ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION ENVIRONMENT - CHALLENGES AND PERSPECTIVES

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Abstract
Artificial intelligence instruments are fully developed and increasingly present in various fields, including education. There has been a strong dynamic of artificial intelligence in recent years, and a growing concern among university management to analyze how artificial intelligence could help both teachers and students in the learning process. The challenges regarding artificial intelligence exist at every educational level, but in this pilot research study, the educational process in higher education within the university environment was chosen. The purpose of the pilot research study is to discover the receptivity of teachers and students to the integration of artificial intelligence in the educational process. The main objectives are: to identify the factors that influence the use of artificial intelligence in their activities; to discover the causes that determine reluctance towards artificial intelligence tools; to learn the risks and the benefits of integrating artificial intelligence into the educational process and to find out the main changes needed for using artificial intelligence instruments to improve the effectiveness of the teaching and learning process.
The paper is based on a pilot research study conducted in the Faculty of Administration and Public Management from the Bucharest University of Economic Studies. The research sample consists of 46 full professors and associated teaching staff. The main research instrument is the questionnaire developed and administered online through the Google Forms platform. Data processing and analysis are carried out with JASP. The results reflect the degree of receptivity of teachers regarding artificial intelligence tools, the main benefits and risks estimated by integrating these tools into the teaching and learning process. The results can contribute to changing the content of some curricula, teaching and learning methods, involvement of teachers in influencing the quality of education and the effectiveness of teachers alike.

Keywords: artificial intelligence, higher education, teaching and learning process

1. INTRODUCTION

In today's era of digitalization, artificial intelligence instruments are in full development and increasingly present in various fields. Among the sectors facing challenges of AI expansion are higher education (Pokrivcakova, 2023). There has been a strong dynamic of artificial intelligence in recent years and a growing concern in university management to analyze how artificial intelligence could help both teachers and students in the learning process. Studying the research of several specialists, Pokrivcakova (2023) states that the impact that AI can have in higher education consists of: changes in teaching methods, provision of personalized educational content according to the needs of higher education, improvement of management of education services, along with increased accessibility to education. The challenges regarding artificial intelligence exist at every educational level. Managers and professors are concerned on the one hand with providing quality educational services and on the other hand with properly adapting to this dynamic of AI that produces a series of changes, including the evolution of the teaching career. Managers and teachers must also find the most optimal solutions to keep students' attention to classes and their active involvement in solving work tasks, especially in today's days when the phone has become an essential device for access to any information for which, especially young people, have developed an addiction (Findlay, 2023). The use of artificial intelligence-based systems in universities can change the quality structure of educational services, but also the structure of the workforce. An AI robot that can provide information and help with administrative tasks at any time at no extra cost will reduce the need for new administrative staff (Popenici & Kerr, 2017). Findlay (2023) also argues that AI-based technology and information addiction are driving a process of change, influenced by the consumption of information and the convenience of quickly getting the answer to any question.

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Thus, it becomes important to know the degree of openness of the professors regarding the use of AI-based applications in education, but also how they can do this so as to minimize as much as possible the negative effects that the widespread use of technology could produce. This paper represents a pilot research study in which the educational process in higher education within the university environment was chosen.

2. LITERATURE REVIEW

Fitria (2021) explains Artificial Intelligence (AI) as a technological process of shaping human thought and designing a machine (robot, digital platform, application) capable of thinking like a human, understanding logically and making decisions.

The development of AI, as well as its integration into as many areas as possible, is considered one of the deepest concerns for technological progress in the last decade (Gunkel, 2022). Today's rapid development of AI platforms, alongside the fact that we are living in an era of digitalization, requires that the education sector adapts to provide quality (Fitria, 2023) and attractive educational services for the new generation of young people. Besides, whether teachers are already ready or not to reorganize their activity, AI is increasingly entering the education sector (Fitria, 2023) through the development of robots and various applications designed to facilitate learning and teaching processes. Also, as social networks are becoming more varied and attractive to young people, teachers must look for ways to keep students attentive and engaged in classes (Khang, Muthmainnah, Seraj, Al Yakin, Obaid, 2023).

Thus, the concept of artificial intelligence in education (AIEd) was developed, defined as an interdisciplinary field aimed at the use of artificial intelligence in the learning process of young people, in the training of teachers and in improving the educational system (Chen et al., 2020; Holmes et al., 2019; Hwang et al., 2020; Ouyang & Jiao, 2021, cited by Xu & Ouyang, 2022).

