DOI:10.59787/2413-5488-2026-54-2-6-22

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GLOBAL TRENDS IN THE INTRODUCTION OF AI (ARTIFICIAL INTELLIGENCE) IN HIGHER EDUCATION: COMPARATIVE AND SOCIOLOGICAL ANALYSIS

Abstract. The article presents a comparative sociological analysis of global trends in the introduction of artificial intelligence (AI) in higher education programs in journalism. Political initiatives from different regions, the level of accessibility of artificial intelligence technologies and digital inequality, ethical aspects of the use of artificial intelligence in teaching, as well as pedagogical practices and platforms used to teach journalism through artificial intelligence are considered. The study relies on relevant scientific literature, international reports and statistics as of 2020. General trends have been identified-the desire to provide graduates with skills in working with AI and the integration of AI tools into the educational process – in the face of significant differences between regions (Kazakhstan, Europe, USA, China, Japan) in public policy, resource provision and regulatory and ethical approaches. Conclusions were drawn about how the specific conditions of each region affect the introduction of AI in the knowledge of journalists, recommendations were proposed to take into account best practices and overcome digital inequality.

Keywords: artificial intelligence, journalistic Education, Higher Education, digital transformation, ethical aspects, comparative analysis.

Introduction

The rapid development of artificial intelligence technologies in recent years has significantly affected the higher education system worldwide. Universities are revising curricula, including courses on working with AI and using data, to prepare students for the digital economy of the future.These changes are particularly noticeable in the fields of media communications and journalism, where AI technologies are already transforming professional practice, from automated news generation to data mining and content personalization. In this regard, an urgent scientific task is to study global trends in the introduction of AI into educational programs in journalism and compare the experience of different regions (Babacan et. al., 2025).

The relevance of research. The integration of AI into education has become particularly relevant after 2020, when, on the one hand, machine learning and natural language processing technologies (including large language models like GPT) reached a new level of maturity (Babacan et. al., 2025)

and on the other, the COVID 19 pandemic stimulated a massive transition to digital learning formats. National AI development strategies have emerged in many countries, which also affect education (Schiff, 2022)

The analysis of scientific publications from 2020-2025 allows us to identify several areas of research in the field of AI and higher education. The first group of papers (Kasneci et al., 2023; Jin et al., 2024) focuses on the pedagogical potential of generative models and their impact on academic integrity and personalization of learning. The second group (Schiff, 2022; European Commission, 2022) analyzes national training strategies for the AI economy. The third group of studies examines the transformation of journalism as a profession in the context of automation (Tejedor et al., 2024; Babacan et al., 2025).

At the same time, a systematic comparative sociological analysis of the introduction of AI specifically into journalism education in different political and cultural contexts is presented in fragments. Existing research lacks an integrative model that allows comparing government policy, infrastructural conditions, regulatory and ethical framework, and pedagogical practices in a single analytical framework.

Thus, the research gap lies in the lack of elaboration of a comparative sociological approach to the

analysis of the integration of AI into journalism education.

The purpose of the study is to develop a comparative sociological model for analyzing the introduction of artificial intelligence in journalism education and to identify regional differences in strategies, institutional conditions, and pedagogical practices.

To achieve the goal, the following tasks are set:

1) To analyze modern scientific approaches to the study of AI in education.
2) Compare the government strategies for the introduction of AI in higher education in Kazakhstan, the EU, the USA, China and Japan.
3) Assess the infrastructural readiness of the regions (Internet penetration, prevalence of AI programs).
4) Analyze the regulatory and ethical framework for the use of AI.
5) Compare pedagogical practices of integrating AI into journalism programs.

The scientific novelty of the research lies in the development of a comparative sociological approach to the analysis of the introduction of artificial intelligence in journalism education. The work takes into account the political, infrastructural, ethical and pedagogical aspects of digital transformation.

The paper also offers an original model of comparative analysis of Kazakhstan with the world's leading regions within the framework of a single analytical model. This ensured comparability of the data and increased the validity of the conclusions. The analysis revealed a connection between the model of public education management and the nature of the introduction of AI. The results obtained clarify the understanding of the factors of digital reforms in the higher education system and expand the theoretical understanding of this problem.

Literature Review

Recent scholarship shows a clear shift from “classic” educational AI applications (e.g., adaptive systems, learning analytics, administrative automation) toward generative AI and large language models as a new layer of higher-education infrastructure. While optimistic accounts emphasize personalization and productivity, the more careful strand of research stresses that educational value depends on pedagogical design, learner agency, and institutional governance rather than tool availability alone. Evidence from experimental syntheses suggests that ChatGPT-based interventions can improve performance and higher-order thinking indicators, but results are highly sensitive to research design choices (e.g., short-term effects, assessment type, lack of power analysis), which limits the validity of broad claims about “transforming education” without specifying conditions. Together, these findings motivate a literature review that treats AI not as a single innovation, but as a bundle of socio-technical practices whose effects vary across contexts and disciplines (Vincent-Lancrin & R. van der Vlies, 2020)

Many countries have adopted national strategies for the development of AI, which set the framework for the field of education. For example, in the European Union, the digital transformation of education is enshrined in the EU's Digital Education Plan 2021-2027, and in 2022 the European Commission issued special ethical guidelines on the use of AI and data in education for teachers. These guides aim to debunk popular misconceptions about AI, explain the risks and benefits of technology for schools, and provide practical advice on the ethical and effective use of AI in the classroom. In addition to soft regulation, Europe is moving towards legislating the use of AI: within the framework of the upcoming EU Artificial Intelligence Act (AI Act), AI systems used in education (for example, to assess academic performance or select students) are classified as high-risk and will have to meet strict requirements for transparency, reliability and non-directional discrimination (European Commission, 2022)

The European agenda focuses on ensuring trust in AI in education and preventing potential harm (violation of student privacy, increased algorithm bias, etc.).

