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DIGITAL ECONOMY-BASED GOVERNANCE IN HIGHER EDUCATION: LEVERAGING AI AND DATA FOR IMPROVED INSTITUTIONAL PERFORMANCE

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Abstract. The digital economy has transformed the governance of higher education institutions (HEIs). Artificial intelligence, data analytics tools, and digital governance systems are becoming increasingly important elements of the university management landscape, as many institutions use them to improve decision-making processes, resource allocation, service delivery, and overall institutional performance. This study analyzes the contribution of AI- and data-driven governance to the efficiency of higher education management. The article is structured in the IMRAD format and is based on a review of academic literature and policy documents. The findings show that AI-supported governance improves operational efficiency, decision-making, student services, and strategic planning. However, issues related to data privacy, ethical considerations, governance frameworks, and digital infrastructure require careful attention. The study concludes that effective AI-based governance requires robust policies, integrated data systems, and continuous staff training.

Keywords: artificial intelligence, data-driven governance, higher education, digital economy, institutional performance, digital transformation.

Аннотация. Цифровая экономика существенно трансформирует систему управления высшими образовательными учреждениями. Технологии искусственного интеллекта, инструменты анализа данных и системы цифрового управления становятся важными элементами университетской среды, способствуя совершенствованию процессов принятия решений, распределения ресурсов, предоставления услуг и повышения общей эффективности деятельности образовательных организаций. В данном исследовании анализируется вклад управления на основе искусственного интеллекта и данных в повышение эффективности управления высшим образованием. Статья подготовлена в формате IMRAD и основана на анализе научной литературы и нормативно-правовых документов. Результаты исследования показывают, что использование искусственного интеллекта способствует повышению операционной эффективности, качества управленческих решений, уровня обслуживания студентов и эффективности стратегического планирования. Вместе с тем особого внимания требуют вопросы защиты данных, этические аспекты применения технологий, совершенствование механизмов управления и развитие цифровой инфраструктуры. Сделан вывод о том, что эффективное внедрение управления на основе искусственного интеллекта требует наличия современной нормативной базы, интегрированных систем данных и непрерывного повышения квалификации персонала.

Ключевые слова: искусственный интеллект, управление на основе данных, высшее образование, цифровая экономика, эффективность деятельности организации, цифровая трансформация.

INTRODUCTION

The digital economy has transformed the way organizations operate across various sectors, including higher education. Traditional management approaches are no longer sufficient as the only means of university governance. Instead, higher education institutions are increasingly using digital technologies, artificial intelligence (AI), and data analytics to support decision-making and improve institutional effectiveness. Digital governance enables institutions to collect, analyze, and apply data to enhance managerial decisions, transparency, and operational efficiency.

Artificial intelligence has become one of the most influential technologies in higher education. AI systems can process large volumes of data, automate administrative tasks, forecast student performance, and support strategic decision-making. According to UNESCO (2025), AI has the potential to transform education by improving teaching, learning, and institutional management, thereby contributing to more inclusive and effective educational systems.

Similarly, the Organisation for Economic Co-operation and Development (OECD) emphasizes that AI can make public institutions more productive, responsive, accountable, and capable of making decisions based on data and automation (OECD, 2025).

Governance in higher education refers to the systems and processes through which an institution is directed, managed, and monitored. Data-driven governance is an approach in which institutions use evidence gathered from institutional databases, learning management systems, student information systems, and administrative records to inform governance decisions. The integration of AI with data-driven governance can enhance efficiency, transparency, accountability, and institutional performance.

The purpose of this study is to explore the role of artificial intelligence and data-driven governance in improving governance efficiency in higher education institutions within the context of the digital economy.

LITERATURE REVIEW

The digital economy has significantly shaped the governance of higher education institutions (HEIs). By leveraging data and technology, digital governance can help universities make better decisions, increase transparency, and achieve greater operational efficiency. The OECD (2023) states that digital transformation facilitates evidence-based management and enhances institutional performance.

Artificial intelligence is one of the most significant tools in higher education management. AI-based solutions help universities streamline administrative processes, forecast student enrollment, plan resources, and monitor institutional performance. Reimers (2025) argues that AI can improve governance by supporting decision-making and strategic planning. Similarly, UNESCO (2025) notes that AI systems are increasingly used to support students, manage admissions, and improve administrative services.

Another important component of modern university management is data-driven governance. Institutional data obtained from student information systems, learning management systems, financial databases, and administrative records can be used to support decision-making. The OECD (2025) emphasizes that data analytics contributes to higher productivity, accountability, and more efficient resource utilization. Rajdhariy Rajesh (2025) also found that AI-driven analytics can improve operational efficiency and service quality.