Recent studies highlight that AI can present both advantages and disadvantages for public administration and for teachers and students who use it in specific educational activities. Among the benefits of using AI in education are the fact that AI applications and platforms can improve teaching and learning processes, personalizing the learning process according to the needs of the student and support teachers to motivate and evaluate students (Androniceanu 2024a,b; Al-Tkhayneh, Alghazo & Tahat, 2023; Androniceanu, 2023). On the other hand, among the risks of using AI in the education sector are unequal access to technology and devices, as well as the risk of privacy violations (Borbo, 2024).

Also, regarding how teachers integrate AI into educational activities, Gunkel (2012) highlighted in his paper that for professors, there are several challenges in designing and facilitating how students collaborate with AI in the learning process. There have also been concerns among teachers that AI could affect their job security, this risk requires adjustments to the way teachers work as AI increasingly penetrates the field (Zhai et al., 2021). On the other hand, Chan & Tsi (2024) consider that the use of AI technology cannot replace the role of the mentor teacher in front of the students, because of the critical thinking and emotions that human teachers have. In the Nordic countries, AI applications are widely used in teaching and learning activities, from primary to university level, in exercises, explaining and understanding various concepts, as well as in assessment tests (Guilherme, 2019).

Among the AI platforms already developed to support educational activities carried out by teachers and students, there are: applications that identify the level of knowledge of students and support the learning process by personalizing content dedicated to students; virtual assistants that support teachers and students by sending reminders regarding activities that need to be completed soon; automated transcription and translation platforms that facilitate the translating of texts and papers in any language; applications for detecting plagiarism in papers; digital assessment platforms, through which teachers can assess the level of knowledge of students; gamification tools through teachers can attract and motivate students to learn and measure their level of knowledge; tools for processing numbers and data in a format that is as attractive as possible for students; videoconferencing platforms that support the organization of meetings between teachers and students in the online environment; learning management system through which teachers can create support materials, tests, monitor students progress and provide feedback (Owan, Abang, Idika, Etta & Bassey, 2023). To these are added AI-based Chatbots, one of the best known remains Chat GPT, Jasper or Google Bard.

Management Research and Practice
Volume 17, Issue 3 / September 2025

These platforms are ways that students can call to get answers in a very short time without waiting for the answer from a teacher (Kaplan-Rakowski, Grotewold, Hartwick & Papin, 2023).

However, the human factor plays a key role in the adoption of technology, and in the case of the use of artificial intelligence in education it becomes a more complex problematic as a result of the opinion that teachers have on how such technologies and robots work (Nazaretsky, Ariely, Cukurova & Alexandron, 2022), rather than on the advantages and disadvantages that they can bring to the educational process.

The use of artificial intelligence tools, especially Chatbots, is thought to be likely to negatively influence the quality of education services by reducing the possibility for teachers to provide emotional support and mentorship to students (Al-Mughairi & Bhaskar, 2024, p. 2). At the same time, these digital tools can also pose several challenges in terms of student-to-platform interaction. Student learning outcomes can be influenced by the emotions and attitudes they experience while using artificial intelligence (Khang et al., 2023). In their study, Nazaretsky et al. (2022) noted that if teachers acquire knowledge of AI and the results of the use of these platforms in education, then they will have greater willingness to use AI in activities with students. Similarly, Ng, Leung, Su, Ng & Chu (2023) consider that it is necessary to prepare teachers and train skills among them to use AI in the activities they have with students, taking into account the increased number of students using AI.

3. RESEARCH METHODOLOGY

This paper is based on a pilot research study conducted in the Faculty of Administration and Public Management at the Bucharest University of Economic Studies.

The purpose of this pilot research study is to discover the receptivity of teachers and students to the integration of artificial intelligence in the educational process.