There is no single national program for introducing AI into education in the United States, but significant efforts are being made at the state level in line with federal recommendations and by individual universities. In 2023, the Office of Educational Technology of the US Department of Education (OET) published the report "Artificial Intelligence and the Future of Teaching and Learning", which outlined the principles of responsible AI implementation. Among the priorities are: centering the role of the teacher (a person in a crucial role is “human–in-the-loop”), ensuring equal access and taking into account the principles of fairness, guaranteeing the security of student data, transparency of algorithms and their accountability to teachers.

The report emphasizes that interest in AI among American educators is growing rapidly – teachers are increasingly experimenting with new tools (from voice assistants to text generation tools) and at the same time are aware of the risks associated with them (U.S. Department of Education, Office of Educational Technology, 2023)

In Japan, generative artificial intelligence is also becoming the subject of active discussion in higher education. The analytical review shows that in 2023, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) published an official guide on accounting for generative AI in universities and technical colleges, aimed at supporting educational institutions in effectively integrating AI technologies and managing associated risks. The reaction of universities includes the development of their own recommendations and frameworks: for example, Osaka University has prepared comprehensive guidelines on the use of generative AI, including basic educational programs, teacher support and attention to ethical issues, reflecting the desire to combine technological innovation with academic values (Enkhtur & Li, n.d.)

Thus, generative AI should be interpreted not as a homogeneous technological breakthrough but as a socio-technical phenomenon embedded in regulatory frameworks, institutional cultures and disciplinary contexts. The literature increasingly emphasizes that the impact of AI differs significantly depending on governance models, ethical safeguards and the degree of integration into curricula.

Government policy plays a key role in the development of artificial intelligence in China. Within the framework of the "Strategy for the Development of Next-generation Artificial Intelligence" (2017), education is considered as a strategic tool for building national human resources and strengthening the country's technological leadership.

As noted by Fu and Ji (2024), the Chinese model of training AI specialists is based on close cooperation between the state and universities in the format of the so-called "triple helix" (state – university – industry). Government agencies not only form the regulatory framework and strategic guidelines, but also actively encourage universities to open new educational programs on AI, create research centers and introduce specialized disciplines into curricula.

As a result, there is an accelerated institutional development of AI trends in higher education, reflecting the centralized nature of China's educational policy and its close relationship with national technological priorities (Fu & Ji, 2024)

Such an impressive large-scale government campaign in the educational field is accompanied by major investments in infrastructure (AI research centers, supercomputing facilities are being created) and support for private EdTech initiatives. In particular, adaptive AI-based learning platforms for schoolchildren are actively developing in China China has also witnessed the rapid development of AI-driven adaptive learning platforms, supported by strong state industry collaboration and large-scale educational data ecosystems (Huang & Gadavanij, 2025).

A key factor in the success of AI implementation in modern education is the access of educational institutions, teachers and students to modern technologies. There is a gap both between rich and poor countries, and within countries, between resourced universities and others. According to the International Telecommunication Union (ITU), in 2023, an average of 79% of young people (aged 15-24) globally used the Internet, compared to just 65% of individuals over the age of 24 used it. In highly and medium-developed countries, the level of youth connectivity is already close to universal (over 95%), while in low–income countries there remains a significant gap - young people there are almost twice as likely to have access to the network as other groups of the population (International Telecommunication Union, 2023). For higher education, this means that new applicants, as a rule (which is natural), are much more literate in the digital issue of previous generations, but there remains unevenness in the basic digital infrastructure between countries and regions.

Digital inequality also manifests itself in another dimension the availability of advanced AI tools and knowledge about them. For example, the world's leading universities have the opportunity to attract expensive commercial AI-based solutions and develop their own experimental systems, while less affluent universities depend on publicly available or free resources. At the same time, the proliferation of open online platforms and MOOCs (massive open online courses) with AI elements somewhat smooths this problem, enabling students from different countries to gain access to best practices. The research literature emphasizes that without targeted measures, the gap can widen: elite institutions are rapidly implementing AI to improve

the quality of education, while peripheral ones may lag even further behind (Jin et. al., 2024). Therefore, many international organizations (UNESCO, the World Bank, etc.) are calling for the integration of the principle of accessibility in the digital transformation of education providing schools and universities with the necessary infrastructure, training personnel, localization of AI systems for different languages and contexts, subsidizing access for vulnerable groups. For example, the Republic of Kazakhstan, claiming to be a regional digital hub, is investing heavily in infrastructure development: data centers are being built, and by 2027 it was planned to increase Internet coverage to 100% of settlements, which creates the foundation for the introduction of AI tools throughout the country (Official website of the Prime Minister of the Republic of Kazakhstan, 2025).

In general, overcoming digital inequality is seen as a necessary condition for the successful integration of AI into education, otherwise new technologies and digital innovations will only strengthen existing social and economic differences and the gap between countries.

Importantly, digital inequality extends beyond basic internet connectivity. A second-order digital divide is emerging in relation to access to advanced AI systems, computational resources, high-quality datasets and institutional expertise. Even in contexts with high internet penetration, unequal access to premium AI tools and technical infrastructure may stratify learning opportunities and reinforce academic hierarchies. Without coordinated policy intervention, the integration of AI risks amplifying existing structural inequalities within and between higher education systems.

With the increasing use of AI in the educational process, a set of ethical issues arises that are widely discussed in the literature (U.S. Department of Education, Office of Educational Technology, 2023).

The debate on academic integrity intensified following the public release of Chat GPT in late 2022. Early institutional responses included restrictive or precautionary measures, such as temporary bans and modifications to grading policies. However, subsequent discussions increasingly emphasized the development of balanced regulatory frameworks that permit the use of generative AI under clearly defined conditions, including mandatory disclosure requirements, transparent attribution practices, and revised assessment strategies designed to preserve academic standards (Bittle & El-Gayar, 2025).

Secondly, data privacy. AI systems (for example, adaptive platforms or learning analytics) collect large amounts of data on students' academic performance and behavioral patterns. The task is to ensure reliable protection of this data and transparency of how it is processed in order to prevent violations of confidentiality or discrimination based on hidden grounds. European documents explicitly emphasize the need to comply with GDPR and other standards when implementing AI in education (European Commission, 2022; European Commission, n.d.-a).

