International Journal on Lifelong Education and Leadership (2024), 10(2)

Educational Innovation of Using Artificial Intelligence in University Education: a Comprehensive Student Survey

***Attila BALOGH*[1]**

[1]*PhD. Student, Óbuda University, Keleti Károly Faculty of Business and Management*
ORCID ID: 0009-0001-1078-6874
Email: balogh.attila@kgk.uni-obuda.hu

Abstract

This paper investigates the adoption and potential integration of artificial intelligence (AI) within higher education, examining its impact on educators and learners through detailed perspectives gathered from university students. It provides an extensive literature review outlining the dynamics, characteristics, and the application of AI in the educational sector. The primary research included a meticulously designed survey distributed among active students to assess their current experiences, perceived benefits, and concerns having AI-driven materials and tools in educational environments. Based on the learners' responses a generally positive attitude towards the use of AI was revealed among the university students. They expressed a strong belief in their ability to learn with and utilize AI tools effectively, acknowledging the significant advantages AI can offer in enhancing educational experiences and providing personalized academic support. This optimistic view is, however, tempered by significant concerns, particularly regarding ethical issues and the potential shift away from traditional pedagogical methods. The data also showed that the participants highly valued the effectiveness and accessibility provided by the AI-enhanced instructional materials and teaching methods. Despite this, there remained a substantial degree of apprehension surrounding the ethical implications and safety of AI applications in education. This paper makes a significant contribution to the field of educational technology by providing primary research on AI-related challenges and considerations. It highlights the critical importance of maintaining a balanced approach that prioritizes technological innovation alongside ethical considerations and human-centered practices in the development and integration of AI into higher education, advocating for responsible use of technology.

Keywords: Artificial intelligence, university education, innovation.

Introduction

The potential uses and concrete applications of artificial intelligence (AI) have already been explored in a wide range of industries and sectors (Anantrasirichai & Bull, 2022; Corea, 2019). Education is no exception, and with the ever-expanding and deepening use of digital technologies, the possibilities for using AI are becoming more diverse (Zhai et al., 2021). The study of the academic field and AI is of interest, given that the first four decades of the three paradigm-shifting development periods of AI since the 1950s, then 1950-1970, during the 1970s to 1990s and 1990s to 2020s, the majority of basic AI research was funded by the government sector and conducted by the education sector (European Commission. Joint Research Centre., 2020). Before deep diving into the specifics, it is beneficial to review the fundamental concepts and components of artificial intelligence (AI). A widely used scientific definition of AI refers to a field those studies and develops machines capable of intelligent behaviour, particularly systems that typically require human intelligence. Its main components are machine learning, natural language processing, robotics and computer vision. Machine learning enables systems to learn from experience while improving their performance, natural language processing focuses on understanding and generating language data. Robotics applies intelligent machines embedded in the physical world, and computer vision specialises in interpreting visual information (Russell & Norvig, 2016; Goodfellow et al., 2016). In 2018, Chassignol et al. published a study based on literature review focusing on the application of Artificial Intelligence and educational field, which distinguished four different types of impact: the creation of unique educational materials, the creation of innovative teaching methods, the development of technology-enhanced measurement systems, and the creation of new educational technologies (Chassignol et al., 2018).

Research Type: Article
DOI: 10.25233/ijlel.1528746

Received: 05.08.2024
Accepted: 05.12.2024
Published: 31.12.2024

Artificial intelligence in education has also undergone significant developments in the subsequent years, with notable advances in accessibility, feature sets, familiarity, and practice acquisition (Chan, 2023). The advent of AI in education has been the subject of considerable publicity, focusing being on the potential benefits for students, particularly in facilitating various examinations and written submissions (Sweeney, 2023). The perception of this has been that it will make the learners' work easier, and where appropriate, the results that can be achieved without learning (Cotton et al., 2024). As a result of this communication, the use of AI has been opposed by many educational institutions and, in several places, explicitly banned and sanctioned (Yu, 2023). Concurrently, this novel and continuously evolving technological approach using artificial intelligence as a technology platform is still in its infancy and is rapidly developing new uses and possible future applications (Yablonsky, 2020). Such an approach is highly pertinent to supporting students' education (e.g. disabled individuals) and enhancing learning effectiveness (Panjwani-Charania & Zhai, 2023; Paiva & Bittencourt, 2020). From another perspective, AI represents a high potential area for teachers and trainers (Celik et al., 2022). With the appropriate preparation and knowledge, these professionals can already provide considerable assistance in facilitating teaching, making teaching more accessible developing interactive and continuously feedback-based learning materials, courses and exams (Lameras & Arnab, 2021). Simultaneously, as with any new technology, the most crucial factor is communicating effectively before implementation, assessing existing knowledge, examining initial user attitudes, and having a conscious, adequately planned, and executed familiarization procedure and learning phase (Owoc et al., 2021). About the relationship between AI and education, in order to make the most effective, beneficial and responsible use of its potential, it is essential that both teachers and students, as well as institutions and regulators, collaborate in a continuous, joint and forward-thinking manner to identify the most appropriate approach to the use of AI, or, where necessary, to the appropriate limitation of certain of its functions and available services (Shao et al., 2020; Tan et al., 2022; Bond et al., 2024). The objective of this research is to comprehensively assess and analyse university students' attitudes toward AI, their opinions on its applications, and their current level of knowledge regarding AI technologies. This assessment was conducted through an extensive questionnaire to a diverse group of active university students from different academic disciplines. The survey aims to provide a deep understanding of the extent to which students perceive the use of AI to be acceptable in educational contexts, considering perspectives from both students and teachers. It explores students' beliefs about AI integration's potential benefits and drawbacks in their learning environments.

