EDUCATION AND ARTIFICIAL INTELLIGENCE

2nd International Scientific Conference

May 15/16, 2026

BOOK OF ABSTRACTS

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REINVENTING SCIENCE EDUCATION IN THE AGE OF ARTIFICIAL INTELLIGENCE: HUMAN FLOURISHING, EPISTEMIC JUSTICE, AND THE FUTURE OF LEARNING

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Abstract. Artificial Intelligence is transforming not only the tools of education, but also the epistemological, ethical, and civilizational foundations upon which education has historically rested. The question before us is no longer whether AI will enter schools and universities, but under what normative, pedagogical, and political conditions its presence may contribute to human flourishing rather than deepen inequality, dependency, and cognitive passivity. In the spirit of the conference theme: Building Human - AI Partnerships for the Future of Learning - this keynote argues that the future of education depends on our capacity to reconcile technological innovation with moral responsibility, scientific rigor with democratic values, and global progress with epistemic pluralism. Drawing from African, European, and Mediterranean experiences within the AEMASE III network, the keynote advances three interdependent propositions. First, AI in education must be conceived as augmentation of human intelligence, not substitution of the teacher or automation of judgment. Second, the governance of educational AI must be grounded in ethics, inclusion, and epistemic justice, particularly for regions historically marginalized in the global production of knowledge. Third, meaningful innovation requires transcontinental partnerships capable of co-designing pedagogies, curricula, and public policies responsive to cultural diversity and local needs. The keynote proposes a renewed humanism for the algorithmic age. It concludes that the most advanced educational systems will not be those that deploy the most powerful machines, but those that best preserve the dignity of learners, the creativity of teachers, and the emancipatory mission of education.

Keywords: artificial Intelligence; science education; epistemic justice; human-AI partnership; decolonial pedagogy; AI literacy; ethics of education

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ON INCREMENTAL LEARNING OF ARTIFICIAL NEURAL NETWORKS WITHOUT CATASTROPHIC FORGETTING

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Abstract. Incremental learning in artificial neural networks from a small number of examples, without catastrophic forgetting, has been one of the central challenges in artificial intelligence since the very beginning of this resarch field. The main goal is to enable models to continuously acquire new knowledge from a small number of training examples without forgetting what they have previously learned. In this paper, we will explore several complementary strategies that will bring us closer to a solution. The number of artificial neurons as processing units, how they are interconnected, and the synaptic weights, i.e., the strengths of the connections between them, represent the long-term knowledge of the neural network acquired during training. Solving the problem of incremental learning without catastrophic forgetting is essentially equivalent to addressing the so-called stability–plasticity dilemma. In other words, the learning algorithm of an artificial neural network must ensure that the network is capable of efficiently acquiring new knowledge (by adding new neurons and new synapses, as well as adapting synaptic weights), while at the same time it must not forget important knowledge acquired during training on previous examples. In this paper, we will explore several complementary strategies that will bring us closer to a solution. Parameter regularization implies that important parameters are changed minimally, thereby protecting prior knowledge. Functional regularization, often realized through distillation, seeks to preserve model outputs for earlier tasks. Memory approaches, such as replay mechanisms, further stabilize learning through the reuse of real or generated examples from the past. The adaptive architecture enables the growth of the network when necessary, but also the removal of redundant resources (pruning), which achieves better efficiency. The key component of all these methods is the mechanism of assessing the importance of knowledge, that is, the identification of those parts of the model that must not be significantly changed. Incremental learning without catastrophic forgetting requires a careful balance between preserving previously acquired knowledge and enabling the flexible integration of new information. No single method is sufficient on its own; instead, robust solutions emerge from the combination of parameter and functional regularization, memory-based strategies, and adaptive architectures with algorithms for growing and pruning both neurons and synapses, guided by reliable importance estimation mechanisms.

Keywords: incremental learning; catastrophic forgetting; stability–plasticity dilemma; regularization methods; adaptive neural architectures

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TOPICS

AI-Enhanced Teaching and Learning Environments

Generative AI, Creativity and Future Learning Paradigms

APPLICATION OF LOGISTIC REGRESSION IN PREDICTING STUDENTS' CHOICE OF STEM AND NON-STEM TRACKS

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Abstract. This paper examines the possibility of predicting students' choice of STEM and non-STEM tracks in grammar school by applying logistic regression to data collected through a questionnaire-based survey. The analysis was conducted on a dataset comprising 1044 students from four grammar schools in Kragujevac and Novi Sad. The target variable was defined as a binary classification of students into STEM and non-STEM track groups, while the input features included socio-demographic data, data on academic achievement, and students' responses related to school experiences and subject preferences. After data preprocessing, which included the transformation of categorical features, the treatment of missing values, and standardization, logistic regression was applied as an interpretable binary classification model. The results showed that the model successfully distinguishes between students in STEM and non-STEM tracks, with accuracy, precision, recall, F1-score, and AUC-ROC values of 0.823, 0.784, 0.793, 0.789, and 0.898, respectively. The analysis of the model coefficients also made it possible to identify the features that contribute most strongly to the classification. The findings point to the importance of school context, certain educational characteristics, and subject preferences in understanding students' choice of STEM and non-STEM tracks.

Keywords: students' choice of grammar school track, STEM tracks, logistic regression, educational data mining, prediction

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FROM IMAGE TO DECISION: DEVELOPING A MOBILE AI APPLICATION AS A MODEL OF INTERDISCIPLINARY LEARNING

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Abstract. This paper presents a model of interdisciplinary learning based on the development of a mobile AI application for image classification. The proposed approach connects several interdependent layers of an AI system, including image classification as an introduction to the basic concepts of computer vision, the use of both a pre-trained and a custom model, a Python backend as an intermediary communication layer, and a mobile application developed in the MIT App Inventor environment. Particular emphasis is placed on the educational potential of such an approach, which enables students to perceive artificial intelligence not merely as a ready-made tool, but as part of a functional digital system. The paper builds on contemporary approaches that emphasize AI literacy, project-based learning, and the interdisciplinary integration of content, and the proposed model can be regarded as a possible framework for introducing AI-related topics through concrete and functionally connected activities. The paper argues that such an approach has the potential to contribute to the understanding of fundamental AI concepts, the relationships among different components of an AI system, and the integration of knowledge from multiple fields into a coherent educational whole.

Keywords: artificial intelligence in education, interdisciplinary learning, image classification, mobile application, project-based learning

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AI BEHIND THE SCENES: THE USE OF ARTIFICIAL INTELLIGENCE IN THE ACADEMIC RESEARCH PRACTICES OF UNIVERSITY FOREIGN LANGUAGE TEACHERS

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Abstract. This study examines how university language teachers use artificial intelligence (AI) tools in conducting scientific research and writing academic papers. While existing research has predominantly focused on how teachers employ AI to support students in developing academic writing skills, far less attention has been given to teachers themselves as academic researchers and users of AI technologies. By shifting the focus from pedagogical mediation to professional research practice, this paper seeks to address this gap in the literature. Data were collected through an anonymous online questionnaire targeting university foreign language teachers in North Macedonia as well as colleagues from other countries worldwide. The instrument explores patterns of AI tool adoption, frequency and purposes of use, perceived benefits and limitations, and ethical considerations related to authorship and academic integrity. Particular attention is given to how AI tools are integrated into different stages of the research and writing process, including idea generation, literature review, drafting, editing, and referencing. The study aims to provide empirical insight into the evolving research practices of language scholars in the age of AI. By foregrounding university language teachers as active researchers, this research contributes to the emerging body of scholarship on AI in higher education and offers a more nuanced understanding of AI integration within contemporary academic research communities..