Thirdly, the bias and fairness of algorithms: if AI is used to select applicants or evaluate papers, it is necessary to ensure that there is no built-in bias (for example, on linguistic, gender, or cultural grounds) (Schiff, 2022)

Fourth, the role of the teacher and trust. An ethical dilemma arises: how much can one rely on recommendations generated by AI (whether it's evaluating an essay or choosing a learning route), and how does this affect the teacher's role? The concept of “Human-in-the-loop” suggests that AI solutions should be considered only as auxiliary, and the final word remains with the teacher (U.S. Department of Education, Office of Educational Technology, 2023). This is necessary in order to maintain pedagogical responsibility and avoid situations where an opaque algorithm categorically determines the student's academic fate.

At the same time, empirical research on generative AI and academic integrity remains methodologically fragmented. Many studies rely on perception surveys, institutional guideline analysis or short-term experimental interventions, while longitudinal evidence on learning outcomes and equity effects is still limited. As a result, public debates about risks and benefits often outpace robust causal evidence, complicating cross-regional comparison and systematic evaluation.

In parallel with politics and ethics, researchers analyze specific practices of using AI in the educational process. Works on pedagogy highlight the potential of Intelligent Teaching Systems (ITS) to personalize student learning. Even before the current wave of generative AI, numerous studies have demonstrated the effectiveness of ITS in various disciplines – from mathematics to language learning – by adapting the complexity of tasks to the student's level and providing instant feedback. Such tools are also emerging in journalism education: for example, systems that help students practice the skills of writing news articles with

automatic indication of stylistic errors or deviations from the structure of the news. Another class of practices is automated assessment systems (for example, algorithmic assessment of essays). Until recently, their accuracy left much to be desired, but with the improvement of language processing models, they are beginning to be used to relieve teachers when reviewing large amounts of work. At the same time, as Kasneci et al. point out. (2023), new large language models open up other possibilities: personalized assistants for students who are able to explain the material and answer questions in an interactive mode (Babacan et. al., 2025; Kasneci et al., 2023). Such approaches are beginning to be reflected in the practices of Kazakhstani universities. So, in 2025 at the private university "Q University" (Almaty) A seminar was held for journalism students on the topic "Journalism and Media in the age of AI", where cases of using neural networks in the media sphere and future skills required from graduates were discussed (Kazakh university, n.d.). Thus, the process of adapting pedagogical approaches is underway everywhere: from purely lecture-based learning towards a more interactive, project-based approach using digital platforms.

Although international literature provides substantial normative guidance and an expanding body of empirical findings, cross-regional comparisons remain analytically inconsistent. Studies rarely apply shared indicators encompassing governance structures, accessibility conditions, ethical safeguards and pedagogical adaptation. Consequently, it remains difficult to explain how socio-political contexts shape AI implementation in journalism-oriented higher education across different regions.

Therefore, the present study seeks to develop a comparative sociological framework for analyzing AI integration in higher education across Kazakhstan, the European Union, the United States, China and Japan, with particular attention to governance models, infrastructural capacity, ethical regulation and curricular adaptation in journalism-oriented programs.

Research methods and organization

To achieve these goals, a strategy of comparative sociological analysis was used, combining qualitative and quantitative methods. The object of the analysis is the process of introducing AI into journalism education programs in higher education, and the subject is its features in various socio-cultural and institutional contexts (Kazakhstan, Europe, USA, China, Japan).

The research is interdisciplinary in nature and is based on the following methods: (1) analysis of documents and literature, national strategies and programs have been studied (for example, the concept of AI development in Kazakhstan until 2029, the EU Digital Education Action Plan, reports of the US Department of Education, etc.). (2) Integrated comparative case analysis, each of The five selected regions was treated as a separate case, after which they are compared according to uniform parameters. (3) Secondary analysis of statistical data international indicators are used (the level of Internet penetration, investments in AI, the number of educational programs on AI, etc.), as well as survey and research data reflecting the perception of AI by students and teachers. These quantitative data are used to illustrate similarities and differences between regions.

It should be noted that direct measurement of the degree of AI implementation in educational programs is a complex task, since qualitative changes are not always reflected by quantitative metrics. Therefore, within the framework of the methodology, it was decided to rely on expert assessments and indirect indicators (availability of strategies, examples of implemented courses, evidence from the literature), taking into account the limitations of each individual indicator. The comparative sociological approach made it possible to take into account a wide socio-cultural context: the regulatory framework, economic conditions, public expectations, and the level of digital literacy, and correlate them with the observed practices of using AI in the education of journalists.

To enhance the analytical rigor of the comparative framework, this study introduces a structured composite indicator the AI Integration Index (AIII). The index serves as an operational tool for assessing the degree of institutional integration of artificial intelligence in journalism education across different regional contexts.

The development of AIII is grounded in internationally recognized policy and governance frameworks, including the European Commission’s Digital Education Action Plan (2021-2027) and Ethical Guidelines on the Use of Artificial Intelligence in Education (European Commission, 2022), the U.S. Department of Education’s report Artificial Intelligence and the Future of Teaching and Learning (2023),

national AI strategies analyzed in comparative policy research (Schiff, 2022), infrastructural indicators provided by the International Telecommunication Union (ITU, 2023), and the state–university–industry cooperation model described in the Chinese context (Fu & Ji, 2024).

Conceptual Dimensions

The index consists of four analytically distinct dimensions reflecting the multidimensional nature of AI integration in higher education:

1) Public Policy and Strategic Commitment (P). Presence of national AI strategies, regulatory acts, measurable implementation targets, and institutional coordination mechanisms.
2) Technological and Infrastructural Readiness (T). Internet penetration rates, institutional access to AI platforms, computational infrastructure, and systemic digital investment.
3) Ethical and Regulatory Framework (E). Existence of formal AI ethics guidelines, academic integrity policies related to generative AI, data protection standards, and adherence to "human-in-the-loop" principles.
4) Curricular and Pedagogical Integration (C). Inclusion of AI-related courses in journalism programs, integration of data journalism modules, intelligent tutoring systems, AI-assisted assessment, and faculty training initiatives.

