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Article

Artificial Intelligence in the Economic Management of Higher Education Institutions: International Experience and Trends

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Abstract: *The aim of the study is to generalise international experience in applying artificial intelligence (AI) to the economic management of higher education institutions (HEIs) and to identify the trends relevant for Uzbekistan. The methodology combines a case-study analysis of documented institutional practices, a comparative analysis of international regulatory and policy frameworks, and a secondary analysis of Stanford HAI AI Index data. The results show that the strongest documented economic effects arise where predictive analytics is combined with organisational change – as in Georgia State University, where a randomised trial of an AI chatbot reduced "summer melt" by 21%. At the same time, AI investment is highly concentrated geographically, and regulation is shifting from voluntary principles to binding, risk-based rules. The paper concludes with recommendations for Uzbek HEIs.*

Keywords: *artificial intelligence, higher education institution, economic management, predictive analytics, international experience, EU AI Act, risk-based regulation.*

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1. Introduction

Higher education systems worldwide face simultaneous pressures: rising costs, growing enrolments, demands for accountability and intensifying competition. Artificial intelligence offers HEIs tools to forecast demand, reduce attrition, automate administration and allocate resources more precisely. According to the Stanford AI Index 2025, corporate AI investment reached USD 252.3 billion in 2024, and private investment in generative AI grew by 18.7% to USD 33.9 billion [1]. These technologies are rapidly entering university administration.

For Uzbekistan the question is practical. The Strategy for the Development of AI Technologies until 2030 sets national targets, while the higher education system has grown to 1,535.0 thousand students in the 2025/2026 academic year according to the National Statistics Committee. Uzbek HEIs therefore need to learn from international experience rather than repeat its mistakes [2]. However, most international literature on AI in higher education focuses on teaching and learning; evidence on the economic management dimension is scattered and rarely systematised.

Research hypothesis: international experience shows that the economic effect of AI in HEIs depends less on the sophistication of algorithms than on their integration with organisational processes and on the regulatory framework; therefore, the transfer of foreign practices to Uzbekistan should prioritise institutional conditions over technology acquisition [3].

G. Siemens and P. Long distinguished learning analytics, focused on learners, from academic analytics, which supports institutional and financial decision-making [4]. B. Daniel showed that big data can improve institutional efficiency but warned about data quality, privacy and organisational readiness [5]. O. Zawacki-Richter and co-authors, in a systematic review of 146 studies, found that AI research in higher education concentrated on profiling and prediction, assessment, adaptive systems and intelligent tutoring, while critical reflection on risks was rare [6].

The most rigorous evidence of economic effect comes from field experiments. L. Page and H. Gehlbach conducted a randomised controlled trial at Georgia State University, in which an AI-enabled text-messaging assistant reduced the failure of admitted students to enrol ("summer melt") by 21% and increased enrolment by 3.3 percentage points [7]. From an economic standpoint, the authors noted that the cost of the intervention was exceeded by the additional tuition revenue. S. Marginson argued that in high-participation systems institutions must manage scale and stratification simultaneously, which increases the value of data-driven management [8].

On the governance side, the OECD AI Principles, the UNESCO Recommendation on the Ethics of AI and UNESCO's guidance on generative AI in education and research established international norms, while the European Union adopted the first comprehensive binding law on AI [9]. The literature, however, rarely connects institutional cases with regulatory trends from the perspective of an emerging higher education system such as Uzbekistan's [10].

2. Materials And Methods

The study uses three methods. First, a case-study analysis of documented institutional practices was conducted, restricted to cases with published outcome data – peer-reviewed studies or official institutional reports. Second, a comparative analysis of international regulatory and policy frameworks was carried out on four criteria: legal force, approach to risk, provisions on education and implications for HEIs. Third, Stanford HAI AI Index 2025 data were used to identify global investment trends. Values not directly published were calculated from official figures and are marked as derived.

3. Results

The economic basis of AI diffusion is investment, which remains highly concentrated geographically (Figure 1).

