

Students' Curriculum Preferences on Using Artificial Intelligence Applications in Higher Education

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Abstract

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This study focuses on the issue of students' attitudes on integrating Artificial Intelligence (AI) applications in the curriculum of the Preschool and Primary Education specialization from the University of Craiova, Faculty of Letters. Starting from our previous studies on curriculum preferences, we elaborated a special questionnaire, with the aim of identifying the sources of information on the use of AI in education, the ways in which the AI application are currently used by students, perceived utility and relevance in the curriculum, perceived advantages and disadvantages in the context of postmodern pedagogy. The results confirmed the relevance of the instruments used to analyze students' curriculum preferences and highlighted several different research directions on the potential application of AI in higher education curriculum.

1. Introduction

The issue of using AI in education has gained a lot of traction in the several years, especially after the launching of ChatGPT in late 2022. Consequently, given the importance of the AI phenomenon for education, economy, industry and other critical sectors of the society (and especially the risks associated with AI), it became increasingly apparent that it will be very soon subject to regulation.

European Union has also recently addressed this issue in a wider package of policy measures to support the development of trustworthy AI, with several components (AI Act, 2024):

- *The AI Act*, Regulation (EU) 2024/1689 with the aim of developing ‘harmonized rules on artificial intelligence’, which is the first-ever comprehensive legal framework on AI in EU and worldwide. According to the document, the aim of the rules is to ‘foster trustworthy AI in Europe’
- *AI Innovation Package*, consisting in a set of measures to ‘support AI startups and innovation’ (including access to supercomputers)
- The launch of *AI factories*, which are described as ‘specialized computing infrastructures and an organizational model designed to develop, train and deploy AI on scale’.
- *AI Pact*, which is a voluntary initiative aiming to support future implementations, engaging with all

stakeholders, bringing together stakeholders, providers and deployers to comply with the key obligations of the AI Act.

This comprehensive strategy of the EU is accompanied by an ambitious international digital agenda focused on several key priority areas (AI Act, 2024): secure and trusted digital infrastructure, essential to enable developments in critical sectors such as energy, transport, finance and health; emerging technologies, such as AI, 5G/6G, semiconductors, and quantum technologies; digital governance that fosters social cohesion, protects human rights and democratic principles; cybersecurity, to strengthen the cyber defense of our partner countries as a direct investment in the EU's own security; digital identities and Digital Public Infrastructure, towards mutual recognition arrangements with key partner that can simplify cross-border business and facilitate citizens' mobility; online platforms to continue promoting protection of children online, freedom of speech, democracy and citizens' privacy.

Given the importance of this issue for society in general and education in particular, this paper aims to understand the ways in which artificial intelligence is perceived by students (and in our case study, by students in preschool and primary education specialization). The representations of the students are



particularly relevant because they guide how they will incorporate AI applications in their professional practice. Also, our study is intended to be a part of a more complex set of curriculum investigations that try to understand how students from different specializations (bachelor students, master in different fields of study, doctoral students etc.) understand and appreciate the relevance of AI in education. The results of the study have also importance from the standpoint of curriculum development, particularly for the inclusion of AI application in a digital curriculum for the field of education sciences.

2. Theoretical foundation

2.1. Systematic studies on AI in Higher Education

Several systematic reviews of the number of articles published in the scientific literature have demonstrated a great interest for AI and particularly for its applications in the field of education sciences (Kolhatin, 2025). One of the most well-known classifications of the aims in which AI systems can be used in higher education reveals five general areas of interest (Crompton & Burke, 2023):

- a) Assessment and evaluation
- b) Predictions
- c) AI assistants
- d) Intelligent tutoring systems
- e) Managing students' learning

Another excellent study on generative AI in teacher training identifies three general areas of studies: a) AI in pre-service teacher education; b) AI for in-service teacher education; c) AI literacy development. The same study also reveals four categories of benefits of using AI (particularly generative AI) in teacher training: a) enhanced teaching performance and efficiency; b) personalized learning and content creation; c) AI literacy and professional competence development and d) impact on pedagogical content knowledge and self-efficiency.

2.2. Systematic studies on curriculum feedback

Curriculum feedback is one important areas of curriculum research that has increasingly developed in the last ten years. In some of our previous studies, we have proposed several instruments that can be used to adequately measure students' curriculum preferences, from multiple criteria and perspectives (Strungă & Bunăiașu, 2013; Strungă, 2015). The field of curriculum feedback can be vastly improved, in our opinion, by using AI that can record students'

reactions, opinions, representations and performances in real-time, particularly in the context of learning management systems and virtual learning environments. The recorded information can also be automatically processed in order to strategically make improvements to the digital curriculum. The automated processes, based on AI algorithms can also serve as a new model for assisted digital learning, included in a more general curriculum framework.

2.3. Policy considerations on using AI applications in Higher Education

It is also important to note that the EU *AI Act* holds a risk-based approach, with several levels: unacceptable, high-risk, limited risk (AI systems with specific transparency obligations), minimal risk. According to the official document, using AI for 'emotion recognition in workplaces and education institutions' is an unacceptable risk. Also, in high-risk category are included: 'AI solutions used in education institutions, that may determine the access to education and course of someone's professional life (e.g. scoring of exams)'.