Scoring Procedure

Each dimension is evaluated on a five-point ordinal scale:

1 - Minimal or declarative presence
2 - Fragmented and experimental initiatives
3 - Structured but limited implementation
4 - Coordinated and systemic integration
5 - Advanced, institutionalized, and scalable integration

Scores are assigned based on documented policy documents, statistical indicators, and peer-reviewed academic sources referenced in this study.

The composite index is calculated as:

$$AIII = \frac{P + T + E + C}{4}$$

where P, T, E, and C represent the respective dimension scores.

This balanced approach reflects the sociological premise that AI integration is a multidimensional institutional transformation rather than a purely technological process.

The application of the index is presented in the Results section.

The analysis was carried out in stages. At the first stage, a reference profile was compiled for each region, including: an overview of government policy in the field of AI and education, current initiatives at universities, problems noted in the literature (for example, resistance from teachers, lack of resources, ethical dilemmas), examples of specific journalism programs or faculties implementing AI. In the second stage, all five profiles were compared according to the specified categories. The matrix mapping technique was used: the data weresummarized in a table, where the analysis categories (politics, accessibility, ethics, pedagogy) were arranged along the rows, and the regions were arranged along the columns. A fragment of the summary table is presented in the "Results" section. At the final stage, the interpretation of the comparative data obtained from the standpoint of the sociology of education was carried out: historical, cultural, and economic differences affecting the perception and implementation of AI were taken into account.

The limitations of the study are related, firstly, to the fact that the available data may not fully reflect the actual practice on the ground (especially if changes have occurred recently, the literature may be late). Secondly, the focus on journalism education narrows the field of analysis – the conclusions apply mainly to this field and related humanities specialties, although many trends are typical for other disciplines. Nevertheless, the chosen methodological approach provides a sufficiently broad and reliable overview to identify key global trends and regional specifics.

The results of the study and their discussion

The results are presented in two stages: first, brief characteristics of each of the regions under consideration are given in terms of the introduction of AI in higher education (especially in the field of journalism), then summarized in a comparative table.

To complement the qualitative comparison presented above, the AI Integration Index (AIII) was applied to the five regions under consideration.

Table 1.

AI Integration Index (AIII) Scores by Region

Region	Policy (P)	Technology (T)	Ethics (E)	Curriculum (C)	AIII Score
Kazakhstan	4	3	3	3	3.25
European Union	4	4	5	4	4.25
USA	3	4	4	4	3.75
China	5	4	3	5	4.25
Japan	4	4	4	3	3.75

The index reveals differentiated models of AI integration rather than linear developmental hierarchies. China demonstrates the highest level of centralized strategic mobilization (P = 5) and large-scale curricular expansion (C = 5), reflecting its state-driven model of coordinated AI development and institutional scaling. However, ethical governance remains embedded primarily within national regulatory discourse rather than decentralized institutional frameworks, which explains its moderate ethical score (E = 3).

The European Union combines a strong regulatory architecture (E = 5), supported by the AI Act and ethical guidelines, with high infrastructural readiness and systematic curricular reforms. Its integration model is characterized by normative consolidation and regulatory coherence.

The United States exhibits strong technological capacity and innovative pedagogical practices (T = 4; C = 4), but the absence of centralized coordination results in a moderate policy score (P = 3), reflecting a decentralized bottom-up model.

Japan represents a hybrid approach, balancing state guidance with university autonomy. While technological readiness is high, curricular integration progresses cautiously, consistent with Japan’s incremental innovation culture.

Kazakhstan demonstrates proactive strategic commitment (P = 4) with ambitious targets for AI integration. However, infrastructural capacity and pedagogical implementation remain in a developmental phase, which explains the composite score of 3.25. The results suggest a transitional model characterized by policy acceleration and gradual institutional adaptation Kazakhstan. In recent years, Kazakhstan has demonstrated high activity in promoting AI at the state level. In 2024, the Government of the Republic of Kazakhstan adopted a Concept for the development of artificial intelligence until 2029, which provides for the formation of a full-fledged AI ecosystem in the country and accelerated technology adoption in all sectors, including education (Government of the Republic of Kazakhstan, 2024). The identical composite scores of China and the European Union do not indicate institutional similarity, but rather reflect different pathways toward high-level integration centralized mobilization in China and regulatory-normative consolidation in the European context.

Separately, Kazakhstan relies on international cooperation and the involvement of expertise. Partnerships have been concluded with major global companies, for example, Google Corporation in 2023-24 helped launch courses on generative AI for students of 15 Kazakhstani universities, reaching ~12 thousand students (Sakenova, 2024).

The availability of technology in Kazakhstani universities is gradually increasing thanks to government projects on the digitalization of education. According to official data, 92.9% of the country's population is using the Internet by 2023 (Trading Economics, n.d.) and large universities have established competence centers in the field of AI and big data.

The ethical aspects of the use of artificial intelligence (AI) in Kazakhstan are beginning to receive increasing attention at both the state and academic levels. One of the key steps was the approval in 2024 of

the Concept for the Development of Artificial Intelligence until 2029, which specifically emphasizes the importance of observing moral and legal norms in the implementation of AI. The concept involves the development of ethical standards that take into account national cultural and spiritual values and are aimed at protecting human rights, non-discrimination and ensuring justice in the process of digital transformation (Digital Rights, 2024). In general, the ethical policy at the university level is still being formed. Some include warnings about the prohibition of unjustified use of generative AI in educational work, but there are no uniform rules. However, awareness-raising activities are underway: for example, in 2023, Satbayev University hosted a seminar of the Ministry of Education and Science of the Republic of Kazakhstan on the ethics of AI application in education (Ministry of Science and Higher Education of the Republic of Kazakhstan, 2025).