Although these advantages are significant, several challenges remain. UNESCO (2022) and Oncioiu et al. (2025) highlight concerns related to data privacy, ethical issues, algorithmic bias, and the need for clear governance frameworks. Therefore, effective implementation requires strong digital infrastructure, institutional policies, and staff competencies.

While the use of AI and digital technologies in education has been explored in several studies, there is still limited research on the combined effect of AI, data-driven governance, and institutional performance in higher education institutions. This study aims to address this research gap.

RESEARCH METHODOLOGY

This study uses a qualitative literature review approach. Relevant academic publications, policy reports, and institutional studies published during the period 2020–2026 were analyzed. Data were obtained from UNESCO and OECD reports, peer-reviewed journals, and studies on higher education governance.

The analysis was based on three main aspects:

the use of artificial intelligence in the governance of higher education institutions;

the opportunities and challenges of data-driven decision-making;

issues related to AI-based governance systems.

The reviewed literature was analyzed and synthesized to identify common ideas, trends, and challenges in the implementation of artificial intelligence in higher education management.

ANALYSIS AND RESULTS

AI Applications in Higher Education Governance. The results reveal that artificial intelligence has begun to play a significant role in university governance and management processes. AI systems help administrators analyze institutional data, predict enrollment trends, prepare budgets, and provide better student services.

Reimers (2025) explains how AI can address the needs of educational leaders in relation to governance challenges, including limited institutional capacity, slow decision-making, inefficient resource allocation, and

insufficient use of data. Through machine learning and predictive analytics, universities can identify patterns and make more informed decisions regarding academic planning and resource management (Reimers, 2025).

AI-powered early warning systems are also being implemented in universities to identify students who are at risk of academic failure or dropping out of their programs. These systems analyze attendance, academic performance, and learning behavior in order to support timely interventions. Such predictive capabilities help increase student retention and academic success rates.

In addition, AI can streamline repetitive administrative tasks, such as admissions processing, scheduling, student inquiries, and document management. Automation allows university staff to devote more time to strategic and analytical activities.

Data-Driven Decision-Making and Institutional Performance. Studies show that effective data-driven governance has a significant impact on institutional performance. Universities generate various types of data through student information systems, learning management systems, financial databases, and research management systems.

Data analytics enables university leaders to monitor key indicators, evaluate academic programs, and allocate resources more effectively. According to the OECD (2025), AI-based data analysis improves organizational productivity by providing more accurate forecasting, better data management, and evidence-based decision-making.

Data-driven governance also improves accountability and transparency. University leaders can monitor performance indicators in real time, identify inefficiencies, and take corrective measures. This contributes to better governance and strengthens stakeholder trust.

Recent research shows that institutions implementing AI and digital governance systems benefit from increased operational efficiency, improved service quality, and better strategic management. AI technologies play an important role in enhancing institutional performance by streamlining decision-making and optimizing resource utilization, which leads to faster and more effective management outcomes (Radjabov, 2025).

Statistical Evidence and Econometric Specification. According to UNESCO data, higher education has expanded rapidly in recent years. The number of students enrolled in higher education worldwide reached 264 million in 2025, compared with 100 million in 2000 and approximately 239 million in 2020. This means that enrollment increased by 164 percent from 2000 to 2025 and by about 10.5 percent from 2020 to 2025. UNESCO also notes that the global higher education enrollment rate remains at 43 percent, highlighting unequal access to education across countries and regions.

The 2025 UNESCO survey provides important evidence on AI-related governance in higher education. Among 400 respondents from UNESCO Chairs and UNITWIN Networks, 90 percent reported using AI tools in their professional work. In addition, 19 percent stated that their institution already had a formal AI policy, while 42 percent noted that their institution was in the process of developing such a policy. Overall, this means that 61 percent of institutions had already introduced or were developing some form of policy response to AI. At the same time, one in four respondents indicated that their university had already faced ethical issues related to AI use (Table 1).

Table 1

Real published indicators supporting digital governance in higher education

Indicator	**Value**	**Source**
Higher education enrollment worldwide	264 million (2025)	UNESCO
Higher education enrollment worldwide	100 million (2000)	UNESCO
Increase in enrollment since 2000	164%	Calculated from UNESCO figures
Increase since 2020	25 million	UNESCO
Global higher education enrollment ratio	43%	UNESCO
UNESCO survey responses from higher education institutions	400 responses from 90 countries	UNESCO
Institutions using AI in professional work	90%	UNESCO
Institutions with formal AI policy or developing one	61%	UNESCO
Institutions reporting ethical AI issues	25%	UNESCO
Institutions with formal generative AI guidance in 2023	fewer than 10%	UNESCO

For comparison, UNESCO's 2023 survey revealed that less than 10 percent of schools and universities had formal guidance on the use of generative AI. The 2023 and 2025 surveys do not constitute a direct time series, as their samples differ. Nevertheless, despite these differences, the results of both surveys indicate an overall improvement in AI governance within the higher education sector.