Keywords: artificial intelligence, academic research practices, foreign language teachers, AI-assisted writing, higher education

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NOTEBOOK-LM POWERED RESEARCH PARTNER APPLICATION FOR TEACHERS AND PROFESSORS

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Abstract. The rapid integration of artificial intelligence (AI) in education and research has introduced new tools that support knowledge organization, synthesis, and learning efficiency. This paper explores the educational and research potential of NotebookLM, an AI-powered platform developed by Google designed to assist users in analyzing and interacting with their own uploaded sources. Unlike traditional AI chat systems such as ChatGPT, NotebookLM operates primarily as a source-grounded research assistant, enabling users to upload documents, articles, and notes and generate summaries, insights, and structured knowledge based exclusively on those materials. The study examines how NotebookLM can support academic research, critical reading, and knowledge construction in higher education contexts. Using a descriptive and analytical approach, the paper reviews the platform's core functionalities, including automated summarization, question-answering based on uploaded sources, thematic organization of notes, and AI-generated explanations that remain anchored in user-provided materials. Particular attention is given to its potential to enhance students' research skills, improve comprehension of complex texts, and facilitate more efficient literature review processes. Findings suggest that AI-assisted platforms such as NotebookLM can significantly improve the management of academic information and support deeper engagement with scholarly sources. However, the study also highlights the importance of critical AI literacy, ethical use, and the continued role of human judgment in interpreting AI-generated insights. The paper concludes that NotebookLM represents a promising tool for augmenting research and learning practices in digitally mediated educational environments..

Keywords: artificial intelligence in education, AI-assisted research, NotebookLM, digital learning tools, academic research support, knowledge management

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AUTOMATIC QUESTIONNAIRE GENERATION USING RAG-BASED DOMAIN KNOWLEDGE EXTRACTION

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Abstract. Retrieval-Augmented Generation (RAG) is a technique that combines two components, retrieval and generation. The retrieval component fetches relevant information from external, typically domainspecific knowledge sources in various digital formats. This information is then provided to the generation component, which uses a large language model (LLM) to generate appropriate responses based on the retrieved content. RAG enhances the LLM's responses by augmenting the input context. This study explores the power of the RAG technique in a minor, low-resource, and highly inflectional language. A case study was conducted in the mathematical logic domain in Serbian. The aim of the study was to assess whether RAG is effective in generating questionnaires for an abstract knowledge domain in a language that is not prioritized during the training of the LLM. The key findings revealed several limitations of the proposed AI-based system when applied to formal logic material. Although the system successfully produces the required number and types of questions (Yes/No, multiple-choice, and short-answer), the overall quality of the generated content remains low. A significant portion of the questions is either trivial, unclear, or insufficiently precise. In several cases, the questions lacked clear semantic grounding in the source material, while others were redundant or poorly formulated. This issue was particularly evident in multiple-choice questions, where distractors were often either not meaningful or structurally incomplete. Overall, while the system demonstrates the ability to generate structurally diverse questions, the results indicate that substantial refinement is necessary in terms of semantic accuracy, linguistic quality, and handling input formatting.

Keywords: Retrieval-Augmented Generation (RAG), Large Language Models (LLMs), Automatic Question Generation (AQG), Education

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THE ROLE OF AI IN THE INTERPRETATION OF POETIC TEXTS

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Abstract. This paper investigates the role of Artificial Intelligence (AI) in the interpretation of poetic texts. The research specifically examines the interpretive frameworks applied to contemporary Macedonian poetry, comparing AI-generated readings with traditional human-authored analyses. By juxtaposing a humanistic, anthropological model against computational, intelligent software, the study evaluates the distinct qualitative traits inherent in both approaches to literary criticism. The analysis centers on the interpretive poetics of two seminal works: Seven Returns to the Aspen Motif (Sedum navrakjanja kon motivot trepetlika) by Gane Todorovski and Remembering Gjore (Sekjavanje na Gjoreta) by Blazhe Koneski. The primary objective is to delineate the fundamental differences between the human and digital models, assessing the efficacy of each. Thus, the paper addresses the critical question of whether AI can—or should—fully replace human interpretation, and what such a shift would signify for the future of the humanities. To facilitate this comparison, the study utilizes established analyses of Todorovski’s work by Vangelov (1993) and Angelevska (2025) as a benchmark against AI-generated outputs. Methodologically, the study employs analytical-interpretative, comparative, inductive, and hermeneutic frameworks.

Keywords: Artificial Intelligence (AI), poetics, analysis, interpretation, literature

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AI IN VOCATIONAL TRAFFIC EDUCATION - ASSESSING CHATGPT'S ACCURACY IN SOLVING DRIVING LICENSE EXAM TESTS

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Abstract. The emergence of artificial intelligence has been at the center of the scientific and technological world's attention for several years, although its existence dates back much further. Chatbots that exhibit human-like responses are used for a wide variety of purposes, ranging from everyday questions whose answers were previously sought through internet search engines, to complex software solutions. Although primarily designed for text generation, the popular application ChatGPT today also offers various ways of processing, extracting, and interpreting images. The purpose of this paper is to examine the accuracy of this most popular chatbot in solving tests from the website of the Association of Traffic Schools of the Republic of Serbia. The examples we used are employed in vocational traffic education for taking the driving license exam, and they include tests with purely text-based questions as well as combined text-and-image questions in the form of screenshots. In our tests, we found that ChatGPT answers questions with images far worse than questions of a textual type, making mistakes with illustrations of road situations as well as with complex intersections without traffic lights.

Keywords: artificial intelligence, ChatGPT, vocational traffic education, driving license exam, accuracy, image processing

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WHEN LEARNING BECOMES A SONG: THE USE OF THE AI APPLICATION *SUNO* IN ENHANCING STUDENT MOTIVATION AND CREATIVE EXPRESSION

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Abstract. The contemporary education system faces the challenge of modernizing the educational process through the integration of digital technologies and the development of competencies necessary for the 21st century. In this context, generative artificial intelligence represents a significant resource for improving teaching, particularly in the domain of interdisciplinary approaches, integration and correlation of currical content, and active student participation in the learning process. The aim of this paper is to examine the didactic potential of the Suno application in teaching, with special emphasis on the integration of school subjects and the promotion of an interdisciplirary and correlational approach. The use of this tool enables the connection of content from language, music education, science, and arts through the creation of educational musical content, thereby contributing to functional knowledge and more sustainable learning outcomes. The teacher play a particularly important role in this process as a mediator and creator of a stimulating learning environment, guiding students toward purposeful and critical use of artificial intelligence. In this way, students move beyond passive knowledge acquisition and actively engage in the learning process, developing creativity, digital competencies, and the ability to connect different fields of knowledge. The paper indicates that the use of AI tools in teaching contributes to simplifying and modernizing the learning process, increasing student motivation, and improving the overall quality of education. It is concluded that the integration of the Suno application represents a significant step toward building effective partnerships between humans and artificial intelligence, in fostering the development of modern and inclusive education.

Keywords: artificial intelligence, Suno, teaching, subject integration, interdisciplinary correlation, digital competencies, student creativity, active learning, modernization of education, student motivation

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AI-ASSISTED PEDAGOGICAL DIAGNOSTICS IN MATHEMATICS TEACHING AND LEARNING

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Abstract. The use of artificial intelligence–based tools (AI tools) is already well-established in mathematics education, and their role in the teaching process is becoming increasingly significant. Also, numerous tools applicable to mathematics education have already implemented various AI components. To date, scholarly inquiries have predominantly examined the influence of artificial intelligence on student academic performance, intrinsic motivation, and the overall efficiency of the learning process. Nevertheless, as these technologies undergo rapid evolution, sophisticated new avenues for their implementation have surfaced – most notably within the specialized field of diagnosing students' mathematical cognition. Advanced AI-driven instruments now facilitate the precise identification of recurrent error patterns and complex reasoning modalities through a meticulous analysis of student-generated work. This methodological approach, frequently characterized in contemporary academic literature as "AI diagnostics", or "AI-Assisted Pedagogical Diagnostics", allows for the derivation of data-informed recommendations. Such insights are significant for formulating targeted pedagogical interventions that enhance the quality of the learning experience. Accordingly, this presentation aims to demonstrate the practical capabilities of selected AI tools in analyzing the specific errors students encounter while solving different mathematical problems.