As for pedagogical practices, Kazakhstani universities are at the beginning of the path of AI integration. New educational programs are being formed: in 2022, Astana IT University launched the bachelor's degree program "Digital Journalism" with the study of AI tools (Astana IT University, n.d.). Journalism teachers are being retrained in the use of digital tools. Nevertheless, traditional teaching methods still prevail, and one of the tasks is to prepare the teaching staff for the use of AI in the classroom. Extracurricular activities are organized for journalism students: media technology hackathons, meetings with practitioners using AI in the media. Table 1 provides a summary for Kazakhstan along with data for other regions.

Europe (the European Union and European countries). The European experience of introducing AI into higher education is characterized by a balance between innovation and regulatory measures. EU policy sets the general direction: the digital transformation of education is considered as part of the implementation of the concept of "Europe in the Digital age". At the supranational level, the aforementioned Digital Education Action Plan 2021-2027, the Horizon Europe initiative with funding for EdTech and AI research, and draft ethical standards have been prepared. Many EU countries have developed their own AI strategies, which also reflect educational aspects. For example, back in 2018, France noted in the Villani Report strategy the need to introduce AI courses at all universities and create centers of excellence in this field; Germany, as part of the KI-Campus program, funds an online platform for teaching AI to both students and the general public. In the Scandinavian countries (Finland, Estonia), national programs have been implemented to teach the basics of AI (free online courses such as Elements of AI), which have reached hundreds of thousands of citizens, this increases the overall level of literacy, including among students of humanities. Thus, Europe's strategic focus is on massively increasing AI literacy and training, while simultaneously developing AI research in education and introducing standards for safe use (European Commission, n.d.-b; European Commission, n.d.-c; European Commission, n.d.-d; KI-Campus, n.d.; Reaktor & University of Helsinki, n.d.)

The availability of technology in European universities is generally high, especially in Western Europe. In the field of journalism, European universities often cooperate with the media industry: the BBC, Reuters, Deutsche Welle and other major media participate in educational projects (for example, joint courses, internships), bringing their best practices in the field of media technology, including AI, to universities. As a result, journalism students in Europe often have the opportunity to work with cutting-edge tools, whether it's analyzing big data for investigative journalism or using algorithms to monitor social media.

In Europe, issues of AI ethics in education are being addressed at the institutional and national levels, with an emphasis on transparency and security. In addition to the pan-European principles, ethical committees are being established at the university level, and guidelines on the use of AI are being issued.

Teaching practices in European journalism schools are very diverse. Many universities are revising their curricula: they are introducing new courses (for example, "Algorithms and Automation in Media", "Data for Journalists"), updating existing disciplines ("Multimedia Journalism" now includes work with neural network tools for creating content, etc.). The example of Spain described in the Tejedoretal study is illustrative. (2024): After analyzing the curricula of 37 journalism faculties, the authors found that over the past 5 years there has been a significant increase in the number of subjects related to AI and big data (Tejedor et. al., 2024)

Similar processes are underway in Italy, Germany, and the Scandinavian countries. European teachers

are actively involved in international projects on innovation in education: for example, the Erasmus+ program implements online courses on data journalism with the participation of universities from different countries, which use online platforms and AI modules for data analysis.

USA. Higher education in the United States is characterized by decentralization, so the introduction of AI depends on the initiatives of specific universities and states. The policy at the national level is advisory in nature. However, in 2022-2023, AI issues in education have firmly entered the agenda of national pedagogical associations and accreditation bodies. In 2023, the Association of Universities and Colleges (ACE) issued a statement calling on universities to adapt their rules to the era of AI and share practices that enhance the quality of education. Some states are promoting legislative initiatives: for example, California is discussing funding programs to develop open AI tools for public universities to compete with commercial ones. But still, the main drivers are the universities themselves, especially the large and wealthy ones.

The leading universities in the United States have high-tech infrastructure, although the level of equipment varies between large universities and less well-funded colleges.

Ethical and regulatory aspects in American universities are addressed through the updating of internal codes. Universities include provisions on the inadmissibility of presenting someone else's (including machine) work as their own, in fact, expanding the concept of plagiarism to cases of AI generation. Interestingly, some universities (such as the University of Michigan) have officially allowed the use of AI, provided they specify which tools were used and how, thereby incorporating transparency. At the same time, difficulties were discovered: AI text detection tools (for example, GPTZero) turned out to be unreliable, which gave rise to a discussion about the presumption of innocence of students. Courses on professional ethics and algorithmic transparency are widely available in American journalism schools. Modules on algorithmic ethics are now being added there: cases where news algorithms have led to distortions (as in the case of the Facebook news feed scandals) are being considered, and the role of a journalist in correcting such situations is discussed.

Teaching practices in the United States are very diverse, from traditional to innovative. Since 2019, New York University has been offering the course "Algorithmic Responsibility for Journalists", which teaches algorithm auditing. The University of Texas has opened an automated journalism lab where students create programs for sports news. In 2022, Northwestern University (Illinois) launched the Medill AI for Local News project, in which students, along with engineers, develop bots for local media, combining study and research. Data journalism and Python skills are becoming the standard in training journalists. However, in some traditional schools, especially those focused on creative writing and broadcasting, AI is perceived more as a topic for discussion rather than a practical tool. Student communities and external organizations, such as the Knight Foundation and Mozilla, which finance training programs and competitions, play an important role. In general, the introduction of AI into journalism education in the United States is developing from the bottom up: initiatives come from universities and communities, which creates diversity, but also heterogeneity in the training of specialists.

China.China has a large-scale centralized government program to integrate AI into education. The main goals are to train approximately one million AI specialists by 2030 and create more than 50 advanced AI centers at worldclass universities. By 2024, over 500 universities have opened AI specialties, covering almost all major educational institutions in the country (Fu & Ji, 2024).

The government is actively investing in equipping universities with modern digital equipment, while large private companies as Alibaba, Tencent, Baidu also support universities with cloud technologies and software. For example, iFlytek has implemented a voice assistant system in Chinese at pedagogical universities to help students (Zhejiang University, 2025). In 2025, a program to support the western regions was launched with the creation of branches of technical universities and the supply of modern equipment (Central China Normal University, 2024).

