

ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION IN MOLDOVA: PEDAGOGICAL OPPORTUNITIES, INSTITUTIONAL CHALLENGES, AND EMERGING PRACTICES

Alexandr PARAHONCO, scientific researcher

<https://orcid.org/0009-0007-3486-5597>

"Vladimir Andrunachievici" Institute of Mathematics and Informatics
Moldova State University

Abstract. The article examines the role of artificial intelligence in higher education in the Republic of Moldova, focusing on pedagogical opportunities, institutional challenges, and emerging practices. It discusses the use of AI in instructional design, personalized learning, automated feedback, and academic workflow support. Particular attention is given to academic integrity, anti-plagiarism policies, and the need for responsible, transparent, and human-supervised implementation. The article argues that AI should be integrated as a pedagogical assistant that supports teachers and students rather than replaces human academic judgment.

Keywords: artificial intelligence in education, higher education, Republic of Moldova, university pedagogy, educational policy, academic integrity, AI assistant.

INTELIGENȚA ARTIFICIALĂ ÎN ÎNVĂȚĂMÂNTUL SUPERIOR DIN REPUBLICA MOLDOVA: OPORTUNITĂȚI PEDAGOGICE, PROVOCĂRI INSTITUȚIONALE ȘI PRACTICI EMERGENTE

Rezumat. Articolul analizează rolul inteligenței artificiale în învățământul superior din Republica Moldova, evidențiind oportunitățile pedagogice, provocările instituționale și practicile emergente. Sunt discutate utilizările IA în sprijinirea proiectării didactice, personalizarea învățării, feedbackul automatizat și organizarea activităților academice. O atenție specială este acordată integrității academice, politicilor antiplagiat și necesității unei utilizări responsabile, transparente și supravegheate de factorul uman. Articolul susține integrarea IA ca asistent pedagogic, nu ca substitut al cadrului didactic, indicând direcții pentru politici universitare și formarea profesorilor.

Cuvinte-cheie: inteligență artificială în educație, învățământ superior, Republica Moldova, pedagogie universitară, politici educaționale, integritate academică, asistent IA.

Introduction: Artificial Intelligence in Higher Education in Moldova

Artificial intelligence is reshaping educational practice, influencing how students access information and how teachers design materials. Students use AI to summarize, translate, solve problems, and draft work; teachers apply similar tools for explanations, assessments, and organizing complex content. The central question is how AI can support learning without weakening authorship, critical thinking, or academic judgment.

Generative AI goes beyond earlier technologies: it produces explanations, outlines, arguments, code, and images. It can support learning but also imitate it, reducing effort. International organizations highlight both opportunity and governance challenge. UNESCO emphasizes policy planning, human capacity development, and a human-centred

vision of AI use [1]. Similarly, the European Commission stresses ethical and critical AI literacy [2]. These perspectives show the issue is not prohibition versus unrestricted adoption.

In Moldova, AI in education is addressed through awareness campaigns, teacher training, integrity measures, and alignment with European governance [3-6]. Universities must innovate while protecting privacy, transparency, authorship, and assessment quality.

This article examines AI in Moldovan higher education as pedagogical opportunity, institutional challenge, and emerging practice. It argues AI should act as a controlled assistant for didactic design, workflow organization, and feedback. Gravis is discussed as one example of an AI assistant for lecture design. The broader aim is to situate such tools within a responsible framework where AI remains subordinate to human judgment and academic integrity.

AI in Education: Applications, Benefits, and Emerging Risks

Research shows that AI in education covers diverse areas: adaptive learning, generative tutoring, automated feedback, teacher assistance, research support, and assessment support. Each contributes differently—some personalize instruction, others reduce workload or strengthen assessment. Yet risks include hallucinated content, overreliance on feedback, fabricated references, bias, and data misuse. Table 1 summarizes typical uses, value, and risks.

Table 1. Educational applications of artificial intelligence and their associated pedagogical value and risks

AI application area	Typical use in education	Main educational value	Main risk
Adaptive learning	Personalized exercises and learning paths	Differentiated instruction	Narrow measurement of learning
Generative tutoring	Explanations, examples, Socratic dialogue	Scalable individual support	Hallucinations and shallow learning
Automated feedback	Grammar, code, quizzes, formative assessment	Faster response to students	Overreliance and weak human review
Teacher assistance	Lesson plans, slides, tasks, rubrics	Reduced workload and improved planning	Loss of pedagogical intentionality
Research support	Summaries, literature mapping, statistics	Faster academic workflows	Fabricated references and data misuse
Assessment support	Similarity checks, rubric support, analytics	Integrity and consistency	Surveillance, bias and false positives

Scholars agree AI enhances quality when embedded in pedagogical design, not used as a shortcut. The most promising uses support reasoning, provide feedback, and stimulate reflection. The least valuable occur when AI replaces effort or hides intellectual sources.