Keywords: AI, mathematics, pedagogical diagnostics, teaching

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USE OF AI-BASED DIGITAL TOOLS FOR CREATING EDUCATIONAL VIDEO CONTENT

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Abstract. This study adopts a practice-based approach to explore the use of artificial intelligence (AI)-based digital tools in education, with a focus on their application in creating educational video content. As AI technologies become increasingly integrated into teaching practices, there is a growing need to understand how these tools can support both educators and learners. The research examines tools such as text-to-video generators, image generation systems, and automated editing platforms, and evaluates their effectiveness in simplifying the explanation of complex topics. The methodology is based on practical experimentation and analysis of selected AI tools used in the creation of short educational videos. The results indicate that AI improves efficiency in content creation, reduces preparation time, and enhances student engagement through visually interactive formats. Furthermore, these tools encourage creativity and enable more accessible and modern presentation of information. The findings suggest that integrating AI into educational practices supports innovative teaching methods and improves learning outcomes, while also requiring responsible and ethical use.

Keywords: artificial intelligence, digital tools, education, video creation, learning innovation

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ENHANCING MEDICAL INFORMATION SYSTEMS TO UTILIZE LONGITUDINAL PRIMARY HEALTHCARE DATA FOR MEDICAL STUDENT EDUCATION

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Abstract. The study focuses on the repurposing of long-standing Medical Information Systems (MIS) in primary healthcare—specifically the MEDIS.NET system used in over 20 Serbian healthcare centers—as an underutilized repository of longitudinal patient data for medical education. The objective of this paper is to propose a specialized educational module integrated into an existing primary care MIS. The module aims to bridge the gap between theoretical medical curricula and real-world clinical practice by allowing students to analyze authentic, multi-decadal patient trajectories. It is hypothesized that: 1. Integrating real-world primary care data into a specialized MIS module will significantly reduce the gap between textbook knowledge and clinical complexity; and 2. AI-driven summarization and automated anonymization can effectively transform fragmented, high-volume longitudinal records into coherent, privacy-compliant educational resources without increasing the cognitive load on students. The research introduces a technical framework within the MEDIS.NET environment consisting of three core layers: (1) A Primary Care Query Engine for filtered searches (ICD-10, demographics, comorbidities); (2) An Automated Anonymization Layer to ensure strict data privacy; and (3) An AI-Driven Summarization and Semantic Synthesis component designed to distill 15 years of fragmented entries into a compact, longitudinal patient trajectory focused on clinically significant events. Preliminary findings indicate that exposure to real-world data from primary health centers enhances student understanding of multi-morbidity and the nuances of long-term chronic disease management. The results suggest that this scalable, cost-effective approach effectively repurposes existing healthcare infrastructure to create a data-driven learning environment, ultimately improving the competence of future physicians.

Keywords: medical information systems, primary healthcare, medical education, longitudinal data, case-based learning

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STUDENTS AS CO-AUTHORS: INTEGRATING ARTIFICIAL INTELLIGENCE INTO SUSTAINABILITY EDUCATION IN EARLY PRIMARY SCHOOL

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Abstract. This paper presents a case study of an innovative lesson implemented in a mixed-grade early primary classroom (Grades 1–3) integrating artificial intelligence to support sustainability-focused learning. The lesson “Healthy Food, Healthy Planet” served as the pedagogical framework for the research, within which AI-supported activities were implemented to explore their impact on students’ attention, motivation, and participation. The research question examined whether AI-supported, multimodal activities could enhance attention, motivation, and participation in early sustainability education. The methodology involved AI tools for co-creating song lyrics (Song Generator, Suno AI) and interactive game-based tasks (TApadlet Memory Tiles), adapted to each student’s developmental and literacy level. The teacher observed qualitative outcomes, focusing on engagement, interaction, and cognitive-emotional involvement. Results showed that students responded positively, demonstrating increased attention, active participation, and meaningful contribution. Co-creation promoted agency, while differentiated activities ensured inclusivity. At the school level, this was the first AI-supported sustainability lesson, demonstrating potential for pedagogical innovation and whole-school development. In conclusion, carefully guided AI integration can support human–AI partnerships in early primary education, enhancing not only cognitive learning but also emotional engagement, social collaboration, and responsible attitudes toward health and the environment. The study offers a replicable model for innovative, inclusive, and future-oriented sustainability education.

Keywords: artificial intelligence in education; sustainability education; early primary school; student engagement; human–AI partnership

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FROM A TOOL TO A PEDAGOGICAL PARTNER: ARTIFICIAL INTELLIGENCE AS A CO-CREATOR OF LEARNING IN CONTEMPORARY SCHOOLS

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Abstract. Artificial intelligence (AI) is increasingly reshaping contemporary education, moving beyond the role of a digital tool toward functioning as a pedagogical partner in teaching, learning, and assessment. This paper examines the integration of AI across different levels of formal education, including primary and secondary schooling, with implications that extend toward higher education contexts. However, a key challenge remains: how can schools integrate AI in ways that enhance educational quality while preserving human agency, ethical standards, and meaningful interpersonal interaction? The study addresses this research problem through the following questions: (1) What pedagogical potentials of generative AI—particularly ChatGPT—can support personalized learning and instructional differentiation? (2) What risks and ethical challenges emerge from the implementation of AI in everyday school practice? (3) Which principles may guide responsible human–AI partnership in formal education? The research applies a qualitative, analytical approach based on a structured review of recent scientific and professional literature, combined with a conceptual synthesis of pedagogical implications for contemporary schooling. The findings indicate that AI can significantly support teachers in instructional planning, generating differentiated learning tasks, providing formative feedback, and enabling more flexible approaches to assessment across diverse educational levels. At the same time, the results highlight important concerns related to information reliability, academic integrity, data privacy, digital safety, algorithmic bias, and the potential reduction of direct pedagogical interaction. The paper concludes that the educational value of AI depends on clearly defined procedures, transparent pedagogical goals, and the teacher's continuing role as a professional guide. Finally, it offers implications for educational practice and policy, emphasizing the need for systematic teacher training, institutional guidelines, and learner-centered AI integration that strengthens critical thinking rather than replacing it.

Keywords: artificial intelligence, generative AI, ChatGPT, personalized learning, human–AI partnership

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ARTIFICIAL INTELLIGENCE IN STUDENT LEARNING: HOW STUDENTS USE AI TOOLS IN STUDYING AND EXAM PREPARATION

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Abstract. The growing use of artificial intelligence (AI) tools has started to change the way students learn, organize study materials, and prepare for exams. Today, many students use AI not only to search for information, but also to better understand difficult concepts, summarize texts, generate examples, and check their knowledge. Because of this, it is important to explore how students actually use these tools in everyday learning and how useful they find them. This paper focuses on the role of AI in student learning, especially in the context of studying and exam preparation. The main goal is to examine how often students use AI tools, for what purposes, and what they see as the main advantages and disadvantages of this kind of support. Special attention is given to the use of AI for explaining unfamiliar terms, simplifying complex content, organizing notes, and helping students revise course materials more efficiently. The paper is based on empirical research that will be conducted among university students using a survey. The questionnaire will include questions about the types of AI tools students use, the situations in which they use them, how much they trust the answers they receive, and whether they believe AI helps them learn better. The research will also consider possible concerns, such as overdependence on technology, reduced independent thinking, and ethical issues related to the use of AI in education. It is expected that the results will show that students mostly use AI as a practical support tool in learning and exam preparation, especially when they need quick explanations, summaries, or help with understanding course content. At the same time, the findings may point to the need for stronger AI literacy and a more critical and responsible use of these tools in higher education. The paper contributes to current discussions on the relationship between education and artificial intelligence by focusing on students' real experiences and everyday practices, as well as on the broader changes that AI brings to contemporary learning.