In journalism, leading faculties such as the University of Communications of China work closely with state media. The Xinhua news agency and TV already use AI-robot presenters and automatic news production, which gives students the opportunity to learn based on advanced technologies (UNU Macau, 2024). Ethical regulation of AI in China is being formed within the framework of the state digital development strategy. In 2021, the national ethical principles for the development of artificial intelligence were published, emphasizing the priority of social stability, social responsibility and controllability of

technology. Research shows that the Chinese model of AI regulation combines the normative consolidation of value orientations and centralized control by the state, which distinguishes it from Western models focused on individual rights and transparency of algorithms (Fu & Ji, 2024).

Pedagogical practices in Chinese higher education are large-scale and focused on the integration of AI. Online platforms are widely developing in the country, allowing millions of students to access courses from leading professors using AI systems that monitor progress and answer questions. The educational programs include technological modules aimed at developing digital competencies and working with big data, which is especially important for journalism and the media sphere. Students gain practical skills in working with digital tools through projects and internships, which increases their competitiveness in the labor market.

Japan. Japan, with its advanced economy and technology, is introducing AI into education more cautiously, focusing on preparing the ground and studying the effects. The policy is formed by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). In 2022-2023, MEXT issued a number of recommendations for schools and universities: for example, the "Guide to the Use of AI in Education" (2023), which calls for combining AI tools with the development of students' critical thinking and understanding where AI is useful and where it is harmful (Fu & Ji, 2024). AI education occupies an important place in the national strategy "Society 5.0": it is assumed that AI will help solve the problem of labor shortages (including teachers) in the aging population of Japan, as well as individualize education for different students. MEXT funds pilot projects in a number of schools, testing them before widespread implementation.

Technology accessibility: Japanese universities are well equipped, and connectivity is excellent even in remote areas (due to the country's compactness and investments). However, until recently, Japanese teachers were in no hurry to switch to digital methods, Japan was lagging behind in educational digitalization (before Covid, most universities made little use of online learning). The pandemic has pushed for change, and now the infrastructure is ready to accept AI tools. The advantage of Japan is the high level of technical literacy of students compared to many countries (almost all young people know how to use various applications and gadgets). Journalism faculties use both global tools (English-speaking) and local Japanese developments: for example, there are Japanese speech recognition systems that are used in media schools to transcribe interviews (which saves students time).

In 2023, the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT) published an official notification on the treatment of generative AI at universities and colleges. The document highlights that the use of generative and independent intellectual work by a student is "unable to deepen their own understanding" and is generally considered as an appropriate practice in the educational process (Kaneko, 2023)

At the same time, Japan actively participates in the development of international principles of “Human-Centered AI” through the OECD organization, and these principles are also being implemented in domestic policy: AI is only an assistant, it should not replace humans, it is necessary to maintain human control and understanding. The ethical education of students includes discussions about the impact of AI on society (for example, on the employment of journalists, on the quality of information), which is part of a more general medialitacy course.

Pedagogical practices: Japanese universities are starting to use AI for educational purposes, often relying on robotics. There are known cases of using mentor robots in elementary and secondary schools (robots that teach English in rural schools). Of course, robots are not used in journalism universities, but they can be used to demonstrate technology: for example, at Waseda University, the journalism faculty held a lecture with a robotic TV presenter, after which students discussed whether he could replace a human. Practically, Japanese NLP tools are used in the educational process: systems that check articles for compliance with stylistic norms can offer headlines (analogous to Western ones, but in Japanese). Teachers encourage students to check the facts found by AI, teaching them not to trust blindly. Japan has a strong tradition of group learning, and they are currently experimenting with peer-learning: groups of students work together on projects, and the AI system provides hints and ratings of the ideas they generate. Such a project was implemented at the University of Tokyo for a course on digital media: an AI analyzer evaluates the proposals of news startups from students, highlighting the most promising ones - this stimulates discussion and refinement of ideas.

The results of a comparative analysis of the introduction of artificial intelligence technologies into higher education (using the example of training journalists) are systematized and presented in Table 2.

Table 2.

Comparative characteristics of the introduction of AI in higher education (journalism) by region

Aspect	Kazakhstan	Europe	USA	China	Japan
Government policy	AI concept 2024-2029, top-down, goals of 20% of universities by 2025, 60% by 2029, support for international cooperation (Google, KazLLM), budget 650 billion tenge.	Digital Education Plan 2021-2027, Horizon Europe, national strategies, support for research and AI literature.	Decentralized, initiatives come from universities and communities; advisory recommendations at the national level (ACE); some states are considering funding open resources.	Centralized strategy, training of ~1 million specialists by 2030, >50 AI centers, mass implementation in universities and the media, support for the private sector.	Gradual implementation, Society 5.0 strategy, hybrid approach: the state sets the framework, universities are autonomous, emphasis on critical thinking.
Technologies	AI platform, supercomputer, competence centers, 92.9% Internet coverage.	High level of equipment, cooperation with the media (BBC, Reuters, DeutscheWelle)	High-tech infrastructure of leading universities, the gap between large universities and colleges.	Mass equipment, online platforms for millions of students, support for the public and private sectors.	Well-equipped universities, excellent communications, and infrastructure are ready after the pandemic.
Ethics and legal aspects	The concept and draft law "On AI", the formation of university rules, seminars and conferences on AI ethics.	EU recommendations, university committees, transparency of algorithms, data protection.	Internal codes of universities, expanding the concepts of plagiarism on AI, courses on ethics of algorithms.	Code of Ethics for AI, emphasis on the public good, honesty, data accuracy, human control.	Prohibition on the replacement of human AI, internal rules, participation in international principles of Human-Centered AI, discussion of social consequences.
Pedagogical practices	New AI and digital journalism courses, teacher retraining, hackathons and projects. Examples: Bachelor's degree program in Digital Journalism (Astana IT University, 2022), seminars on AI ethics (Satpayev University, 2023).	Project courses, collaboration with EdTech, EDX and Coursera platforms, AI literature for humanities and technical students. Examples: Elements of AI (Finland, Estonia), courses on algorithmic skills (Spain, Tejedoretal, 2024).	Online courses, IT specialists, hands-on practice with popular bots, Python, and data journalism. Examples include Medill AI for Local News (Northwestern University, 2022) and Algorithmic Accountability Reporting (New York University, 2019)	Massive online courses, AI mentors, projects and internships, an emphasis on Big Data and digital competencies. Examples: iFlytek voice assistants, internships with Xinhua and TV News, online platforms for millions of students.	Robotics for demonstration, Japanese NLP systems, critical thinking, group projects with AI tips. Examples: Waseda University's mentor robot, an automatic review system for articles and headlines at the Faculty of Journalism.
Critical analysis and features	An active strategy, limited resources, the initial stage of integration, flexible borrowing of international	Strong integration into digital strategies, differences between EU	Flexibility and innovation, fragmentation and the gap between universities, the predominance of	Large-scale implementation, systematic approach, strict control limits creative application, high centralization.	Slow implementation, emphasis on ethics, critical thinking and inclusivity, a combination of top-down and university