For teachers, AI is constructive: generating examples, lesson structures, summaries, comparisons, and student-friendly explanations. Moldova’s Ministry of Education has promoted training on “*Artificial Intelligence in Education*”, focusing on teaching,

assessment, and personalization [4]. This frames AI as professional competence rather than prohibition.

The central tension is assistance versus substitution. AI is valuable when it strengthens human agency, risky when it replaces it. Universities therefore need systems that make AI use visible, bounded, and aligned with academic goals.

The Moldovan Educational Policy Context: From Digitalization to Responsible AI Governance

Moldova's approach to AI in education appears developmental rather than prohibitive. Although the regulatory framework is still emerging, policy activity is visible through digital education strategies, safe-use campaigns, teacher training, academic integrity studies, anti-plagiarism mechanisms, curriculum modernization, and alignment with European governance standards [3-7]. The 2026 campaign "Hai să utilizăm inteligența artificială în siguranță!" framed AI in terms of safety, ethics, responsibility, and guidance, while the 2025 course "Inteligența Artificială în educație" trained teachers and managers to use AI for teaching, assessment, and personalization, suggesting a policy preference for competent pedagogical integration rather than simple restriction [3-4]. This orientation is consistent with European developments, including the Council of Europe Framework Convention on Artificial Intelligence and the EU Artificial Intelligence Act, which emphasize human rights, transparency, accountability, data protection, and risk-based regulation in areas including education [8-9]. The 2025 national curriculum reference framework also includes AI-related perspectives such as personalized learning pathways, digital portfolios, and collaborative platforms, confirming that AI is becoming part of educational modernization, even if detailed operational rules are still developing [7]. Overall, Moldova appears to be moving toward regulated, transparent, and human-supervised AI use, combining pedagogical innovation, academic integrity, data protection, teacher training, and human responsibility.

Academic Integrity and the Challenge of AI-Assisted Work in Higher Education

The standards approved through Order no. 914 of 12 May 2026 show that Moldova's academic integrity policy is moving beyond copied-text detection toward questions of authorship, responsibility, and intellectual contribution. Originality is defined as the authentic result of personal intellectual activity, while unauthorized generative AI use becomes problematic when it violates institutional rules, remains undeclared, substitutes the author's contribution, or leads to plagiarism, data falsification, assessment fraud, or other integrity violations [10]. At the same time, the standards reject purely automated control: decisions on plagiarism, ghost-writing, data falsification, or unauthorized AI use cannot rely solely on digital tools, since similarity reports and AI detectors have only an

auxiliary role and must be interpreted through qualitative academic analysis of context, citation, paraphrasing, field specificity, study level, and the author's contribution [10]. The 2025 academic integrity study, involving 3,635 students and 419 teaching staff from six universities, confirms that AI has become part of current institutional debates on authorship, assessment, and academic responsibility [5] (see Fig. 1).