Keywords: artificial intelligence, student learning, exam preparation, higher education, AI tools, studying, AI literacy

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ARTIFICIAL INTELLIGENCE IN ASSIGNMENTS AND ASSESSMENTS: THE CASE OF CLASSICAL PHILOLOGY IN SERBIA

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Abstract. Academic study of Greco-Roman antiquity, initially a 19th century philological study of Greek and Latin, has throughout 20th century evolved and expanded to include some neighboring disciplines (ancient history, classical archeology, etc.), some of which had since emancipated. Currently commonly referred to as Classics or Classical Studies, the essentially interdisciplinary field is now globally variously configured. For historical and institutional reasons, Classical Studies at the University of Belgrade remain firmly philological; the vast majority of courses, amounting to over 90% of ECTSs in undergraduate curriculum, require classical languages competence. For better or for worse, this has peculiar implications for the field's ability to incorporate and resist the fairly sudden influx of AI in knowledge acquisition and assessment. A recent survey shows that Classics students regularly rely on AI assistance in various assignments for working on original texts, while testing several AI services (in particular, reproducing a 2025 experiment) suggests the chatbots' increasing ability to perform those assignments. In this paper we re-evaluate the prospects of teaching traditional classical philology skills (consulting lexica, commentaries, secondary literature, translations, *apparatus criticus*, etc.) in light of advantages and shortcomings of traditional modes of assessment (oral examinations, on-site translations, etc.). We outline several proposals to design tasks for meaningful integration of AI assistance in achieving the designated learning outcomes while fostering students' independence in educational development: specifically, controlled experiments with AI's handling of textual assignments (lexical research, syntactical transformation, grammatical annotation, stylistic analysis, etc.) and comparative analysis of the process and results with those produced by using traditional reference resources through independent classroom activity. One of the goals of such supervised projects is to stimulate close awareness and critical evaluation of the mechanisms involved in source text research.

Keywords: AI, classical philology, textual assignments, controlled experiments, comparative analysis

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ARTIFICIAL INTELLIGENCE IN PLANNING SCIENCE WORKSHOPS: A COMPARATIVE ANALYSIS OF SCENARIOS DEVELOPED BY TEACHERS, STUDENTS, AND CHATGPT – THE CASE OF THE “SAVE WATER” PROJECT

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Abstract. The aim of this paper is to present and promote the project “Save Water”, implemented with the support of the Center for the Promotion of Science under the Ministry of Education. The project included a series of ten educational workshops intended for children from the first to the fourth grade of primary school, within which approximately one hundred experiments related to various properties of water were conducted. The experimental activities were designed in an interdisciplinary manner and encompassed content from the fields of chemistry, physics, biology, geography, and ecology, with the aim of stimulating scientific curiosity and fostering the understanding of natural phenomena through experiential learning. A particular segment of the paper focuses on a comparative analysis of the scenario of one selected workshop. The study compares the scenario designed by a teacher and students of teacher education with a scenario generated by an artificial intelligence system (ChatGPT). The analysis focuses on the structure of activities, methodological approaches, the clarity of experimental procedures, and the potential to encourage inquiry-based learning among children of early primary school age. The aim of this paper is to examine the possibilities of using artificial intelligence as support in designing experiment-based teaching activities, as well as to highlight the potential and limitations of such tools in the context of science education.

Keywords: water, experimental learning, natural sciences, workshops, artificial intelligence

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RAG-BASED SYSTEM FOR RUSSIAN PHONETIC TRANSCRIPTION FOR SERBIAN LEARNERS: A PILOT STUDY

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Abstract. This paper addresses the problem of the mismatch between written and spoken Russian, where the position of stress determines how vowels are pronounced information that standard transliteration does not convey to Serbian-speaking learners. The aim of the study is to design, implement, and evaluate a Retrieval-Augmented Generation (RAG) system that provides accurate phonetic transcription with stress marking and Serbian translation for any Russian text input, intended as a practical learning support tool. The hypothesis is that combining a rule-based phonetic engine with a knowledge base of stress-annotated lexical entries will produce measurably better transcriptions than applying rules alone without access to word-specific stress data. The system uses a ChromaDB vector database queried through multilingual sentence-transformer embeddings; a no-retrieval baseline isolates the contribution of the knowledge base, and an LLM-based judge evaluates semantic faithfulness more accurately than token-overlap heuristics, which were found to systematically underestimate quality. Results on 100 stratified examples confirm the hypothesis the RAG system outperforms the baseline across all metrics, with the largest gains on phrases where correct stress placement affects multiple vowels within the same input. These findings highlight the potential of RAG-based systems to support pronunciation learning in AI-enhanced language education by delivering context-aware and pedagogically meaningful feedback tailored to learners'.

Keywords: RAG system, phonetic transcription, Russian phonetics, ChromaDB, sentence transformers, Serbian

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BOOKS, THE INTERNET, AND ARTIFICIAL INTELLIGENCE AS SOURCES OF KNOWLEDGE IN TEACHING READING COMPREHENSION

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Abstract. In the contemporary educational context, reading and the development of reading literacy among younger primary school students increasingly take place in an environment that integrates both traditional and digital sources of knowledge. In addition to books as the primary resource in Serbian language teaching, students also have access to numerous Internet resources and tools based on artificial intelligence that can support the processes of reading and text comprehension. The aim of this paper is to examine the possibilities and challenges of using books, the Internet, and AI tools as complementary sources of knowledge in the teaching of reading and text comprehension in the lower grades of primary school. The paper is based on a review of relevant scientific literature and an analysis of methodological approaches that combine traditional and digital resources in Serbian language teaching. Particular attention is given to the potential of AI tools for explaining unfamiliar vocabulary, generating comprehension questions, and supporting individualized instruction. At the same time, the paper highlights the limitations and risks associated with the use of digital and AI-based sources, such as inaccuracies, superficial reading, and the need for critical evaluation of information. The findings indicate the importance of an integrated methodological approach in which the teacher plays a key role in guiding students toward the critical and responsible use of different sources of knowledge. It is concluded that combining book-based, Internet, and AI resources can contribute to the development of students' reading, digital, and media literacy when implemented through carefully designed instructional strategies.

Keywords: reading, reading literacy, books, Internet resources, artificial intelligence, Serbian language teaching

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ARTIFICIAL INTELLIGENCE AS SUPPORT FOR INDIVIDUALIZED LEARNING IN CLASS TEACHING

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Abstract. The application of artificial intelligence in modern education represents a significant challenge while simultaneously offering substantial potential for enhancing the instructional process. At the current stage of digital technology development, educational systems face the need to adapt teaching to the individual needs of students, where AI-based tools can play a significant role. Pedagogical literature emphasizes that artificial intelligence enables the adaptation of instructional content, learning pace, and methods of presentation to the individual characteristics of students, thereby achieving better learning outcomes. Such systems can analyze data on student progress and provide personalized feedback, which contributes to more effective monitoring of learning outcomes and the planning of instructional work. The aim of this paper is to highlight the positive effects of applying artificial intelligence in the process of individualized instruction during the first cycle of primary education. Available research indicates that the positive impacts of AI application in class teaching relate to supporting students in the process of independent learning. AI tools can enable customized tasks, automated feedback, and adaptive educational content tailored to the individual abilities and interests of students. Such an approach contributes to increased motivation, engagement, and learning efficiency, as students progress according to their own pace and learning style. At the same time, artificial intelligence can benefit teachers by assisting them in analyzing student progress data, planning differentiated activities, automating certain administrative and evaluation tasks, and creating interactive instructional materials. For artificial intelligence to be successfully implemented in the educational process, it is essential to provide adequate infrastructure, professional development for teachers, and a pedagogically purposeful use of digital technologies.

