TEACHER AGENCY AND AI COMPETENCY FRAMEWORKS IN HIGHER EDUCATION: UNESCO INSIGHTS

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Abstract. The accelerating integration of artificial intelligence (AI) into education necessitates a critical re-examination of teacher competencies, professional agency, and ethical governance frameworks. This article synthesises insights from the UNESCO online discussion on AI in education, focusing on the intersection between competency-based frameworks, teacher autonomy, and pedagogical transformation. Drawing upon conceptual contributions from the UNESCO Artificial Intelligence Competency Framework for Teachers (UNESCO, 2024) and related scholarly discourse, the paper argues that effective AI integration requires not only technological proficiency but also an ethically grounded, contextually responsive, and pedagogically sound approach. The analysis identifies five interrelated domains: AI as transformation, governance and ethics, teacher agency, inclusive pedagogy, and the role of open resources in fostering AI literacy. The article concludes by highlighting the implications for higher education pedagogues in designing curricula that support critical, reflective, and human-centred uses of AI.

Keywords: Artificial Intelligence in Education; Teacher Competencies; Teacher Agency; Ethical AI Governance; Higher Education Pedagogy; AI Literacy; Inclusive and Human-Centred Education

OLIY TA’LIMDA PEDAGOGLAR FAOLLIGI VA SUN’IY INTELLEKT KOMPETENSIYALARI: UNESCO MUHOKAMALARI

Annotatsiya. Sun’iy intellekt (SI)ni ta’lim jarayonlariga tobora tezkor integratsiyalashuv jarayoni pedagoglarning kasbiy kompetensiyalari, professional agentligi hamda axloqiy boshqaruv tamoyillarini tanqidiy qayta ko‘rib chiqishni talab etmoqda. Ushbu maqola UNESCO tomonidan o‘tkazilgan onlayn muhokama asosida SI va ta’lim masalalariga oid fikr-mulohazalarni tahliliy umumlashtiradi hamda kompetensiyaga asoslangan yondashuvlar, pedagog mustaqilligi va pedagogik transformatsiya o‘rtasidagi o‘zaro bog‘liqlikni yoritadi. UNESCOning “Pedagoglar uchun sun’iy intellekt kompetensiyalari doirasi” (UNESCO, 2024) hamda tegishli ilmiy manbalarga tayangan holda, maqolada samarali SI integratsiyasi nafaqat texnologik savodxonlikni, balki axloqiy asoslangan, kontekstga moslashuvchan va pedagogik jihatdan puxta yondashuvni ham talab etishi ta’kidlanadi. Tahlil beshta o‘zaro bog‘liq sohani ajratib ko‘rsatadi: SI orqali transformatsiya, boshqaruv va etika, pedagog agentligi, inklyuziv pedagogika hamda SI savodxonligini rivojlantirishda ochiq ta’lim resurslarining roli. Maqola yakunida oliy ta’lim pedagoglari uchun tanqidiy, refleksiv va insonparvarlikka asoslangan SIdan foydalanishni qo‘llab-quvvatlaydigan o‘quv dasturlarini ishlab chiqish bo‘yicha tavsiyalar ilgari suriladi.

Kalit so‘zlar: Ta’limda sun’iy intellekt; Pedagog kompetensiyalari; Pedagog agentligi; Axloqiy boshqaruv va SI etikasi; Oliy ta’lim pedagogikasi; SI savodxonligi; Inklyuziv va insonparvar ta’lim

АГЕНТНОСТЬ ПРЕПОДАВАТЕЛЕЙ И РАМКИ КОМПЕТЕНЦИЙ ПО ИСКУССТВЕННОМУ ИНТЕЛЛЕКТУ В ВЫСШЕМ ОБРАЗОВАНИИ: ОБСУЖДЕНИЯ ЮНЕСКО

Аннотация. Ускоряющаяся интеграция искусственного интеллекта (ИИ) в систему образования требует критического пересмотра профессиональных компетенций преподавателей, их агентности и этических принципов управления. В данной статье обобщаются основные идеи онлайн-дискуссии ЮНЕСКО, посвящённой вопросам использования ИИ в образовании, с акцентом на взаимосвязь между компетентностными моделями, автономией преподавателя и педагогическими трансформациями. Опираясь на концептуальные положения «Рамки компетенций по искусственному интеллекту для учителей» (ЮНЕСКО, 2024) и соответствующие научные исследования, автор утверждает, что эффективная интеграция ИИ требует не только технологической грамотности, но и этически обоснованного, контекстуально чувствительного и педагогически выверенного подхода. В анализе выделяются пять взаимосвязанных направлений: ИИ как фактор трансформации, управление и этика, профессиональная агентность преподавателя, инклюзивная педагогика и роль открытых образовательных ресурсов в развитии ИИ-грамотности. В заключение подчеркиваются последствия для преподавателей высшей школы в разработке учебных программ, способствующих критическому, рефлексивному и человекоцентричному использованию ИИ.