Literature review

AI and education can be reviewed using several different approaches. The most evident starting point is the overview of how adaptive learning systems have evolved, the usage of chatbots, how AI stepped into the analytics field, and how it has achieved significant development within automated administrative services. Another perspective is the pedagogical implications, having an enormous impact not just on the students' engagement but also on the teachers' part concerning teaching methodologies, techniques, and even teaching materials. Rather than getting into full details about the above topics, this research focuses mainly on the practical approach, challenges, and concerns of integrating AI into university education using a narrowed literature review methodology and a survey evaluation. A ten-element list of the key characteristics of AI's advantages and disadvantages in higher education summarizes the result and the comprehensive summary of the review of the academic works.

The literature review was performed based on Scopus database academic works. The research plan structure has been built upon the following structure: As a starting point, the documents result of using keywords search (TITLE-ABS-KEY (artificial AND intelligence*) AND TITLE-ABS-KEY (university*) OR TITLE-ABS-KEY (higher AND education*) AND TITLE-ABS-KEY (disadvantage*)) was used to conduct an analysis of the coverage of the topic, by number of academic works, trend. It was continued with additional Keyword searches for a) advantage* and b) disadvantage*, enabling the analysis of the explicit details of advantages/disadvantages within the document list. As a third activity, keyword occurrence extraction for a) advantage* and b) disadvantage* was performed to identify keywords associated with a) advantage* and b) disadvantage*. As a result, a list of the main characteristics of advantages and disadvantages of using AI in higher education was created and summarized using an in-depth literature review.

As of June 2024, 15,985 documents have been identified, showing almost continuously increasing numbers of published academic works since the earliest record in 1911. The period from 2015 onwards marks a significant phase of rapid growth in publications, as detailed in Table 1. In 2015, there were 320 publications. Based on interpolation from the existing data, it is estimated that by 2024, there will be 3,692 academic works indexed in Scopus, representing an astonishing 11.5-fold increase. Alternatively,

considering the year-over-year average growth rate of approximately 28.75% over the past ten years, the sustained growth of the publication corpus highlights a profound and enduring interest in the subject. This growth rate not only reflects substantial interest but also reflects the value and potential for future investment in research and academic works.

Furthermore, the scoping review focuses on the subject field's advantages and disadvantages, whereas the following qualification procedure has resulted in 735 documents for advantages and 111 documents for disadvantages.

Table 1. Scopus indexed publications in the given subject field for keywords: advantage* / disadvantage*

Advantage	No of documents	Disadvantage	No of documents
E-learning	72	Privacy	2
Active Learning	23	Quality Control	2
Teaching methods	17	Security	2
Distance Education	15	AI-ethics	1
Knowledge Management	13	AI-generated Content	1
Competitive Advantage	11	AI-reliability	1
Information Use	11	AI-transparency	1
Optimization	11	Accessibility	1
Efficiency	8		
Student Performance	7		
Evaluation	6		
Accuracy	6		

Source: Scopus.com database keyword occurrence analysis for the above given keywords

As shown in Table 1, based on the keyword occurrence analysis, a significantly low number of keywords identified directly linked to the advantages and disadvantages of using Artificial Intelligence in University Education. Notably, there is almost a seven times higher number of Scopus-indexed articles focusing on the advantages rather than the disadvantages of AI usage in higher education. Reviewing the respective articles and additional academic works, the following five advantages and disadvantages have been identified:

Table 2. Collection of main characteristics in the given subject field for advantages and disadvantages

Advantage	Disadvantage
1. Distance Education Option	1. Privacy and Ethical concerns
2. Enhanced Personalized Learning	2. Quality of AI generated content
3. Improved teaching, evaluation methods	3. Accessibility and equality
4. Improved administration	4. Technology reliability
5. Improved Student Services	5. Transparency