In addition, the OECD reports that digital technologies represent an important opportunity to enhance the quality, inclusiveness, and cost-efficiency of education when institutions develop appropriate governance mechanisms, digital infrastructure, and human capacities. The OECD also emphasizes the importance of policy instruments such as digital infrastructure, system interoperability, privacy protection, and staff development for the successful implementation of digital education systems (Table 2).

Table 2
Simple econometric framework for future empirical testing

Variable	Definition	Expected sign
Institutional Performance (Y)	Student retention, graduation rate, service quality, financial efficiency	—
AI Governance (X1)	Use of AI tools, AI policy, AI-supported decision-making	Positive
Data Utilization (X2)	Use of dashboards, analytics, and evidence in decisions	Positive
Digital Infrastructure (X3)	Quality of ICT systems, connectivity, software, databases	Positive
Staff Competence (X4)	Training in AI, analytics, and digital management	Positive

A valid econometric model for future institutional data can be written as:

$$IP_{it} = \beta_0 + \beta_1 AI_{it} + \beta_2 DU_{it} + \beta_3 DI_{it} + \beta_4 SC_{it} + \varepsilon_{it}$$

The acronyms used in the model represent institutional performance (IP), AI governance (AI), data utilization (DU), digital infrastructure (DI), and staff competence (SC). This model aligns with the OECD's perspective that digital transformation is most effective when governance, infrastructure, and human capacity develop in parallel.

Once this model is estimated using actual university data, the analysis should proceed with descriptive statistics, correlation analysis, OLS or panel regression, and diagnostic tests, including tests for multicollinearity, heteroscedasticity, and autocorrelation. Dummy coefficients are not included here, as doing so would not meet proper academic standards.

AI and Strategic Institutional Development. Another important finding is the significance of AI in strategic planning. Predictive analytics is increasingly used by universities to forecast student enrollment, workforce requirements, and future academic trends.

The OECD Digital Education Outlook 2026 highlights that AI has potential beyond pedagogical applications in teaching and learning and can also support institutional planning and decision-making. AI-generated insights enable educational leaders to develop strategies that remain relevant over time and help institutions become more agile in rapidly changing environments (OECD, 2026).

Furthermore, AI enables continuous monitoring of institutional performance through real-time dashboards and analytical reports. This allows administrators to respond promptly to emerging challenges and opportunities.

The findings indicate that AI and data-driven governance can significantly enhance the efficiency of higher education management. Universities need to operate in a more efficient, responsive, and evidence-based manner in order to meet the demands of the digital economy.

The use of AI technologies contributes to these objectives by automating administrative tasks, strengthening analytical capabilities, and optimizing resource allocation. Predictive models help universities identify potential risks, improve operational efficiency, and increase student success.

However, successful implementation requires effective governance. Issues related to data privacy, algorithmic bias, transparency, and accountability have been highlighted in several studies. Universities must ensure that AI systems are implemented within ethical and legal boundaries. UNESCO supports a human-centered approach to AI implementation, emphasizing fairness, inclusion, transparency, and respect for individual rights (UNESCO, 2025).

In the field of higher education, studies on AI governance emphasize the need for transparent institutional guidelines, human oversight, and responsible use of educational data (Oncioiu et al., 2025).

The digital divide also remains a challenge. Advanced AI systems may be difficult to implement for institutions lacking sufficient technological infrastructure. Therefore, investment in digital infrastructure, staff training, and institutional capacity-building is critically important.

The results also highlight the need to maintain a balance between AI-based analysis and human decision-making. University leaders remain responsible for interpreting data, making strategic decisions, and ensuring that university governance is ethical, accountable, and aligned with institutional objectives.

CONCLUSION AND RECOMMENDATIONS

With the development of the digital economy, higher education institutions have gained new opportunities to enhance governance and institutional performance through AI and data-driven management. The results of this research confirm that AI technologies can improve operational efficiency, support evidence-based decision-making, enhance student services, and strengthen strategic planning.

Data-driven governance increases the capacity of universities to use institutional data effectively. Its application contributes to better resource allocation, greater accountability, and improved university performance. However, issues related to ethics, data privacy, transparency, and digital infrastructure must be addressed to ensure responsible implementation.

Higher education institutions should establish robust AI governance mechanisms, invest in digital infrastructure, improve data management systems, and provide continuous staff training. These measures can help universities adapt to the digital economy and improve their performance through the effective use of AI and data-driven governance.

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