The main objectives and hypotheses are:

RO1: Analyzing teachers' attitudes toward using AI tools in education. This objective aims to know the perception of teachers from the Faculty of Administration and Public Management regarding the use of AI in their activities. Identifying the link between attitudes, perceptions and the interest of teachers to use AI contributes to the proper integration of such applications in education (Celik, Muukkonen & Siklander, 2025). In this sens, the above-mentioned objective aims to verify the following hypothesis: ***H1: There is a relationship between teachers' perception of the impact of AI on the effectiveness of teaching and learning and their degree of openness towards AI.***

RO2: Identifying the factors that influence the acceptance and integration of AI in education. Considering the advantages and disadvantages of using AI, which can generate positive or negative emotions among teachers, the objective aims to verify the following hypothesis***: H2: There is a relationship between teachers' level of experience in using AI and their emotions generated by the use of AI.***

RO3: Exploring the perception of teachers about the impact of AI tools on the efficiency and quality of teaching and learning. Škobo & Šović (2025) argue that AI contributes to the efficient performance of administrative tasks, increasing the quality of teaching and learning environment. This pilot study aimed to know the opinion of respondents regarding the efficiency that AI can generate in education and to verify the following hypothesis: ***H3: Teachers who have integrated AI tools into their work have a positive perception about the impact of it on the efficiency and quality of teaching and learning.***

RO4: Identifying challenges and barriers to integrating AI into education. Online education has faced a number of challenges and barriers since its expansion imposed by the Covid-19 pandemic and these barriers continue to exist in the era of AI (Nagariya, Sharma, Saxena, Saxena, & Pancholi, 2024). For this purpose, it was desired to verify the following statement: ***H4: There is a relationship between teachers' age and their degree of openness towards AI.***

RO5: Designing recommendations for facilitating AI integration in education. Galindo-Domínguez, Delgado, Campo & Losada (2024) found a positive relationship between the level of digital skills of teachers and their positive perception of AI. Other authors have observed negative perceptions of AI among teachers generated

by students's use of AI applications in an unethical way (Sellnow, 2025). In this pilot study, the following hypotheses were verified: ***H5: There is a relationship between teachers' level of experience in using AI level of experience in using AI and their need for training. H6: There is a relationship between teachers' perception of AI and their intention to use plagiarism platforms to detect the level of AI in papers.***

The research sample consists of 46 full professors and associated teaching staff. The main research instrument is the questionnaire due to the fact that it allows the collection if quantitative data from a group of respondents in a short time. The questionnaire was developed and administered online through the Google Forms platform, to facilitate both its distribution to respondents and the collection and processing of data. The questionnaire includes two parts: I) 5 identification questions regarding the respondents; II) 11 questions regarding the degree of use of various AI platforms, the interest in such platforms, and the states and attitudes of the respondents towards AI. The questionnaire was distributed online during 05.03.2025 – 08.05.2025 to the 46 teachers from the Faculty of Administration and Public Management and obtained 22 responses, which represents a response rate of 48%. For the analysis of data and the realization of correlations between them was used JASP, the statistical analysis program of the University of Amsterdam. As the response rate was reduced and the data collected did not meet the normality hypothesis of the measured data, the Spearman correlation coefficient was used.

4. ANALYSIS AND RESULTS INTERPRETATION

The study's primary conclusions about Artificial Intelligence in the higher education environment among full professors and associated teaching staff in the Faculty of Administration and Public Management at the Bucharest University of Economic Studies are presented in the following section.

TABLE 1 – THE MAIN SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Item	Categories	Percent
Gender	Feminine	60%
	Masculine	40%
Age	25-30 years	10%
	31 – 35 years	10%
	36 – 40 years	15%
	41 – 45 years	20%
	46 – 50 years	10%
	51 – 55 years	10%
	56 – 60 years	20%
	Over 60	5%
Seniority in the institution	Less than 5	15%
	5 – 10 years	20%
	10 - 15 years	10%
	15 – 20 years	5%
	20 – 25 years	25%
	Over 25	25%
Hierarchical level	Management level	30%
	Execution level	70%

The majority of respondents are female (60%) and hold executive positions (70%). In terms of age, it ranges from 25 to over 60 years, and in terms of seniority in the institution, half of the respondents have over 20 years of experience in university education (Table 1).

Most respondents consider themselves to have a high (50%) or very high (25% of the survey participants) level of digital skills. 35% of respondents consider themselves to have a high level of knowledge of artificial intelligence tools applicable in education, and another 30% consider themselves to have an average level of knowledge of AI. 65% of the respondents have a good or very good opinion about the need to use artificial

Management Research and Practice
Volume 17, Issue 3 / September 2025

intelligence in academic activities. On the other hand, most respondents have a low or average willingness to pay a certain amount of money to use AI tools or additional features of such applications (Table 2).