Keywords: artificial intelligence, class teaching, individualized learning, digital technologies, learning outcomes

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THE ROLE OF CHATGPT AS AN ARTIFICIAL INTELLIGENCE TOOL IN REDUCING STUDENTS' MATHEMATICS ANXIETY

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Abstract. Mathematics anxiety is a specific psychological condition manifested through feelings of uneasiness, tension, fear, and worry when dealing with mathematical content, particularly in situations involving problem-solving and knowledge assessment. This phenomenon can significantly undermine students' self-confidence, affect their motivation to learn, and lead to lower academic achievement. Overcoming mathematics anxiety requires an integrated approach that involves providing both emotional and cognitive support. This includes fostering a growth-oriented mindset, offering structured guidance through the problem-solving process, and creating a safe learning environment in which mistakes are accepted as a natural part of learning. In this context, artificial intelligence–based systems, such as ChatGPT, open up new possibilities for individualized student support. ChatGPT enables interactive learning through dialogue, adapts explanations to students' needs, and allows for repetition without time pressure or fear of evaluation. In this way, it contributes to reducing anxiety through several key mechanisms: lowering evaluative stress, normalizing mistakes, and gradually building self-confidence through successful task completion. The aim of this paper is to examine, through a qualitative analysis of examples involving solving equations and inequalities in the fourth grade of primary school, the potential of ChatGPT as both a didactic and supportive tool for students experiencing mathematics anxiety. Special attention is given to how the structure of interaction between the student and ChatGPT influences the emotional experience of learning and the student's willingness to engage in solving mathematical problems. The paper provides both a theoretical and practical framework for integrating artificial intelligence into mathematics education, with the goal of developing strategies that simultaneously support cognitive progress and emotional stability, thereby contributing to the improvement of the overall quality of the educational process.

Keywords: artificial intelligence, ChatGPT, mathematics anxiety, mathematics education

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE REDESIGN OF TEACHING STRATEGIES AND METHODS

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Abstract. The development of artificial intelligence (AI) has led to significant changes in educational systems worldwide. Digital instructional tools contribute to the emergence of new didactic models of teaching—characterized by technology-driven and, consequently, more optimized, adaptive, and individualized approaches to learning. The integration of intelligent tutoring systems, automated assessment tools, and decision-support systems enables the automation of certain teaching activities, the analysis of large volumes of educational data, more efficient monitoring of student progress, the implementation of adaptive teaching methods, and the personalization of learning. The aim of this paper is to analyze the impact of AI on didactic methods and teaching strategies, as well as to present the advantages, challenges, and future directions of educational development through the application of these technologies. The paper is based on an examination of theoretical concepts in contemporary didactics and the characteristics of AI applications in education, with the aim of improving the efficiency of the teaching process. The results of the analysis indicate that AI contributes to the individualization of instruction, enhances student motivation and engagement, and transforms the role of the teacher from a source of knowledge into a mentor and facilitator of learning. The digital transformation of the structure and dynamics of the educational process thus enables improvements in both learning experiences and instructional management. At the same time, the application of these technologies raises important ethical, pedagogical, and social issues that require responsible governance and continuous research. In this context, the ongoing professional development of teachers—particularly in acquiring competencies for integrating digital skills and developing a critical understanding of their pedagogical application—is essential. In other words, a meaningful “partnership” between teachers and AI increasingly implies education for the responsible and ethical implementation of AI in education.

Keywords: artificial intelligence, digital instructional tools, contemporary didactic strategies and teaching methods, personalized learning, teacher–AI partnership

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THE POTENTIAL OF AI-DRIVEN ADAPTIVE LEARNING SYSTEMS FOR ENHANCING THE QUALITY OF THE EDUCATIONAL PROCESS

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Abstract. The development of adaptive learning systems based on artificial intelligence (AI) represents a significant opportunity for improving the quality of the educational process. These systems enable personalized learning by adapting content, pace, and instructional methods to the individual needs of learners. By analyzing data on students' progress and learning styles, adaptive systems can promptly identify learning difficulties and propose appropriate interventions, thereby increasing the efficiency of knowledge acquisition. This paper examines the key advantages of AI-driven adaptive systems, including increased student motivation, continuous progress monitoring, and support for teachers in planning and delivering instruction. Particular emphasis is placed on the possibilities of their application in various educational contexts, as well as on challenges such as data protection, technical infrastructure, and the need to develop teachers' digital competencies. It is concluded that the integration of adaptive learning systems can significantly contribute to the individualization of instruction and the overall improvement of educational quality, provided that their implementation is carefully planned and accompanied by continuous professional development of teaching staff.

Keywords: artificial intelligence, adaptive learning systems, data analytics, personalized learning, quality of education, individualized instruction

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HUMAN-AI PARTNERSHIPS IN UNIVERSITY EDUCATION: A CONCEPTUAL FRAMEWORK FOR SUSTAINABLE NATURAL RESOURCE MANAGEMENT

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Abstract. Automation, and human creativity, significantly influences the transformation of contemporary university education. As a result of these shifts, new opportunities emerge for enhancing the educational process and developing innovative curricula. This paper aims to develop a conceptual framework for human-AI partnerships within university education, with a particular focus on the field of sustainable natural resource management. The study seeks to define the relationship between professors, students, and artificial intelligence systems to facilitate the development of innovative teaching programmes. The research is based on a qualitative analysis and a comparative review of relevant scientific literature concerning the application of AI in university education. The methodology further includes an analysis of the alignment between the educational objectives of the Republic of Serbia and the Strategy for the Development of Artificial Intelligence for the period 2025-2030, employing deductive methods within the context of sustainable natural resource management. The research findings indicate the potential for developing a hybrid educational model in which artificial intelligence serves as an analytical assistant for processing large datasets, while students assume the role of strategic decision-makers in resolving complex resource management issues. It is concluded that the innovation of existing curricula through the integration of artificial intelligence represents a pivotal step in the education of future experts, who will be equipped to develop critical thinking, ethical reasoning, and decision-making skills in order to address complex environmental challenges and ensure sustainable natural resource management in accordance with the demands of contemporary society.

Keywords: artificial intelligence, university education, sustainable natural resource management, human-AI partnerships

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TOPICS

Ethical, Legal, and Social Implications of AI in Education

AI Literacy and Teacher Professional Development

AI AS A CO-AUTHOR IN SOCIAL SCIENCES RESEARCH: ETHICAL IMPLICATIONS OF GENERATIVE MODELS APPLICATION IN DETERMINING METHODOLOGICAL RESEARCH FRAMEWORKS

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Abstract. The practice of employing generative artificial intelligence (AI) models in scientific research has become increasingly common in recent years. The use of AI technology in scientific research remains a subject of academic debate, primarily due to the numerous ethical issues it raises. Thus, the application of AI at sensitive stages of the research process, such as the design of the research methodological framework, can raise concerns about authenticity and responsibility. The increasingly frequent reliance of researchers on generative models when formulating hypotheses, research aims and objectives further poses a challenge to research autonomy and accountability. In this study, the authors examine the ethical implications of using generative models when determining the methodological framework for social sciences research. The main research aim is to unravel whether generative models can be used as an ethically acceptable tool by researchers when determining the methodological framework of research. The research was conducted using an analytical method, through a review of relevant scientific and professional literature, as well as international and national documents containing ethical guidelines and principles for the development and implications of AI technology. This method is combined with data collection on the use of generative models via an anonymous questionnaire issued to researchers in a targeted, heterogeneous research community. This tool has been employed to examine the frequency of AI use in the research process. Also, researchers' awareness of the advantages and disadvantages of generative AI models, and their understanding of the ethical implications of their use in scientific research, were examined. The paper's contribution lies in proposing normative criteria for the responsible use of AI by researchers when designing methodological frameworks for social science research.