	experience. Features: a combination of a top-down approach with the adaptation of global practices, attention to the Kazakh language and cultural peculiarities (KazLLM).	countries; high degree of university autonomy while respecting ethical standards. Features: massive increase in AI literature, collaboration with the media industry, student project work.	the bottom-up approach. Features: wide variability of practices, participation of student communities and external funds, development of applied skills through laboratories.	Features: training specialists for economics and startups, integration of AI at the mass level, practical ethics.	autonomy. Features: attention to the social role of AI, support for remote and special schools, and the gradual introduction of new technologies through pilot projects.

A comparative analysis of the introduction of artificial intelligence into higher education (using journalism as an example) shows both universal trends and significant regional differences.

General trends. All countries recognize the need to adapt educational programs to the age of AI: new courses are being created on working with data, learning digital tools and improving AI literature. Ethics is taking on an increasing role: university and national rules for the use of AI, especially generative systems, are being developed. The teacher remains a key participant in the process: AI is perceived as an auxiliary tool, not a substitute for humans.

Regional differences. China and Kazakhstan demonstrate a systematic, top-down approach: high investment, centralized management and large-scale implementation. The difference in emphasis is that China is focused on economic impact and mass training of specialists, while Kazakhstan is focused on adapting international experience and cultural and linguistic peculiarities (KazLLM).

The USA and a number of European countries are implementing initiatives mainly from below: universities, research centers, EdTech companies. This creates innovation and diversity of practices, but also fragmentation. In these countries, the main focus is on developing students' analytical and research skills.

Japan demonstrates a hybrid approach: the state sets the framework and ethical standards, universities maintain their autonomy. The emphasis is on critical thinking, inclusivity, and the social function of AI.

Recommendations for Kazakhstan include the development and adaptation of ethical standards for the responsible use of AI in the educational process, as well as the creation of open educational resources in the Kazakh language to overcome language barriers and ensure equal access to learning opportunities. It is also important to introduce a system for monitoring the effectiveness of implemented AI courses, including the assessment of their impact on graduates' career paths. In addition, Kazakhstan should continue retraining teachers and support the development of projects aimed at integrating AI into various academic disciplines.

In order to complement the qualitative comparison presented in Table 1, selected quantitative indicators reflecting infrastructural readiness, scale of AI implementation, and policy commitments are summarized in Table 2. These indicators do not aim to provide exhaustive statistical measurement but serve as analytical proxies allowing structured cross-regional comparison.

Table 2.
Selected Quantitative Indicators of AI Integration in Higher Education (Journalism Context)

Indicator	Kazakhstan	European Union	USA	China	Japan
Internet penetration (%)	92.9%	89–95% (varies by country)	~92%	~76–80%	~94%
Universities offering AI-related programs	Target: 60% by 2029	Widespread integration	Institution-driven	>500 universities	Expanding
National AI Strategy	Yes (2024–2029)	Yes (AI Act, Digital Plan)	Advisory federal guidance	Yes (2017 Plan; national targets)	Yes (Society 5.0)
Target number of AI specialists	Expanding programs	Not centralized	Not centralized	~1 million by 2030	Not centrally quantified

The quantitative indicators reveal important structural asymmetries. China demonstrates the highest degree of centralized scaling and measurable expansion targets, while Kazakhstan reflects ambitious strategic planning combined with ongoing infrastructural development. The European Union shows high digital penetration but emphasizes regulatory harmonization rather than numerical mobilization. The United States displays strong infrastructural capacity without centralized coordination, whereas Japan combines high technological readiness with gradual, non-quantified implementation.

Thus, statistical proxies confirm that AI integration models differ not only in policy rhetoric but also in measurable structural commitments and infrastructural capacity.

In all the countries studied, there is a recognition of the need to adapt journalism education to the era of AI. The curricula include new courses on working with data, mastering digital tools, and improving AI literacy. The importance of training graduates who are able to adapt to the transforming media and technological landscape is emphasized. In addition, attention to ethics is increasing everywhere: universities are developing regulations on the use of AI, especially generative systems (ChatGPT, etc.), which has become especially relevant since 2023. There is also a common understanding of the role of the teacher as an indispensable participant in the educational process, AI is everywhere perceived as an auxiliary tool, not an alternative to humans.

Regional differences are caused by political and administrative traditions, economic resources, cultural attitudes, and educational priorities.

China has a centralized education digitalization strategy that ensures high-speed AI adoption and coordination between levels. On the contrary, in the United States, Great Britain, and a number of European countries, initiatives often come from "below" from universities, research centers, and EdTech companies. This leads to fragmentation, but it also promotes innovation.