Ключевые слова: Искусственный интеллект в образовании; Компетенции преподавателей; Агентность преподавателя; Этическое управление ИИ; Педагогика высшего образования; ИИ-грамотность; Инклюзивное и человекоцентричное образование

Introduction. The rapid diffusion of artificial intelligence (AI) across social and educational systems has catalysed both enthusiasm and apprehension in academic and policy discourses. Within higher education, AI promises to personalise learning, automate assessment, and generate new pathways for innovation. However, these promises are counterbalanced by legitimate concerns regarding ethics, data privacy, algorithmic bias, and the erosion of teacher autonomy. The current moment thus demands not mere technological adaptation, but a deep pedagogical and ethical transformation in the professional preparation of educators.

UNESCO’s recent initiatives, including the AI Competency Framework for Teachers (2024) [1], have sought to provide structured guidance for educators navigating this complex landscape. Yet, the framework’s global relevance depends on its contextual adaptability—how teachers, institutions, and policymakers interpret and operationalise AI competencies in diverse cultural and institutional settings. In this sense, teacher agency becomes central: teachers are not passive adopters of AI technologies, but active shapers of their educational meaning and social consequences.

This article explores these issues through a synthesis of discussions from the UNESCO online forum on AI in education. It approaches the conversation analytically, identifying theoretical, ethical, and pedagogical tensions embedded in current AI integration efforts. The analysis foregrounds the importance of human-centred AI governance and the necessity of re-imagining teacher education to

align with the Sustainable Development Goal 4 (SDG4) agenda of equitable, inclusive, and quality education for all.

Methods. This study employs a qualitative, interpretive analytical approach based on the synthesis of discussions from the UNESCO online forum on AI in education. The forum brought together international educators, policymakers, and researchers to deliberate on AI's pedagogical, ethical, and systemic implications.
Data were derived from participant contributions and synthesised thematically using discourse analysis principles. The analysis sought to identify recurrent conceptual themes and interpret the implicit frameworks underpinning participants' perspectives. This method aligns with global discourse analysis traditions that treat policy forums as sites of collaborative knowledge production rather than prescriptive policymaking.

The UNESCO online discussion on AI in education convened a diverse range of international experts, policymakers, and educators to reflect on the pedagogical, ethical, and systemic dimensions of AI integration. The dialogue served as a collaborative knowledge-building exercise rather than a prescriptive policy event. Its analytical value lies in the convergence of perspectives around teacher empowerment, competency development, and governance.

This paper synthesises key thematic patterns emerging from the discussion, treating the event as a form of global pedagogical deliberation. By paraphrasing and integrating the collective insights, the analysis identifies conceptual trends that extend beyond the forum itself. The approach is interpretive and analytical, informed by discourse analysis principles that seek to reconstruct the implicit frameworks underpinning participants' contributions [2].

Result. 3.1 AI Competency as a Multidimensional Construct: AI competency in education cannot be reduced to technical fluency. Rather, it involves a triadic synthesis of technological understanding, pedagogical application, and ethical awareness. According to UNESCO (2024), teacher AI competency encompasses the ability to critically evaluate AI tools, integrate them pedagogically, and engage with their ethical and social implications. This aligns with prior models of digital literacy [3,4], which position educators as mediators of technological meaning rather than mere consumers of digital tools.

Importantly, AI competency entails both instrumental knowledge (how to use AI) and epistemic understanding (how AI shapes knowledge production). Teachers must develop an awareness of algorithmic decision-making processes, data sources, and model biases. Such knowledge forms the foundation for responsible and context-sensitive AI use within pedagogical practice.

