. (Dey et al., 2020). Higher Educations should strengthen leadership, focus on academic innovation, and develop faculty and staff. (Mohammed Alhamdi et al., 2020).
- 5) There is a significant influence of Higher Education Performance on Competitiveness ( $H_5$ )  
Table 4 demonstrates that the known t statistic value of 3.892 is larger than the value of t 1.96, and the P-values are less than  $\alpha = 0.05$ , indicating that  $H_a$  is acceptable. Higher education achievements have an impact on competitiveness. The coefficient value of 0.239 is positive, indicating that variables influencing higher education performance have a positive impact or increase competitiveness by 23.9%. The

performance of universities is one of the crucial factors affecting the competitiveness of institutions at both the national and international levels. Good performance can be measured through various indicators such as quality of teaching, research productivity, cooperation with industry, innovation, and contribution to society. (Apriliyani, 2022). This will boost the institution's reputation and make it more attractive to prospective students, thereby increasing its competitiveness. (Ritongan et al., 2018). To improve the quality of teaching, Higher Educations can improve curricula, lecturers' performance, and use innovative educational technologies. (Siregar, 2022). Scientific publications, innovations, and discoveries are important indicators of research productivity. (Rathore, 2023). Institutions can increase research productivity by providing adequate research facilities, providing incentives for researchers, and expanding research cooperation networks with industry as well as with other institutions (Kurniawaty, 2023). Institutions can engage in community dedication programs that focus on social and environmental issues, relevant to their academic expertise (Arenal et al., 2020).

- 6) There is a significant influence of Artificial Intelligence on Competitiveness through Higher Education Performance. ( $H_6$ )

Table 5 shows that the known t statistics variable of Artificial Intelligence has a value of 3.432, which is more than the value of  $t = 1.96$ . Additionally, the value of P-Values = 0.001 is less than  $\alpha = 0,05$ , indicating that  $H_a$  is accepted. Higher Education Performance shows that the Artificial Intelligence variable influences the Competitiveness variable. The coefficient result is 0.156, indicating that Artificial Intelligence factors have a 15.6% positive influence on Competitiveness through higher education performance. Thus, hypothesis  $H_6$  in this study, which states that "Using Artificial Intelligence has a significant influence on the Competitiveness variable via the Higher Education Performance variable," is accepted. Artificial Intelligence can help Higher Educations automate various administrative processes, such as student enrolment, financial management, and human resource management. With this automation, Higher Education can reduce operating costs and speed up various processes, making them more efficient. (Viscusi, 2020). It can also be used to analyze large amounts of research data faster and more accurately, thus accelerating the process of discoveries. In addition, it can help the development of innovation by predicting future research trends. (Luan et al., 2020). By adopting artificial intelligence, Higher Educations can increase their global competitiveness, as they can offer higher quality education relevant to the needs of Industry 5.0. It can boost its international reputation and attract more students, both locally and internationally. (Suwarno & Alya, 2024)

- 7) There is a significant influence of Leadership on Competitiveness through Higher Education Performance ( $H_7$ )

Table 5 shows that the leadership value of 3.672 is more than  $t = 1.96$ , and P-Values = 0.000 is less than  $\alpha = 0.05$ , indicating that  $H_a$  is accepted. Leadership has an impact on competitiveness via higher education performance. Leadership plays a crucial role in determining the performance and competitiveness of a Higher Education. Effective leadership not only contributes to the achievement of the vision and mission of the institution, but is also able to create an environment that supports innovation, collaboration, and quality improvement. In an era of globalization, Higher Educations face the challenge of continuing to compete globally in academic, research, and technological development. (Arenal et al., 2020). This strategy will help the university

achieve its main goals such as improving the quality of education, strengthening research, and building networks of international cooperation. (Putri et al., 2024). Leadership that cares about student experience will ensure that they get an education that is relevant to the needs of industry and the global job market, which in turn improves the competitiveness of graduates in the global market. (Mishra et al., 2022), investing in technology infrastructure and building closer ties with industry to ensure the relevance of education and opening up applied research opportunities. (Yustan & Kurniawaty, 2023).

## 5. Conclusion

Artificial Intelligence function makes a significant contribution to the various operational and academic aspects of Higher Education, which ultimately improves the performance of the institution. The leadership role in the implementation of artificial intelligence in Higher Education is crucial. Effective leadership will direct and facilitate the digital transformation needed to make optimal use of artificial intelligence. A combination of effective artificial intelligence applications and strong leadership will directly boost the competitiveness of Higher Educations. Artificial Intelligence and effective leadership are two key pillars that support each other in improving Higher Education performance. When artificial intelligence is used to improve efficiency, personalize learning, innovate, and be guided by visionary and inclusive leadership, the result is a significant increase in competitiveness. This synergy enables Higher Educations to compete not only in the local market but also in the global arena, making it an outstanding institution in the world of higher education.

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