3. Research methodology

3.1. Objectives, hypotheses and variables

We started our study from several key objectives: a) Analyze students' attitudes on using AI in higher education, particularly preschool and primary school specialization; b) Analyze students' preferences on using AI application in curriculum (perceived utility for each subject); c) Understand students' motivation on using AI in learning and teaching; d) Understand the relationship between different variables (gender, use of ICT) and preferences on using AI.

We have identified the following hypotheses: a) The level of digital competences is directly correlated with a favorable attitude on using AI in education; b) Subjects' educational level and experience is positively correlated with favorable attitudes on using AI in education; c) Most of the students are familiar with AI use in education and are interested in taking a course about using AI in education; d) Most students agree that AI will have an important role in the teacher competences profile.

We operationalized the concepts used in the hypotheses by deriving the following variables: a) for the first hypothesis, we analyzed the correlation of two variables: 1) students' level of digital competences and 2) attitude towards the importance of AI in education, measured on a Likert scale with five levels; b) for the second hypothesis, we studied the correlation of two

variables: 1) students' educational level (bachelor, in the current case-study) and 2) students' attitude towards the importance of AI in education measured on a Likert scale with five levels; c) for the third hypothesis, we used as a variable students' self-reported experience in using AI and the level of interest to take part in a course about AI, measured on a Likert scale with five levels of interest; d) in order to study the last hypothesis, we used the variable of agreement on the relevance of AI for the teacher competences profile, measured on a Likert scale with five levels.

3.2. Sample

Since our case-study is an approach to optimize the digital curricula for Primary and Preschool Pedagogy specializations, we applied the research instrument to a sample ($N=172$), that included all the undergraduate students enrolled in the study program organized by University of Craiova, Department of Education and Communication Sciences, Preschool and Primary Education specialization. Consequently, the survey's results are representative to students from the University of Craiova, for the respective specializations. The average age of subjects participating in research was 19 years, 66,3% resided in urban areas and 33.7% in rural areas.

3.3. Procedure

The survey was carried out between June and September 2024. We included in this study students from the first, second and third year of their undergraduate training (primary and preschool specialization) using a convenience sample. Most of the questionnaires were completed using Microsoft Forms. The link for the questionnaire (as well as additional information and clarifications) was provided during the seminar activities for the subjects "Methodology of Educational Research" and "Theory and Methodology of Instruction".

3.4. Research instrument

To reach the research objectives, we constructed a questionnaire to identify students' attitudes towards AI in education, which includes 18 items grouped into the following categories: closed questions (17) and open questions (2). In terms of content items, the questionnaire aimed at accumulation of significant data on variables that have operationalized specific research hypotheses: Experience in using AI, in general (item 1); The degree of agreement to relevance of AI for individualized and personalized curriculum (item 2); Experience of using AI, in education (item

3); The degree of agreement towards the relevance of AI in teacher training (item 4); the selection and ranking of the most important educational area in which AI could be successfully implemented (item 5, 7); the degree of interest on using AI to develop educational content (item 6); Multiple selection of the most important challenges that face the integration of AI in education (item 8); Multiple selection of the sources of information on AI (item 9); The degree of interest toward the participation to a course on using AI in education (item 10); the degree of relevance of using AI for different subjects in preschool and primary education curriculum, for each academic year of study (items 11, 12, 13); the degree of agreement on multiple ideas on using in education (item 14); the frequency of using new communication and information technologies for individual study (item 15); residence environment (item 16); sex and gender (item 17); year of academic study (item 18). The questionnaire was constructed based on previous studies in the field of adult education, virtual learning communities and curriculum feedback (Strungă & Bunăiașu, 2013; Bunăiașu & Strungă, 2016) and intercultural education curriculum (Bunăiașu & Strungă, 2016).

3.5. Data Analysis Procedure

Using SPSS 25, we calculated the average age for the 172 subjects included in the curriculum for preschool and primary education specialization (3 years) from the University of Craiova and the age for all the subjects. To analyze the hypotheses, we calculated the Kendall's tau correlation coefficient for the variables (utility associated with using AI for professional development, internet usage, importance associated to AI, importance associated AI for professional development, background environment, experience in using information and communication technologies). We also calculated the general mean (GM) for the answers associated to the perceived importance of AI in teaching from the perspective of students from preschool and primary education specialization.

4. Results

Regarding the first two hypotheses, the statistical analysis confirmed that the students do indeed frequently use the new information and communication technologies (49,4% very frequently and 31,3% frequently). They also have a positive attitude towards AI and particularly the use of AI in education. For example, 66,2% of them consider that AI could help teachers personalize educational content

to a large degree. Also, most of the students greatly appreciate the relevance of AI for teaching (84,3%) and teacher training (80,7%).