TABLE 2 – AI SKILLS AND PERCEPTION OF AI AMONG RESPONDENTS

Item	Categories	Percent
Digital skills level	Very low	0%
	Low	0%
	Medium	25%
	High	50%
	Very high	25%
Knowledge level of AI tools	Very low	0%
	Low	25%
	Medium	30%
	High	35%
	Very high	10%
Perception on the need to use AI	Very poor	0%
	Poor	5%
	Medium	30%
	Good	45%
	Very good	20%
Availability to pay for the use of AI tools	Very low	25%
	Low	15%
	Medium	50%
	High	10%
	Very high	0%

TABLE 3 – CORRELATION BETWEEN THE PERCEPTION OF AI AND THE DESIRE TO USE AI

		Integration of AI tools in teaching activities	Availability to pay for the use of AI tools	Desire to use AI
Perception of the need to use AI in the educational process	Spearman's rho	0.576	0.053	0.366
	p-value	0.005	0.814	0.094
	Total number of respondents	22		

After analysing the correlation using the JASP statistical programme, it was found that there is a positive and partly significant correlation between respondents' perception of the need to use artificial intelligence in the educational process and the integration of such AI-based tools into academic activities (0.576) (Table 3).

As regards the correlation between respondents' perception of the need to use artificial intelligence in the educational process and their willingness to pay to access such tools or additional facilities offered by them, the Spearman correlation coefficient is positive but insignificant (0.053). A positive and slightly significant correlation (0.366) was observed between respondents' perception of the need to use AI and their desire to use such platforms in teaching.

Hypothesis 1 cannot be fully validated, as in general no significant correlations were observed between respondents' perception of the need to use AI in education and the other factors analyzed. Even if the resulting correlations are positive, they are not significant.

Analyzing the responses provided by respondents (Table 4), it was found that there is a positive but insignificant correlation (0.174) between the experience gained in the knowledge and use of AI tools and the feeling of agitation experienced by respondents when using AI. A positive and insignificant correlation (0.069) is also observed between the experience of using AI and the feeling of motivation regarding the use of AI.

On the other hand, there is a negative and partially significant correlation (-0.450) between the experience level in using AI and the feeling of fear that respondents experience when thinking about using AI in the educational

process (Table 4). Thus, a negative relationship was found between teachers' level of experience in using AI and their emotions generated by the use of AI. Thus, the lower their experience in using AI, the greater their fear about using AI and the impact of AI in education.

TABLE 4 – CORRELATION BETWEEN THE EXPERIENCE LEVEL IN USING AI AND EMOTIONS

		Agitation	Fear	Motivation
Experience level in using AI	Spearman's rho	0.174	-0.450	0.069
	p-value	0.440	0.036	0.762
	Total number of respondents	22		

TABLE 5 – CORRELATION BETWEEN THE LEVEL OF AI INTEGRATION IN ACADEMIC ACTIVITIES AND PERCEPTION ON IMPROVING THE EFFICIENCY OF TEACHING AND LEARNING BY AI

		Perception on improving the efficiency of teaching by AI	Perception on improving the efficiency of learning by AI
Level of AI integration in academic activities	Spearman's rho	0.522	0.317
	p-value	0.013	0.089
	Total number of respondents	22	

Analysing the correlation between the level of integration of AI platforms in the educational process and the perception of respondents regarding the impact that AI can have on improving the efficiency of teaching resulted in a Spearman correlation coefficient of 0.522, a positive and partially significant correlation. Between the level of integration of AI in education and the respondents' perception of the impact that AI can have on improving the efficiency of learning among students, a positive but slightly significant coefficient has resulted (0.317).

Hypothesize that teachers who have integrated AI tools into their work have a positive perception about the impact of it on the efficiency and quality of teaching and learning. It is partially validated due to the positive correlation coefficient, but it is not significant between the analyzed variables.

TABLE 6 – CORRELATION BETWEEN AGE AND DESIRE TO USE AI

		Desire to use AI	Availability to pay for the use of AI tools
Age	Spearman's rho	- 0.524	- 0.268
	p-value	0.012	0.228
	Total number of respondents	22	

Regarding the relationship between age and respondents' desire to use AI in academic activities (Table 6), it was observed that there is a negative and partially significant correlation (-0.524), which highlights the fact that if respondents are older, then it is more likely that they do not want to use AI. A negative but slightly significant correlation (-0.028) is also found between the age of respondents and their willingness to pay to use basic AI tools. Thus, there is a negative relationship between teachers' age and their degree of openness towards AI.