Keywords: artificial intelligence, ethical issues, research methodology, social science research

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ENTANGLED HUMANISM PARADIGM: FROM AI TOOLS TO CO-LEARNERS

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Abstract. The paper explores the paradigm of entangled humanism as a philosophical and pedagogical framework for understanding the partnership between humans and artificial intelligence in education. Starting from a critique of the traditional view of AI as a mere tool, it analyzes a conceptual model in which AI becomes a co-learner and epistemic partner in the process of knowledge creation. Special emphasis is placed on two concepts that emerge from the entangled humanism paradigm: human–AI pedagogical synergy and the hybrid concept of intelligence. It concludes that the future of education does not depend on how successfully we implement AI, but on how successfully we build synergistic relationships between human and machine intelligence, in which the whole becomes greater than the sum of its parts.

Keywords: entangled humanism, artificial intelligence in education, pedagogical synergy, hybrid intelligence, co-learning

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DIGITAL HABITS OF THE NEW GENERATION: EXAMINING THE FREQUENCY AND WAYS OF USING ARTIFICIAL INTELLIGENCE AMONG STUDENTS

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Abstract. The subject of this paper is to examine the extent to which students use artificial intelligence and for what purposes. The research was conducted in four schools, two primary schools and two gymnasiums. The research sample consists of 395 students, from the seventh grade of primary school to the fourth grade of secondary school. The aim of the paper is to explore students' digital habits regarding the use of artificial intelligence, as well as their attitudes toward its use in school. The questionnaire used in the survey included questions related to the frequency of artificial intelligence use, the purposes for which it is used, and students' views on its usefulness, the reliability of the information obtained, and ethical aspects. By analyzing the research results using a descriptive method, we can conclude that most respondents frequently use artificial intelligence, primarily for learning purposes, completing homework, and quick access to information. Students largely recognize the advantages of artificial intelligence, such as the availability of information and rapid access to it, but at the same time they express ethical concerns regarding the use of generated content and potential misuse. The conducted survey suggests that artificial intelligence significantly shapes the digital habits of younger generations. For this reason, it is necessary to develop awareness of the appropriate use of artificial intelligence in the educational system, with particular emphasis on digital literacy and the development of critical thinking..

Keywords: artificial intelligence, students, learning, school, educational system

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PROFESSIONAL DEVELOPMENT OF TEACHERS AI COMPETENCIES THROUGH PRACTICE-BASED WEBINARS

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Abstract. The growing integration of artificial intelligence (AI) in education highlights the need for teachers to develop competencies that combine technical skills, pedagogical application, and critical understanding. This paper explores how practice-based professional development webinars support the development of teachers’ AI competencies. The study is based on a series of large-scale online training sessions involving over 400 primary school teachers. A mixed-methods approach was applied, combining quantitative data from pre - and post - training questionnaires with qualitative feedback collected during the sessions. The results indicate an improvement in teachers’ self-perceived competencies in using AI tools for lesson design, student engagement, and the creation of interactive teaching materials. Participants also reported increased confidence, creativity, and readiness to integrate AI into their teaching practice. The findings emphasize the importance of hands-on activities and real classroom examples in effective teacher training. This paper contributes to the field by presenting a scalable model for teacher professional development and offers practical recommendations for fostering meaningful human-AI partnerships in education.

Keywords: artificial intelligence in education, teacher professional development, AI competencies, digital teaching tools, practice-based webinars

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TRUST AND SOCIAL ACCEPTANCE OF AI IN SCHOOLS: AI YESTERDAY, TODAY, TOMORROW...ARE WE READY?

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Abstract. Today, in the era of digital technologies, it is almost unthinkable to start various types of obligations and jobs without using the Internet. In educational systems, the Internet and everything it brings in combination with AI should facilitate the process of learning and acquiring knowledge. However, ready-made solutions and templates in solving problems and tasks that are set before students very often hinder the development of intelligence, both social and logical. This fact was described by neurologist Demurge in the book “The Digital Jerk Factory”. We certainly do not want to dispute the application of AI in the educational process, but to point out the need for great importance of education, primarily for teachers but also for students in the application of AI for positive purposes. We do not want today's “digital natives” to fall into another trap brought by something that they may not be ready for yet. AI can be a dangerous tool if not used in accordance with ethical principles and codes, which can cause discomfort for students. This paper aims to highlight ethical and social norms in the use of AI, as well as the importance of educating educators not only for the application of AI in education, but also for the education and training of students for life in the digital age. The paper is based on the author's experience in using AI, does not deal with research, but rather expresses the author's opinion on the methods and principles of using AI in teaching.

Keywords: AI in education; professional development of teachers, AI competencies, internet and artificial intelligence - security, ethical, legal and social codes

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WHAT DO STUDENTS IN THE REPUBLIC OF SERBIA THINK ABOUT THE USE OF GEN AI TOOLS IN THE TEACHING AND LEARNING OF MATHEMATICS?

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Abstract. *Generative Artificial Intelligence (GenAI) tools and their pedagogical applications in mathematics have become the focal point of extensive contemporary research. In the Republic of Serbia, students are increasingly using these technologies to support their learning processes, including problem-solving, exam preparation, and homework assistance. Consequently, this study aimed to investigate students' perceptions regarding the use of GenAI tools in mathematics instruction and learning. To analyze student opinions, a survey was conducted via Google Forms involving 1,171 participants, who were presented with the open-ended question: What is your opinion on using generative artificial intelligence tools in mathematics education? Data were processed using a thematic analysis of student statements. A total of 1,022 students provided responses, with 666 offering substantive qualitative insights. The findings indicate that around 62% of respondents hold a positive attitude toward the use of GenAI tools, while approximately 20% expressed cautious or mixed views. Around 14% reported negative attitudes, and around 4% indicated a lack of experience or perceived need for such tools. Notably, students with the highest academic grade in mathematics in Serbia (Grade 5) expressed significantly fewer negative views than their peers. In addition, attitudes varied by age group, with high school students demonstrating more favorable views than elementary school students. These findings suggest that mathematics instruction should place greater emphasis on the evaluation of problem-solving processes and on fostering students' critical perspective of GenAI tools.*

Keywords: generative AI, mathematics education, student perspectives, thematic analysis

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WHEN CLASSROOMS THINK: UNLOCKING THE POTENTIAL OF ARTIFICIAL INTELLIGENCE IN EDUCATION

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Abstract. Artificial intelligence brings classrooms to life. Students learn, create, and adapt in dynamic, personalized environments. This paper explores how artificial intelligence reshapes teaching, fosters engagement, and unlocks the full potential of education's future. In the context of accelerated digital transformation, this study addresses how artificial intelligence can theoretically and practically redefine teaching and school environments. Specifically, it examines the defining features of "intelligent classrooms" (adaptivity, personalization, automated feedback, decision-support), the evolving role of the teacher as mentor and learning designer, the need for new professional competencies, and ethical, social, and pedagogical implications (privacy, accessibility, digital equity). A theoretical analysis and synthesis of relevant scholarly literature in educational technology, digital pedagogy, and artificial intelligence supported learning was conducted. An interdisciplinary approach combined conceptual review of existing models, categorization of key dimensions (pedagogical, technological, organizational), and critical assessment of ethical and social concerns. Key characteristics of artificial intelligence-based learning environments are identified and elaborated: adaptive and personalized learning pathways, automated and contextualized feedback, decision-support for pedagogical practice, and integration of analytics tools. The study highlights the transformation of the teacher's role toward mentoring and learning-design and underscores the need for new digital and pedagogical competencies. Major risks are also identified, including privacy threats, unequal access, and potential pedagogical compromises if technology is deployed without appropriate pedagogical frameworks. A conceptual model of an artificial intelligence-based teaching environment is proposed that integrates technological affordances with contemporary pedagogical approaches, providing a theoretical foundation for design, implementation, and evaluation. The model emphasizes balancing technology and pedagogy, teacher training and support, and careful handling of ethical and social issues, serving as a basis for future empirical research and practical application in educational institutions

Keywords: artificial intelligence, learning environments, intelligent classrooms, digital pedagogy, personalized learning