Kazakhstan occupies an intermediate, but strategically advantageous position: it actively borrows and adapts international best practices, taking into account national realities, cultural characteristics and linguistic specifics. Despite the objective limitations in resources compared to developed countries, the state demonstrates a consistent and purposeful policy in the field of digital transformation of education. Kazakhstan shows an example of flexible integration of innovations, in which digitalization is not perceived as an end in itself, but becomes a tool for modernizing and increasing access to education.

Japan demonstrates a hybrid approach: the state sets the framework, but universities retain their autonomy. The ethical aspects and social function of AI are more prominent here, with an emphasis on supporting remote schools and students with special needs.

Cultural differences manifest themselves in the perception of AI. In Western countries, the risks and benefits of technology are actively discussed, and students are involved in these discussions. In Asian schools, innovations are introduced more consistently and hierarchically, and students are more likely to

demonstrate their willingness to adopt technology. However, the language barrier remains a problem: English-language resources dominate, and this limits the availability of AI tools. Localized language models are being developed in China and Japan, and steps are also being taken in this direction in Kazakhstan (for example, KazLLM).

In the USA and Europe, the main focus is on improving the quality of education and analytical skills of students (for example, in journalism, conducting investigations using AI). In China and Kazakhstan, the focus is on the economic impact: graduates should be able to develop AI products and launch startups. In Japan, it's about equality and inclusivity.

Teachers' willingness to integrate AI varies: in China, it happens with strong government support, in Europe and the United States more flexibly, with an emphasis on digital autonomy and the development of a culture of innovation. Professional development programs are being implemented in Kazakhstan. In Japan, innovation is introduced through gradual reflection, supported by academic traditions.

The level of trust in government and technology is higher in China and Kazakhstan, which accelerates digital transformation. In Western countries, on the contrary, caution and criticality prevail due to concerns about privacy and transparency of algorithms.

Practical recommendations include the development and adaptation of ethical standards for the use of AI in the educational process, ensuring that new technologies are applied responsibly and transparently. It is also important to create open educational resources, including materials in the Kazakh language, in order to provide equal access to AI-related learning opportunities and reduce language barriers. In addition, regular performance monitoring should be introduced: after several years, the impact of AI courses on graduates' career trajectories should be assessed to determine their practical effectiveness and relevance to the labor market.

Future work may focus on interdisciplinary differences, quantifying the level of AI integration (for example, through the creation of the AI Integration Index), as well as examining students' perceptions of AI in different countries. It is promising to conduct a case study on specific universities, allowing for a deeper understanding of barriers and successful practices.

Conclusions

By the mid-2020s, the integration of artificial intelligence into higher education in journalism had become a global phenomenon, but it proceeds in different ways depending on regional conditions. Global trends include an accelerated revision of curricula taking into account digital skills and AI, the search for the optimal combination of technology and traditional teaching methods, as well as increasing attention to issues of ethics and equal access. Comparative sociological analysis has shown that each region, as well as each country, has its own unique "ecosystem" of AI implementation.

In Kazakhstan, there is a proactive government strategy and the desire to quickly catch up, as in other CIS countries, through large-scale effective initiatives, while the challenges remain the lack of practical experience among teachers and logistical resources among some universities, the need to localize content (taking into account the use of Kazakh as the main language in working with AI) and the formation of a high culture of academic integrity in the new digital environment.

In Europe, there is a gradual but thorough integration, framed by strict ethical standards and regulations; European journalism programs focus on improving analytical skills and critical thinking, using AI as a tool, but at the same time limiting it if it contradicts values (transparency, fairness).

In the USA, there is a mosaic of approaches: outstanding innovations are juxtaposed with conservatism; market demand and initiatives of universities themselves play a key role. The American experience is valuable as examples of successful practices emerging from below, but there is a lack of uniformity, the gap between leaders and laggards may grow.

China has an unprecedented large–scale integrated AI development in the shortest possible time, based on centralized management and resources; students gain access to technology from an early age. China demonstrates the high results that can be achieved by comprehensive, clear and systematic mobilization of all levels of higher education.

In Japan, there is a moderate, prudent path: Japanese universities modernize education, carefully analyzing the effectiveness of innovations. Combining advanced technologies with a traditional educational

culture takes time to adapt, but in the long run, Japan is able to quickly scale successful solutions (for example, the use of robots or AI assistants) to the national level thanks to the unity of standards and government support.

Summing up, we can conclude that the successful implementation of AI in higher education is a multifaceted process that requires a balance between technical innovation and social and moral values. The experience of different regions teaches that not only the technologies themselves are important, but also the context of their application: politics, culture, and people's willingness to change. In the context of journalism education, this means educating a new generation of professionals who not only possess AI tools for creating and distributing information, but are also aware of the responsibility for their use. International exchange of experience plays a key role: globally, countries should learn from each other how to integrate AI into education as effectively and ethically as possible. Such cooperation and comparison of approaches will help to develop best practices that ensure the quality and inclusivity of education in the digital age.

In conclusion, we note that the introduction of AI is not a one–time event, but a phenomenon that is increasing its presence in an increasing number of areas of our lives. Undoubtedly, AI technologies will continue to evolve, so the modern higher education system must remain flexible, operational and adaptive. Keeping a human being – a teacher, a student, an editor – at the center of the educational process, with all the growing influence of artificial intelligence (AI), will ensure that higher education is not only high-tech, but also humanistic, aimed at modern comprehensive civilizational development of the individual and society.

Conflict of Interest Statement

The authors declare no potential conflicts of interests regarding the research, authorship, or publication of this article.

Author Contributions

The authors affirmed that there is no conflict of interest in this article. Nurbanu A. Abueva carried out the conception and investigation. Aliya M. Zhusupova overlook the writeup of the whole article and prepared the relevant literature. Saltanat S. Massakova wrote the research design and conducted the data entry, revised critically the article for intellectual content. Anna S. Buzelo carried out the data analysis. Unerbek A. Abuev prepared the interpretation of the results, contributed to drafting and revising the article.

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Received: 27.05.2025
Revised: 26.08.2025
Revised: 27.02.2026
Accepted: 10.03.2026
Published: 30.06.2026