TABLE 7 – CORRELATION BETWEEN KNOWLEDGE LEVEL OF AI TOOLS AND THE NEED FOR COURSES/WORKSHOPS

		The need for courses/workshops
Knowledge level of AI tools	Spearman's rho	0.063
	p-value	0.781
	Total number of respondents	22

Following the analysis of respondents' responses (Table 7), it was observed that there is a positive but insignificant correlation between their level of knowledge of AI tools and their willingness to benefit from training courses or workshops on AI applications and their uses in education (0.063). Therefore, hypothesis 5 cannot be validated, the insignificant correlation illustrating that there isn't a relationship between teachers' level of experience in using AI level of experience in using AI and their need for training.

TABLE 8 – CORRELATION BETWEEN PERCEPTION OF THE NEED TO USE AI AND THE DESIRE TO USE AI DETECTION SOFTWARE

		The desire to use AI detection software in the papers
Perception of the need to use AI in the educational process	Spearman's rho	-0.057
	p-value	0.801
	Total number of respondents	22

Analysing the relationship between the level of respondents' perception of AI and their desire to use antiplagiarism systems to detect the use of AI in the students' papers, a negative but statistically insignificant correlation resulted (-0.057). However, the negative correlation reflects that among the respondents, there are people who have a negative perception and support the use of such software, respectively, respondents who have a positive opinion about AI and do not consider it necessary to use such AI antiplagiarism platforms. However, the hypothesis cannot be validated as a result of the fact that the correlation is not significant. So, a relationship was observed between teachers' perception of AI and their intention to use plagiarism platforms to detect the level of AI in papers.

5. CONCLUSIONS

Adapting to the digital era, where artificial intelligence applications are becoming more and more present, is a challenge for teachers across all education sectors, including higher education.Through this pilot research study conducted among full-professors and associated teaching staff of the Faculty of Administration and Public Management from the Bucharest University of Economic Studies, we aimed to know the degree of integration of artificial intelligence applications in the activities carried out by the respondents, as well as to identify challenges and factors that determine the use or avoidance of AI use in higher education.

This pilot study aimed to verify six hypotheses. Of these, hypotheses 2 and 4 have been validated, observing negative relationships both between teachers' level of experience in using AI and their emotions generated by the use of AI, as well as between teachers' age and their degree of openness towers AI. The other assumptions could not be fully and properly validated due to the small number of respondents and the insignificant correlations that resulted.

The relevance of this pilot study is the knowledge of the degree of the use of AI within Faculty of Administration and Public Management from the Bucharest University of Economic Studies, as well as the perception of teachers on the use of AI. Analysing of the answers collected through the online questionnaire it was noted that at the level of the investigated sample, AI platforms for the generation of educational content are not used, although most respondents have a good perception regarding the need to use AI in education services. The research results are thus important for understanding how AI-based educational platforms can be included in the academic environment, as well as for identifying the needs of teachers and addressing the challenges they face. In this sense, the present research can represent a support for adopting strategic management decisions in order to adapt the academic environment to the AI era.

6. LIMITS AND FUTURE RESEARCH DIRECTIONS

As previously mentioned, although the response rate using the JASP platform was reduced, it was found that there is a negative relationship between teachers' age and their degree of openness towards AI, and also a negative relationship between teachers' level of experience in using AI and their emotions generated by the use of AI. Considering this aspect, a future research direction is represented by analyzing other factors that have determined teachers' low interest in using various AI platforms with application in education. However, a research limitation remains the small number of respondents. Given that the response rate was only 48%, a higher number of respondents would have been needed so that the validity of the research would be higher. Another limit lies in the fact that, given the number of respondents, less than 50%, the research results cannot be generalized at the level of the entire Faculty of Administration and Public Management, nor the university.

In future research, we aim to expand the research base to other public administration faculties in the EU countries, to discover both the similarities and differences between professors regarding artificial intelligence tools usable in public administration education, but also to find out the most appropriate ways to efficiently integrate them both in teaching processes and systematic training programs for human resources in public administration institutions.

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