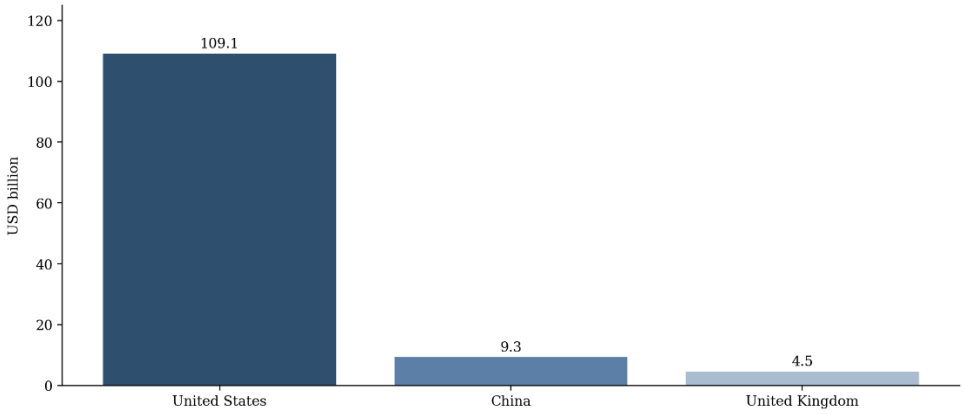


Figure 1. Private AI investment by country, 2024, USD billion

Source: compiled by the author from the Stanford HAI AI Index 2025 .

In 2024, private AI investment in the United States (USD 109.1 billion) was almost 12 times that of China and 24 times that of the United Kingdom [11]. For HEIs in emerging economies this means that AI solutions will predominantly be imported, which raises issues of cost, data sovereignty and adaptation to local languages and regulation [12].

Investment in generative AI, which underlies most new administrative tools for universities, has grown even faster (Figure 2).

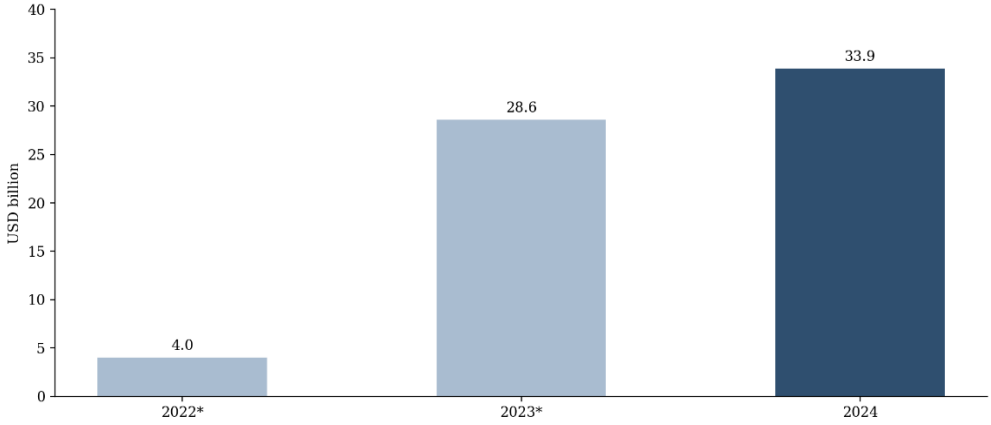


Figure 2. Global private investment in generative AI, USD billion

*Source: compiled by the author from the Stanford HAI AI Index 2025 [3]. * Derived values: 2023 = 33.9 / 1.187; 2022 = 33.9 / 8.5, based on the reported growth of 18.7% and the reported 8.5-fold increase over 2022.*

Georgia State University (GSU) is one of the most frequently cited examples of applying predictive analytics and AI to economic and student-success management (Table 1).