3.2 Teacher Agency in the Age of Algorithmic Mediation: Teacher agency, traditionally defined as the capacity to act intentionally and make pedagogical choices [5], gains renewed relevance in AI-mediated environments. In contexts where automated systems influence assessment, feedback, and even curriculum recommendations, educators must reclaim interpretive authority. Teacher agency thus becomes an act of resistance against the uncritical adoption of technological determinism.

Agency is not simply individual autonomy; it is relational, situated, and shaped by institutional structures. Within higher education, enabling teacher agency in the AI era means creating professional environments that value reflection, experimentation, and ethical deliberation. Without this, educators risk being confined to the role of system operators rather than pedagogical innovators.

3.3 Ethics and Governance as Core Pedagogical Dimensions: AI in education cannot be ethically neutral. Questions of bias, surveillance, data ownership, and inclusivity must be central to the pedagogical conversation. Governance frameworks—both institutional and international—play a crucial role in delineating the boundaries of acceptable AI use. UNESCO's 2021 Recommendation on the

Ethics of Artificial Intelligence provides an important normative baseline, emphasising transparency, accountability, and human oversight [6]. These principles must inform teacher preparation and continuous professional development programmes to ensure that ethical reasoning becomes embedded in pedagogical decision-making.

Discussion. 4.1 AI as Pedagogical and Institutional Transformation: A dominant theme emerging from the discussion concerns AI's transformative potential –not only as a technological innovation but as a catalyst for rethinking educational epistemologies. Participants stressed that AI challenges traditional notions of knowledge authority, learner engagement, and assessment. By automating routine tasks, AI can liberate teachers to focus on higher-order pedagogical functions such as mentorship, creativity, and emotional support. However, this transformation is contingent upon teachers' ability to navigate and critically interpret AI-generated data and recommendations.

AI's pedagogical implications extend to the curriculum level. Higher education institutions must rethink subject content, learning outcomes, and assessment methods to incorporate AI literacy. Integrating AI across disciplines – rather than treating it as an isolated technical domain – fosters interdisciplinary competence and prepares students for the complex ethical and social challenges of the digital era.

4.2 Governance, Ethics, and Responsible AI Integration: Ethical governance emerged as a second major pillar. Contributors emphasised that effective AI adoption in education requires a clear governance model ensuring transparency, accountability, and equity. The governance of educational AI must include mechanisms for public oversight and democratic participation. In higher education, this translates into institutional policies that safeguard academic freedom while setting standards for ethical AI use.

Ethical frameworks must address power asymmetries between technology developers, educators, and learners. Without explicit ethical guidance, AI may reinforce systemic inequities by replicating biases embedded in training data. Participants underscored the need for global collaboration to develop ethical norms while allowing for local adaptation a principle consistent with UNESCO's (2021) call for "context-sensitive universalism" in AI ethics.

4.3 Teacher Agency and Professional Identity: The third analytical strand concerns the redefinition of teacher identity in AI-mediated contexts. Teachers are no longer sole sources of information but facilitators of complex learning ecosystems where humans and machines co-create knowledge. This shift necessitates new forms of professional identity rooted in adaptability, critical literacy, and ethical discernment.

Teacher education programmes must therefore integrate AI-related pedagogical reflection as a core component rather than an optional add-on. Professional development should enable educators to design, evaluate, and critique AI tools, rather than simply use them. Such training reinforces teacher agency by positioning educators as informed decision-makers in AI implementation processes.

4.4 Inclusive Pedagogy and the Equity Challenge: A recurring concern throughout the discussion was the risk that AI could exacerbate existing educational inequalities. If deployed without attention to inclusivity, AI systems may privilege learners from data-rich, technologically advanced contexts while marginalising those in under-resourced regions. Inclusive AI pedagogy requires ensuring accessibility, linguistic diversity, and cultural relevance in AI tools and datasets.

Higher education institutions must thus adopt inclusive design principles and invest in capacity building for educators in developing contexts. This aligns with UNESCO's (2024) emphasis on AI for social good and the pursuit of SDG4.

Furthermore, inclusivity should not be limited to access but extend to participatory governance engaging teachers and students in decisions about AI integration.

4.5 The Role of Open Educational Resources and AI Literacy: Another insight concerns the synergy between open educational resources (OER) and AI literacy. Open resources can democratise access to AI education, enabling teachers and learners to experiment with tools and datasets without proprietary constraints. OER also supports the co-creation of AI literacy curricula that reflect diverse pedagogical traditions and epistemologies.