Regarding the last two hypotheses, the research revealed several important findings: Most students are familiar with using AI (97,4%); Most students consider that AI could help teachers personalize the curriculum (31,6% very much and 35,5% a lot); Most students have already used an AI applications (30,3% frequently and 53,9% occasionally); 69,7% of students consider that AI should be a part of teacher training; Most students are very open to taking part to an AI course (46,1%); Most students consider that AI could help teacher better prepare for their career (59,2%).

We also asked the students which challenges they think are the most important in the process of AI implementation in the curriculum. Most of the respondents think that lack of specialized competences is the toughest challenge (34,9%), followed by issues related to ethics and confidentiality of information (31,3%) and limited access to technology (20,5%). Also, 20,5% of subjects indicated all the above problems.

On the issue of AI information sources, most of the students indicated that they got familiarized with the AI application on social networks (50,6%), with the help of colleagues and teachers (39,8%), personal experience and testing (27,7%), news and online articles (18,1%), university courses (14,5%).

It was also surprising to note that most of the students (43,4%) are very interested to participate in a course focused on using AI in education and 41% are interested. Almost all the respondents (95,2%) are interested and very interested to know how to use AI to generate educational content and materials.

5. Discussions

The results demonstrate a great interest for AI and particularly generative AI in education. The degree of interest could be partially explained by the emergence of the AI models in social networks, such as Facebook, Instagram and TikTok, which are used by many university students. This explanation is sustained by the number of students (50,6%) that familiarized with AI through social media. Also, only 14,5% of students got information about AI from university courses, which suggest that university curriculum (and professors) are not updating the curriculum with new information regarding AI. It is very surprising to find out that most students (95,2%) are very interested to take part in a course about AI. The results can be

explained by the students' direct exposure to AI models and application from informal contexts and by the recent trends of implementing AI capabilities by technology companies such as Apple (Apple Intelligence) and Google (Gemini service, which was scaled to many of the web-based solutions offered by the company. It should be noted that the University is actively using Google Workspace for Education as part of the informatization strategy. Another surprising results show that students are fully aware of the great advantages AI (particularly generative AI) can bring in teaching, understanding that the digital competences required for teachers should include an AI component. Taking into account these results, it is very clear that the curriculum should be updated to meet the need of using advanced AI models and applications in the teaching process.

6. Conclusions

The most important conclusion of the study is that there is a great potential of including AI applications in the digital curriculum offered by the University of Craiova. The students are aware of the importance of AI models and instruments in teaching and teacher training. One possible solutions is to organize several workshops and coursed at the university level in order to meet the level of interested manifested by the students. Another solution could be to develop a methodological framework of working with AI in higher education, particularly in the field of preschool and primary education specialization. The methods and techniques developed in the framework could be subsequently used in order to improve the curriculum. Another possible solution, derived from the research results could be to organize a research institute or professional association focused on encouraging the study of AI in education and particularly higher education. This avenue could be also used at national or European level, in the context of the European Digital Agenda and strategies on using AI. We suggest that these initiatives could also supported by the Digital Learning Environments Laboratory from the University of Craiova which has the required experience and staff (we referenced the previous studies in the field of virtual learning communities, learning management systems). We also outlined several research directions: analyzing the possible implementation of AI in smart devices such as wearables; analyzing the possibility of using AI to generate personalized and individualized curriculum experiences in the context of learning management systems; developing a framework of AI competences in the more general digital competences for teachers'

framework; the necessity of exchanging best practices in the field of using AI in higher education.

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References

- Bunăiașu, C.M., Strungă, A.C. (2016) Perspectives and modalities in order to develop the didactic staff's intercultural competences. *Social Sciences and Education Research Review*, 3(2), 2016, 24-35.
- Crompton, H., & Burke, D. (2023). Artificial intelligence in higher education: the state of the field. *International Journal of Educational Technology in Higher Education*, 20(1). <https://doi.org/10.1186/s41239-023-00392-8>
- Helberger, N., & Diakopoulos, N. (2023). ChatGPT and the AI Act. *Internet Policy Review*, 12(1). <https://doi.org/10.14763/2023.1.1682>
- Mah, D., & Groß, N. (2024). Artificial intelligence in higher education: exploring faculty use, self-efficacy, distinct profiles, and professional development needs. *International Journal of Educational Technology in Higher Education*, 21(1). <https://doi.org/10.1186/s41239-024-00490-1>
- Kolhatin, A. O. (2025). Generative artificial intelligence in teacher training: a narrative scoping review. *CTE Workshop Proceedings*. <https://doi.org/10.55056/cte.920>
- Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024. Laying down Harmonised Rules on Artificial Intelligence and Amending Regulations. (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU)2020/1828 (Artificial Intelligence Act), 13.06.2024, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R1689>
- Strungă, A.C., Bunăiașu, C.M. (2013). The investigation of the curricular preferences of students from primary and preschool pedagogy specialization. Premises for a model of action and socio-pedagogical intervention. *Review of Research and Social Intervention*, 40, 61-77.
- Strungă, A. C., (2015). The Integration of Virtual Learning Communities into Universities' Knowledge Management Models. *Procedia - Social and Behavioral Sciences*, 197/2015, 40(1), 2430-2434.