Table 1

Documented AI and predictive analytics initiatives at Georgia State University

Initiative	Content	Documented outcome
GPS Advising (launched 2012)	Predictive analytics on 10 years of student data; about 800 risk indicators; nightly updates and alerts to advisers	More than 200,000 adviser interventions prompted by the system; six-year graduation rate rose from 48% (2008) to 55% (2018)
Pounce AI chatbot (RCT, 2016)	Text-based AI assistant guiding about 7,000 admitted students through enrolment tasks; half assigned to treatment	Summer melt reduced by 21%; enrolment up by 3.3 percentage points; cost of intervention exceeded by additional tuition revenue
Organisational complement	Additional advisers hired; small completion grants for students with modest unpaid balances	Alerts converted into real human contact; financial barriers to completion reduced

Source: compiled by the author from.

The GSU case confirms the hypothesis: the algorithm itself was only part of the solution. The economic effect – retained tuition revenue and reduced cost per graduate – was achieved because predictive alerts were linked to added advising capacity and targeted micro-grants [13]. For Uzbek HEIs, where tuition-based (contract) revenue is significant, the most transferable lesson concerns retention: every student who does not drop out preserves contract revenue for the remaining years of study [14].

The second major trend is the shift from voluntary principles to binding, risk-based regulation (Table 2).

Table 2

International frameworks governing AI in education

Framework	Legal force	Approach	Implications for HEI

			economic management
OECD AI Principles (2019, updated 2024)	Recommendation	Values-based principles: transparency, robustness, accountability	Basis for internal AI policies and model documentation
UNESCO Recommendation on the Ethics of AI (2021)	Recommendation adopted by member states	Human rights, proportionality, human oversight	Human-in-the-loop for decisions affecting students and staff
UNESCO Guidance for generative AI in education and research (2023)	Guidance	Institutional policies, age limits, validation of tools	Need for institutional generative AI policies
EU Artificial Intelligence Act, Regulation (EU) 2024/1689	Binding regulation	Risk-based; AI in admission, assessment and monitoring of students classified as high-risk	Conformity assessment, documentation and human oversight duties for high-risk systems
Uzbekistan: PQ-358 (2024) and Law O'RQ-1115 (2026)	Strategy; binding law	Development targets; definition of AI; ban on legally significant decisions on rights based solely on AI	Decisions on grants, fees and staffing must retain human review

Source: compiled by the author from .

4. Discussion

The comparison shows convergence: all frameworks require human oversight, transparency and accountability, but only the EU AI Act and Uzbekistan's Law O'RQ-1115 impose binding obligations [15]. Under the EU AI Act, AI systems used to determine access or admission to education, evaluate learning outcomes or monitor students are high-risk. In Uzbekistan, the amendments introduced by Law O'RQ-1115 prohibit making legally significant decisions affecting human rights solely on the basis of AI [16]. For HEI economic management this means that AI tools for admission planning, pricing or grant allocation must be designed as decision-support systems rather than automated decision-makers [17].

A third trend is the gap between the speed of adoption and institutional readiness [18]. A UNESCO survey of over 450 schools and universities in 2023 found that fewer than 10% had formal guidance on generative AI, even as student use grew rapidly. Institutions that lack policies face both academic and financial risks, including devaluation of assessment and unplanned spending on tools [19].

5. Conclusion

The study yields three conclusions. First, AI investment is highly concentrated, so HEIs in Uzbekistan will mostly adopt imported solutions and must manage the associated costs and dependencies. Second, documented economic effects of AI in HEIs arise from the combination of predictive tools with organisational and financial measures, as the Georgia State University case demonstrates. Third, regulation is moving towards binding, risk-based rules that require human oversight in decisions affecting students. The hypothesis is confirmed.

Recommendations for Uzbek HEIs:

1) Begin with retention-focused predictive analytics, linking risk alerts to advising capacity and targeted financial support, since retained students preserve contract revenue.

2) Pilot AI assistants in admission and enrolment processes using randomised or quasi-experimental designs so that economic effects can be measured rather than assumed.

3) Classify institutional AI use cases by risk level, applying documentation and human-oversight requirements consistent with Law O'RQ-1115 and comparable to the EU high-risk regime.

4) Adopt institutional generative AI policies and include AI tool costs in medium-term financial planning.

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