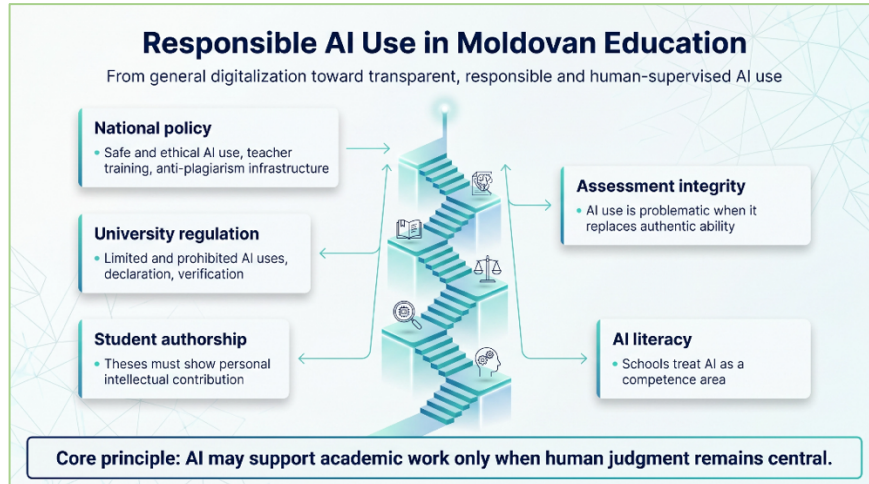


Figure 1. Responsible AI use in Moldovan Education

For university teachers, current Moldovan policy evidence does not indicate a general prohibition of AI for lecture preparation, teaching materials, or research support. Rather, teacher training initiatives and official language suggest that professional AI use is acceptable when transparency, data protection, intellectual property, and human academic judgment are preserved [3-4]. At the national level, the emphasis is on responsible use, teacher training, and anti-plagiarism infrastructure; at the university level, on declaration of AI use, human verification, authorship, and assessment integrity; and at the school level, on AI literacy and safe-use campaigns. Figure 2 summarizes this movement toward controlled integration under human academic responsibility rather than a general ban.

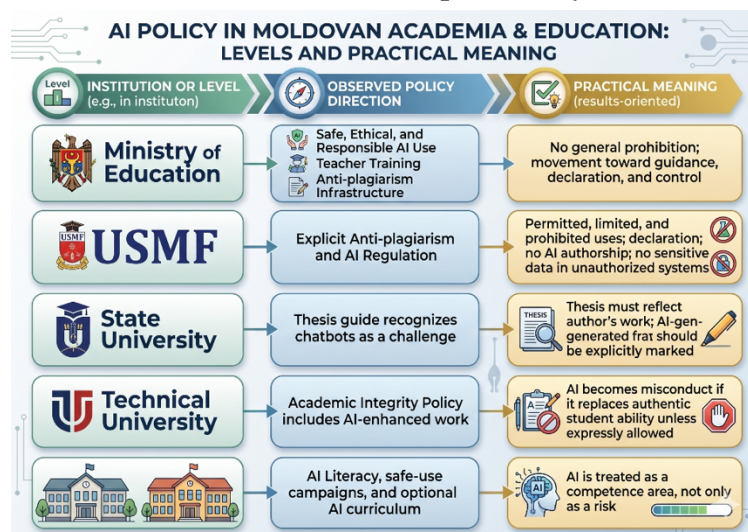


Figure 2. Responsible AI use in Moldovan education: policy directions, institutional regulation and academic integrity principles

University-level documents confirm this direction. The 2026 regulation of the Public Institution Nicolae Testemițanu State University of Medicine and Pharmacy, which establishes a Centre for Anti-Plagiarism and Artificial Intelligence, distinguishes between limited and prohibited AI uses. Substantial text generation or reformulation, AI-assisted data interpretation, and AI-generated scientific images may be admissible only with transparency, justification, verification, approval, or monitoring, while presenting AI-generated content as one's own work, fabricating data or references, uploading sensitive data into unauthorized systems, using AI for automatic academic judgments, or naming AI as author, co-author, evaluator, or supervisor is prohibited [11]. Similar principles appear in the methodological guidance of the State University of Moldova, which requires students to remain responsible for their theses and to mark automatically generated fragments, and in the Technical University of Moldova's policy, which treats AI-enhanced work as problematic when it no longer reflects the student's own abilities unless explicitly permitted, while also requiring teachers to design assessments that promote responsible and ethical AI use [12–13]. Together, these documents show that Moldovan higher education is developing AI governance around transparency, declaration, assessment design, teacher guidance, and preservation of human academic judgment.

Study Case in Moldova: From AI Awareness to the Need for Local Academic Assistants

An important feature of the Moldovan case is that artificial intelligence is becoming relevant across all educational levels, not only in universities. The Ministry's campaign on safe AI use addresses children and adolescents, while teacher training initiatives focus on the professional use of AI in teaching and assessment [3-4]. At the same time, curricular discussions increasingly refer to personalization, digital educational practices, and the preparation of learners for responsible interaction with intelligent technologies [7]. These directions suggest a multi-level policy logic: pupils need safe and age-appropriate guidance, teachers need methodological competence, and universities need transparent procedures for academic integrity and responsible AI use.