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SHAPING THE FUTURE OF LEARNING: HUMAN ARTIFICIAL INTELLIGENCE PARTNERSHIPS IN EDUCATION FOR SUSTAINABLE DEVELOPMENT

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Abstract. In contemporary education, facing global challenges related to sustainable development and rapid technological transformation, artificial intelligence is increasingly emerging as a partner in knowledge construction, raising new pedagogical and ethical questions. Human artificial intelligence partnerships offer opportunities for personalized and inquiry-based learning, visualization of complex systems, and promotion of critical thinking, yet their effective integration depends on teachers' role as mediators. Research problems: How can human artificial intelligence partnerships support the development of critical, systemic, and responsible thinking within Education for Sustainable Development? What is the role of future teachers in mediating and shaping these learning processes? Methods: This paper employs a theoretical and conceptual analysis of contemporary literature in pedagogy, artificial intelligence in education, and Education for Sustainable Development. The analysis identifies pedagogical opportunities, challenges, and ethical considerations related to the integration of artificial intelligence tools in initial teacher education programs. Main results: Human artificial intelligence partnerships can enrich learning by fostering inquiry-based approaches, critical data analysis, and deeper understanding of complex ecological and social systems. Effective integration requires pedagogical mediation to prevent technological determinism and to maintain the teacher's central role in learning processes. Conclusions: Future teachers play a pivotal role in cultivating responsible and critically oriented human– artificial intelligence partnerships in education. Implications: The study emphasizes the need to integrate digital, ethical, and sustainability-related competencies into initial teacher education programs to support innovative and sustainable educational practices

Keywords: artificial intelligence in education, Education for Sustainable Development, future teachers, human artificial intelligence partnerships, sustainability competencies

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PRO ET CONTRA ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: WHAT HAVE WE LEARNT SO FAR?

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Abstract. Higher education is a civic institution whose purpose is embedded in broader goals of social development. Recent debates have highlighted potential benefits of artificial intelligence (AI) for higher education and public policy documents have responded by promoting curricula that prepare a workforce for a job market that requires knowledge of AI. This paper examines competing arguments regarding the role of higher education in the context of AI: one view treats higher education primarily as an instrument for accelerating AI adoption and workforce readiness; an alternative view emphasizes the reciprocal effects of AI on the aims, practices, institutional responsibilities and educational values of higher education itself. Drawing on policy analysis and literature review, the paper argues for a balanced approach that promotes AI-related competencies and critical approach to the potential social impact AI might have when being used in higher education. The paper offers a view of whether the existing regulatory framework for AI offers safeguards to preserve social development goals expressed through higher education. Recommendations for policy and research priorities are outlined.

Keywords: artificial intelligence, higher education, public policy goals

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WHAT SHOULD ECONOMICS STUDENTS LEARN? IDENTIFYING FOUNDATIONAL AND EMERGING QUESTIONS IN ECONOMICS USING GENERATIVE AI

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Abstract. This paper identifies and organizes a foundational Top-20 list of economics questions and a Top-10 list of economics questions for 2026 as a more forward-looking contribution. The research problem addressed in this study is how economics education can remain conceptually grounded while adapting to emerging technological and societal transformations shaped by artificial intelligence. We adopt a structured prompt protocol with Google Gemini. Methodologically, the study demonstrates how generative AI can synthesize and systematize ‘grand questions’ while retaining comparability with earlier work and contributing forward-looking insights. The Top-20 list clusters around growth, inequality, institutions, markets, inflation, externalities, human capital, and behavioral decision-making; The Top-10 list for 2026 highlights AI-induced labor changes, climate finance, digital regulation, remote work, demographic aging, CBDCs, tariffs, and resilience to shocks. Using a qualitative synthesis approach, AI-generated outputs were reviewed and conceptually aligned with established economic literacy frameworks. The outputs provide a practical framework for teaching, curriculum design, term paper assignments, thesis selection, and research agendas. The main results suggest that generative AI can meaningfully support the identification of core and also emerging disciplinary questions without replacing subject expert judgment. The findings imply that human–AI collaboration can enhance curriculum quality and support future-oriented economics education. Limitations include the non-exhaustive nature of AI-generated lists and the need for expert contextualization and periodic updating.

Keywords: economics education, generative AI, curriculum design, economics learning

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DEVELOPING AI LITERACY COMPETENCIES FOR FUTURE TEACHERS IN THE ERA OF ARTIFICIAL INTELLIGENCE

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Abstract. Artificial Intelligence (AI) is rapidly transforming educational institutions, profoundly impacting instructional practices, learning processes, and administrative decision-making. As AI technologies become increasingly embedded within global educational systems, it is no longer optional but essential for future educators to develop the competencies required for the responsible, critical and pedagogical application of these tools. In this evolving landscape, AI literacy has emerged as a cornerstone of modern teacher education. This paper explores the development of AI literacy competencies among future teachers, examining their overall readiness to integrate these advanced technologies into classroom practice. Beyond mere technical proficiency, the study explores the depth of their knowledge, their ethical stances and their subjective perceptions regarding the utility of AI tools in teaching and learning environments. While many students show enthusiasm for automation, there remains a significant gap in understanding the algorithmic biases and data privacy concerns inherent in these systems. Furthermore, the paper underscores the urgent need for a systematic integration of AI literacy into formal teacher training curricula. Rather than treating AI as an isolated technical skill, it should be integrated into pedagogical frameworks to support effective use. By promoting a proactive mindset, educational programs can prepare future teachers not only to respond to technological advancements but also to play a leading role in shaping digital transformation in education. The ultimate goal is to equip educators with the capacity to utilize AI as a facilitator of personalized learning while safeguarding the human-centered foundations of the teaching profession.

Keywords: artificial intelligence in education (AIED), teacher training, AI literacy, digital transformation, educational technology

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON EDUCATIONAL PARADIGMS

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Abstract. Research subject: This paper explores the transformative role of Artificial Intelligence (AI), particularly Large Language Models (LLMs), in the educational sector. Aim: The aim of this study is to analyze how AI influences educational paradigms through personalized learning and administrative automation. Hypothesis: The research is based on the hypothesis that AI enhances pedagogical efficiency while introducing challenges related to ethics and equity. Method: The study employs an analytical approach, examining adaptive learning systems and applications of more popular LLMs. Results: The findings indicate key benefits such as personalized learning paths and administrative automation. However, critical concerns are also identified, including academic integrity, algorithmic bias, and the "digital divide." The results suggest that while AI significantly enhances pedagogical efficiency, a robust ethical framework is essential to ensure equitable access and maintain the human-centric nature of teaching.

Keywords: large language model, artificial intelligence, educational paradigms, personalized learning, pedagogical efficiency

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SUPPORTING TEACHER–STUDENT COMMUNICATION IN AI-ENHANCED LEARNING: THE ROLE OF SCHOOL PEDAGOGUES

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Abstract. Artificial intelligence is no longer a thing of the future—it is already present in many primary school classrooms, often through tools like ChatGPT, educational chatbots, and automated writing assistants. While much of the discussion around AI in education focuses on technology, this paper shifts the attention to something more fundamental: communication between teachers and students. How does the presence of AI affect the way they talk, listen, and understand each other? And more importantly—who supports them in navigating this new educational reality? This paper explores the role of the school pedagogue in primary school settings, focusing on teacher–student communication within AI-enhanced learning environments. School pedagogues are professionals trained to support both teachers and students in areas such as interpersonal communication, conflict resolution, and social-emotional development. In a time when digital tools are becoming part of everyday classroom practice, their role may be more important than ever. The central question of this paper is whether pedagogues can help teachers and students integrate AI tools in a way that strengthens, rather than weakens, their relationship. The paper draws on existing literature from the fields of pedagogy, educational communication, and artificial intelligence in education. Rather than offering definitive answers, it aims to open a discussion on a topic that has so far received limited attention. Special focus is placed on the pedagogue as a mediator—someone who can help balance the use of technology with the need for authentic human interaction. The analysis suggests that the role of the pedagogue extends beyond technical support. More importantly, pedagogues can contribute to creating conditions in which AI serves as a tool for enhancing dialogue, collaboration, and mutual understanding in the primary school classroom. In this sense, they play a key role in building meaningful human–AI partnerships in education.