AI literacy, in this sense, transcends technical skill to encompass critical understanding of algorithmic systems, data ethics, and digital citizenship [7]. Embedding AI literacy in teacher education ensures that educators not only use AI tools effectively but also guide students in navigating their ethical and epistemic implications.

Implications for Higher Education Pedagogues

The synthesis of insights reveals several strategic imperatives for higher education pedagogy in the AI era. These implications operate across individual, institutional, and systemic levels.

5.1 Reframing Pedagogical Roles and Identities: AI invites a fundamental reframing of pedagogical roles. Instructors must evolve from content transmitters to learning designers who curate AI-supported environments that foster inquiry, creativity, and ethical reasoning. This role transformation entails cultivating reflexive awareness of how AI mediates cognition and interaction within the classroom.

Curriculum design must shift towards competency-based frameworks that integrate AI literacy as a transversal skill across disciplines. Teacher education programmes should introduce modules on algorithmic thinking, data interpretation, and ethical AI governance to prepare future educators for complex digital ecosystems.

5.2 Building Institutional Capacity and Ethical Governance: Institutions must build governance structures that articulate clear principles for AI adoption in teaching, assessment, and administration. These frameworks should align with UNESCO's ethical guidelines, ensuring transparency, explainability, and accountability. Governance should also protect teacher agency by involving educators in decision-making processes concerning AI procurement and deployment.

Professional development is central to institutional capacity building. Continuous learning opportunities should enable teachers to experiment with AI tools, share best practices, and engage in reflective communities of practice. Institutional recognition of AI-related pedagogical innovation can further motivate faculty engagement.

5.3 Strengthening Research-Practice Integration: Higher education institutions are uniquely positioned to bridge the gap between AI research and educational practice. Interdisciplinary collaboration among computer scientists, educators, ethicists, and social scientists can generate evidence-based approaches to AI integration. Such collaboration promotes a balanced view that values technological innovation while safeguarding pedagogical integrity.

Research on AI in education should adopt mixed-methods approaches that capture both quantitative performance outcomes and qualitative dimensions of learning, equity, and well-being. This aligns with UNESCO's broader advocacy for human-centred research agendas that foreground ethical and social implications.

5.4 Embedding Ethical Reflection in Pedagogical Practice: Ethics should not remain an external policy requirement but become an intrinsic part of pedagogical design. Teachers should be trained to conduct ethical impact assessments of AI tools evaluating issues such as bias, data privacy, and inclusivity. Embedding ethical

reflection into classroom practice fosters critical digital citizenship among both teachers and students.

AI ethics education should therefore be treated as a core competency across disciplines. By normalising ethical reflection, higher education institutions can cultivate a culture of responsibility and trust in technological innovation.

5.5 Promoting Global Collaboration and Local Adaptation: The global nature of AI development demands international collaboration in shaping ethical and pedagogical standards. However, these standards must be adaptable to local contexts. Universities in developing countries face distinct challenges, including limited infrastructure and capacity gaps. Therefore, global frameworks like UNESCO's must be localised through participatory processes involving educators and communities.

Regional networks and partnerships can facilitate knowledge exchange and resource sharing, enabling institutions to implement context-sensitive AI pedagogies. Such collaboration aligns with the principles of open science and the democratisation of knowledge.

Conclusion. Artificial intelligence represents both a challenge and an opportunity for higher education. Its integration into pedagogical and institutional processes demands not only technological proficiency but also ethical discernment, critical reflection, and professional agency. The UNESCO online discussion underscores the importance of positioning teachers at the centre of AI transformation not as passive recipients of technology but as active co-creators of its educational meaning.

Developing robust AI competencies requires a holistic framework encompassing technical, pedagogical, and ethical dimensions. Teacher education programmes must evolve accordingly, embedding AI literacy, governance awareness, and inclusive pedagogical principles into their curricula. Institutional governance structures must uphold transparency and accountability while empowering educators to exercise informed agency.

Ultimately, the humanistic vision of education must guide AI's role in higher education. The future of AI in pedagogy will depend on our collective ability to harmonise technological innovation with ethical responsibility and human-centred values. Only through such integration can AI contribute meaningfully to the realisation of equitable, inclusive, and transformative education in the 21st century.

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