This policy movement creates a practical pedagogical tension. Moldova needs to develop AI literacy among learners and teachers, but the same tools that support understanding may also encourage learners to bypass the learning process and obtain ready-made answers. Therefore, the central question is not whether AI should be allowed, but how educational tasks should be redesigned so that AI supports explanation, reflection, verification, and practice. Stanford's AI literacy framework emphasizes functional, ethical, rhetorical, and pedagogical literacy within a human-centred approach, while MIT Sloan recommends using AI for practice quizzes, visual summaries, and explanatory dialogue rather than only for output generation [14-15].

This issue is especially important for younger learners. In primary and lower-secondary education, the main risk is not only that pupils may receive incorrect answers, but that they may become interested only in the answer and ignore the reasoning process. Recent pedagogical discussions argue that AI-related tasks should require students to compare answers, justify decisions, document reasoning, and reflect on how they reached a solution [16]. Stanford’s discussion of pedagogical chatbot uses similarly presents AI as a tutor, coach, student, or simulator, roles that can stimulate questioning, explanation, metacognition, and guided practice [17]. For Moldova, AI awareness should therefore move beyond general safety campaigns toward locally adapted classroom models in which pupils learn to question AI responses and use them as support for understanding rather than as shortcuts.

This need became visible during the fourth edition of “Ziua Pi Bune”, organized on 13 March 2026 in Chişinău by the Vladimir Andrunachievici Institute of Mathematics and Computer Science, where more than forty children participated in activities promoting mathematics and informatics [18]. As part of the organizing team, I demonstrated AI Guguță, an assistant designed for pupils in grades 4–6. The aim was to observe how it formulates explanations, adapts vocabulary, and structures pedagogical support compared with general-purpose systems such as ChatGPT, Gemini, or Claude. However, many pupils were attracted mainly by the possibility of obtaining the answer quickly; once the answer appeared, the explanation often became secondary. This observation showed that the central challenge is not only technical quality, but also the need to guide pupils toward understanding, checking, explaining, and practicing.

This experience suggests that local educational assistants for Moldova should not function as simple answer-generating systems. They should include pedagogical constraints that encourage explanation before final answers, require learners to compare their reasoning with the AI response, ask follow-up questions, and practice similar tasks after receiving support. Such a design corresponds to international recommendations emphasizing process documentation, reflection, verification, and active engagement in AI-supported learning [14-17]. This is especially important because early patterns of AI use may shape later academic habits.

At the university level, the situation is more differentiated. Some students use AI superficially to produce text quickly, while others use it productively as a tutor, dialogue partner, translation assistant, research assistant, or tool for self-development. The same technology can therefore either support intellectual growth or reduce intellectual effort, depending on task design, user competence, and institutional rules. The Moldovan case points to the need for a continuum of AI governance: safe-use education for pupils, pedagogical training for teachers, transparent integrity rules for universities, and locally

developed AI assistants that reflect the linguistic, cultural, curricular, and academic needs of the national education system.

Gravis: An Intelligent System for Guiding Lecture Design

Gravis is designed as an academic assistant for university teachers, supporting lecture design, research preparation, and teaching material organization. Unlike general chatbots, it functions as a structured companion that transforms dispersed sources and institutional requirements into coherent pedagogical products, while preserving scholarly responsibility.

Institutionally, Gravis complements platforms like Moodle, which manage courses and assignments but rarely assist with deeper intellectual work. Integrated with timetables, course structures, and student data, Gravis could provide customized reports and teaching analytics.

Compared with commercial AI tools, Gravis avoids dependence on external platforms and complex prompt-engineering, aligning instead with university policies, integrity rules, and curriculum standards. Its workflow begins with research planning, followed by information collection and synthesis into structured academic outputs (see Fig. 3).