Keywords: school pedagogue, teacher–student communication, AI in education, human–AI interaction, primary school, educational technology

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REFRAMING CRITICAL LITERACY IN THE AGE OF ARTIFICIAL INTELLIGENCE: PEDAGOGICAL CHALLENGES AND OPPORTUNITIES IN CONTEMPORARY EDUCATION

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Abstract. This paper offers a theoretical examination of the relationship between critical literacy, education, and artificial intelligence (AI) in contemporary learning contexts. It addresses the central problem of whether established conceptions of critical literacy remain adequate in environments increasingly shaped by AI-mediated knowledge production. The paper is guided by the following research questions: (1) How does AI challenge traditional understandings of authorship, authority, and meaning-making? (2) What conceptual shifts are necessary to sustain critical literacy in AI-rich educational settings? and (3) How can critical literacy be rearticulated to account for algorithmic influence and epistemic complexity? Methodologically, the study adopts a conceptual and interpretive approach, drawing on interdisciplinary scholarship in critical literacy theory, educational philosophy, and AI ethics. Through critical synthesis and theoretical analysis, it examines key tensions between human-centered literacy practices and automated content generation. The analysis suggests that AI disrupts foundational assumptions of critical literacy by complicating notions of authorship, obscuring processes of knowledge construction, and embedding algorithmic biases within seemingly neutral outputs. These shifts expose limitations in traditional frameworks that prioritize human intention and textual analysis without accounting for machine agency. At the same time, the study identifies emerging theoretical perspectives that extend critical literacy toward greater emphasis on transparency, reflexivity, and ethical engagement with technology. The paper concludes that critical literacy must be reconceptualized as a dynamic, AI-aware practice that integrates critique of both texts and the systems that produce them. It proposes a theoretical framework that foregrounds algorithmic accountability and critical engagement with AI, i.e. critical AI literacy. The implications highlight the need for educators and scholars to rethink literacy education in ways that prepare learners to navigate and interrogate increasingly automated and opaque knowledge environments.

Keywords: critical literacy; AI; education; algorithmic bias; digital pedagogy; epistemology

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ETHICAL USE OF GENERATIVE ARTIFICIAL INTELLIGENCE IN ACADEMIC WORK

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Abstract. Contemporary discourse in everyday life increasingly reflects the growing influence of artificial intelligence across all domains of human activity. Opinions regarding its benefits and potential harms vary; however, this does not alter the rapid expansion of artificial intelligence usage—from trivial inquiries to complex, constructive tasks within various professional fields. We are witnessing a period in which artificial intelligence is expected to replace numerous administrative roles worldwide in the near future, potentially placing entire professions at risk. Whether we choose to acknowledge and accept these emerging circumstances or not, a new era is entering decisively and inevitably reshaping our reality. In fact, it is already here. What currently concerns modern society is the use—more precisely, the misuse—of generative artificial intelligence. While the development of generative AI is undeniably impressive, its ethical dimension does not keep pace with the speed of its advancement and application. As is often the case, technological progress and its rapid evolution are not accompanied by adequate education or the establishment of appropriate moral and ethical frameworks. This represents a critical issue that requires thorough and serious consideration. The creativity of generative artificial intelligence and the paradigm of future learning must also be examined from multiple perspectives in order to gain a comprehensive and objective understanding. Accordingly, this paper, which focuses on the ethical use of generative artificial intelligence in academic work, seeks to address the aforementioned issues..

Keywords: generative artificial intelligence, ethics, academic work

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PERCEPTION, ATTITUDES, MOTIVATION, AND FREQUENCY OF AI TOOL USAGE AMONG HIGH SCHOOL BOYS AND GIRLS: A QUANTITATIVE AND QUALITATIVE ANALYSIS

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Abstract. The development of Artificial Intelligence (AI) in education represents one of the most significant transformations in modern learning. AI tools are increasingly integrated into the instructional process, enabling personalized learning, greater access to information, and support for the development of students' creativity and critical thinking. Researching the perceptions and practices of AI use among high school students is essential for understanding how young people experience this technology and which factors influence their motivation and attitudes. To obtain a comprehensive overview, this study employed a mixed-methods approach combining quantitative and qualitative analysis. The quantitative component allows for a statistical assessment of the frequency of AI tool usage and the identification of differences based on gender and high school grade level. Conversely, the qualitative component provides a deeper understanding of students' perceptions, creativity, attitudes, and motivation, allowing for the interpretation of numerical data within a broader context. This approach is justified because quantitative data alone cannot explain the complexity of attitudes and motivation, while qualitative data without statistical support remains limited in its generalizability. The combination of both methods enables an integrated analysis that reflects both the objective frequency of use and the subjective perception of the students.

Keywords: artificial intelligence, students, education, motivation, creativity, attitudes, perception

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ANALYSIS OF TEACHER'S COMPETENCIES FOR THE USE OF ARTIFICIAL INTELLIGENCE IN TEACHING

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Abstract. Teacher competencies have always been, and will continue to be, a relevant research issue in pedagogical studies. Without a teacher who keeps pace with the times, the education system—and above all the teaching process—cannot be aligned with innovations; it cannot follow contemporary social development trends, nor can it keep up with students. It is a fact that in the past students followed the teacher, whereas in the modern era this relationship has changed, becoming reciprocal and dependent on technology. In the last decade, there has been a rapid expansion of research focusing on the integration of artificial intelligence and its tools into the teaching process through teachers' work. In line with current research trends in pedagogy, we examined whether primary and secondary school teachers self-assess as competent when it comes to artificial intelligence. The aim of this paper is to analyze the key dimensions of teacher competencies through examining: teachers' knowledge of artificial intelligence, their knowledge and skills for the pedagogical integration of artificial intelligence into the teaching process, the level of ethical awareness, practices of assessing the benefits and limitations of artificial intelligence, and human-centered evaluation and professional engagement. The results indicate that teachers possess a moderate to high level of competencies across the examined dimensions, suggesting the need for further research as well as practical implications for teachers.

Keywords: artificial intelligence, education, teacher, pedagogical integration, advantages, disadvantages

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PROFESSIONAL DEVELOPMENT NEEDS OF PRIMARY SCHOOL TEACHERS FOR AI INTEGRATION IN NATURE AND SOCIETY INSTRUCTION: EVIDENCE FROM SERBIA

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Abstract. The rapid advancement of artificial intelligence (AI) in education has created an urgent need for teacher professional development, yet little is known about the specific training needs of primary school teachers in this domain. This study examines the professional development needs and perceived barriers to AI integration among primary school teachers (N = 200) across five regions of Serbia. Data were collected through a structured questionnaire focusing on teachers' current AI familiarity, participation in digital skills training, institutional support, and self-assessed training needs. Descriptive analysis revealed that while 70.5% of teachers believe AI can enhance Nature and Society instruction, only 38.5% report any familiarity with AI capabilities in education. Participation in formal digital skills training was notably low (M = 2.74 on a 5-point scale), while the perceived need for additional training was the highest-rated item across the entire instrument (M = 4.01). Significant differences in training participation were found by age ($F = 6.104$, $p = .001$) and work experience ($F = 3.877$, $p = .010$), with teachers over 50 and those with more than 25 years of experience reporting the lowest levels of training engagement. These findings point to a clear gap between teachers' openness to AI and their actual preparedness, and highlight the need for differentiated, age-sensitive professional development programs that address the specific needs of experienced educators.

Keywords: professional development, artificial intelligence, primary education, teacher training needs, Nature and Society

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