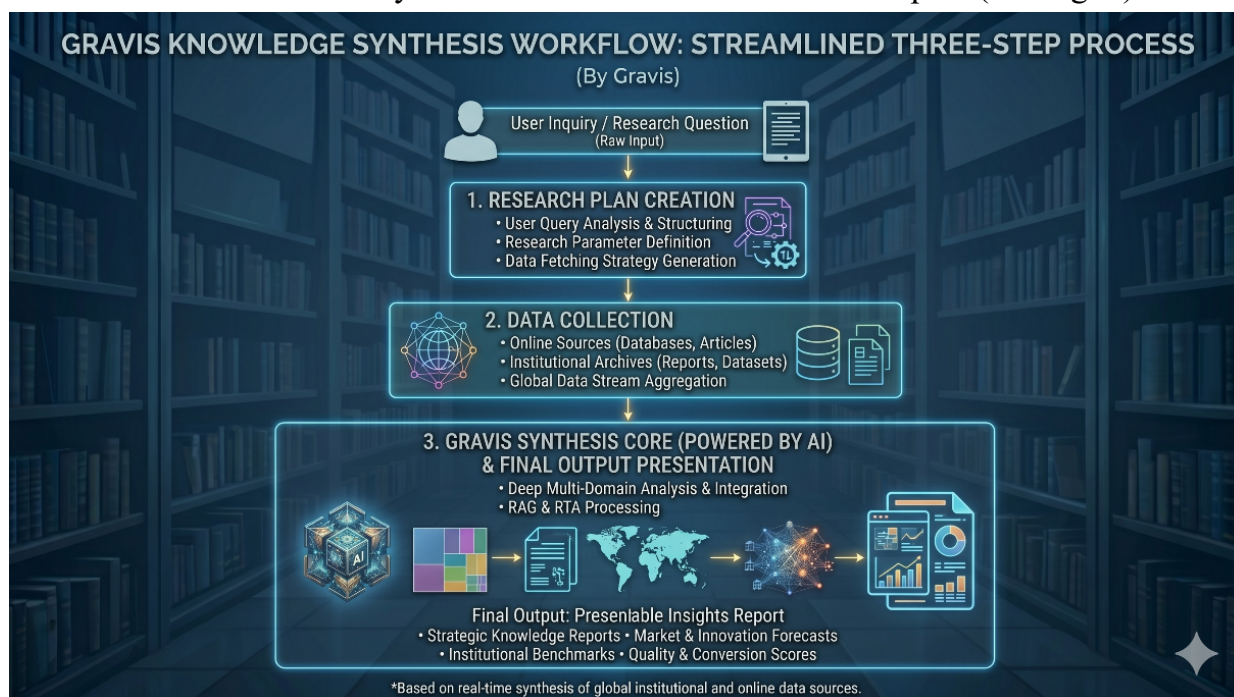


Figure 3. Process Diagram of the Gravis Workflow

Currently, Gravis performs three core functions—planning, collection, and synthesis. Future development aims for greater interactivity, enabling deeper research, adaptation for diverse student groups, and detailed revisions. The system is not intended to replace teachers, but to organize research, reduce routine workload, and ensure human responsibility for final academic judgment.

Conclusions

Artificial intelligence is already influencing higher education by changing how students access information, how teachers prepare materials, and how universities protect academic integrity. Therefore, the main issue is not whether AI should be present in education, but how its use can be regulated, guided, and pedagogically justified. The case of the Republic of Moldova shows a transitional but meaningful movement toward responsible AI integration. Current policy and institutional evidence don't suggest a general prohibition of AI; rather, it indicates an emerging model based on transparency, human supervision, academic responsibility, and the protection of intellectual contribution.

The Moldovan context is important because the national framework is still developing. Awareness campaigns, teacher training initiatives, curriculum-level references, academic integrity studies, anti-plagiarism mechanisms, and broader governance initiatives show that AI has entered the educational policy agenda. However, these measures do not yet provide a complete operational model for everyday university practice. Higher education institutions therefore need internal procedures, pedagogical strategies, and digital tools that support responsible AI use while preserving data protection, authorship, assessment quality, and human academic judgment.

In this context, Gravis is discussed as one possible example of an AI assistant adapted to university needs. It is not conceived as a replacement for the professor or as a general chatbot detached from institutional requirements, but as a structured academic assistant for lecture design, research preparation, and academic workflow organization. Its potential value lies in helping teachers organize complex information, transform dispersed sources into coherent pedagogical materials, and align academic work with institutional standards. Thus, Gravis illustrates the broader argument of the article: AI can support pedagogical innovation in Moldovan higher education only when it remains transparent, source-based, institutionally controlled, and subordinate to human responsibility.

Future development should focus on three priorities. First, AI assistants used in universities should rely on verified scientific and institutional sources. Second, they should make the role of AI visible by indicating how information was selected, processed, and used. Third, they should be integrated into real academic workflows, beginning with lecture design and gradually extending toward research support, reporting, and learning management systems. If developed according to these principles, AI assistants may contribute to pedagogical modernization in the Republic of Moldova while strengthening, rather than weakening, the professional role of teachers and the integrity of academic work.

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Received / Recepționat: 7.05.2026

Accepted / Acceptat: 29.06.2026

Email: alexandr.parahonco@math.md