Source: reviewed articles, table: author's work

Advantages of AI in higher education

In examining the five top-rated advantage elements, it is essential to consider their strong interaction. However, it is also important to analyse some of the main features for all of them, as the focus required for each topic may differ depending on the specific institutional situation, course, or class. Furthermore, the study reveals that the usage of AI can be tailored to the individual learner level. One of the principal advantages of incorporating AI into the higher education environment, as evidenced by the findings of the scoping review, is the option of distance education. This structure for accessing remote educational materials and courses existed before the advent of AI, but there appears to be a significant connection between these two subjects. The distance learning option has evolved in response to the challenges derived from the global pandemic (Alqahtani & Rajkhan, 2020). The application of AI in education in distance and online learning environments has enabled universities to enhance efficiencies in institutional and administrative services (Sharma et al., 2019). From the perspective of students, it is claimed that AI support enables highly customizable learning services in hybrid, remote or e-learning environments, with no personalized connections with teachers (Gao et al., 2021). Personalized learning can be enhanced using several elements, which depend on the university's capabilities, the needs and opportunities of the student, and the institutional and government-regulated environment. The research identifies two main groups of building blocks: one set is related to the personalization of subject matter and learning

materials, and the other set is linked to the way of learning, structure, and framework. The first group, personalization, can be further enhanced with the help of AI, allowing for the creation of customized content for each student and class (Pratama et al., 2023). It is evident that the curriculum must continue to include the mandatory elements (Dečman, 2015). However, with the flexibility afforded using alignment possibilities to students' interest, base or prior knowledge, and progress, it is possible to create and utilize more engaging and relevant materials and to run courses and entire learning paths with increased motivation and retention (Bates et al., 2020; Huang et al., 2023). In conjunction with personalized content, personalized assessments are available when AI forms the basis of the learning system (Hooda et al., 2022). Artificial intelligence is a critical enabling technology for creating adaptive assessments that align with learners' knowledge levels and desired learning outcomes (González-Calatayud et al., 2021). It plays a pivotal role in maintaining interest and dedication through its ability to provide almost real-time evaluation and self-adjusting monitoring (Luan et al., 2020; Fernández Herrero et al., 2023).

The other set of advantages refers to the education framework, specifically the teaching and evaluation methods, the advanced semi-complete automated administration, and the perception of recognizable improvements in student services. From a teacher's perspective, AI can be seen as the greatest threat ever, an opportunity for evaluating teaching to the next level, or both simultaneously (Pedro et al., 2019; Kuleto et al., 2021). The risks and challenges referred to in the next chapter and the disadvantages of using AI in higher education are discussed. One great value of AI is the customization of subject materials compared to the invested time and resources needed (Ingavelez-Guerra et al., 2022). Having a good base material and a proper instruction set for an AI tool, the creation of customized, even personalized content is a matter of seconds. It not only offers differentiation in content but can also consider students' knowledge levels, preferences, and learning styles (Bajaj & Sharma, 2018; Al-Zahrani, 2024). The customization ensures that all learners receive the most relevant and supportive resources. Such personalization of materials led to enhanced student engagement, offering more active participation, better results, and a more profound commitment toward continuing studies (Ouyang et al., 2022). Over personalized course content with the help of AI, the whole educational system can be extended to an adaptive learning environment, actively seeking and responding to the needs of individual students (Maghsudi et al., 2021). The structure can adjust the pace, style, and content based on real-time analysis of learners' performance, feedback, and progress. Such adoption needs high-level automatization, continuous real-time grading and assessment system(s), learning analytics, and a data-driven approach within the university's operational model (Swiecki et al., 2022).

In addition to enhanced pedagogical techniques, an AI-driven educational framework offers innovative and high-performance evaluation methods. These methods introduce almost real-time, immediate response and result-generating tools, extensively utilising statistical models to evaluate individual students' knowledge levels against group averages over time (Jain et al., 2014). This profound understanding and management opportunity significantly enhances learning efficiency, which can only be achieved with an automated, data-driven approach. The possibility of utilising the same data set and processing tools allows for the measurement of the progress of individual students, as well as the development of groups or cohorts, against previous groups or predefined expectations. This capability automatically adjusts learning journeys, designed to meet specific objectives at both the personal and class levels (Somasundaram et al., 2020).

The data-based computerised and automated multi-layer information flows enable immediate responses and improved operational administration within the higher education sphere, which is accessible and usable for students, teachers, institutions, and even central government administration. The application of artificial intelligence in university education encompasses a range of functions, from automated admission procedures to enhanced collaboration options (Ahmad et al., 2022). AI-powered systems can be employed in scheduling and rescheduling classes, exams, and other university events and can even be used to monitor attendance. Regarding student services, AI can be utilized to provide personalized assistance through chatbots and AI assistants (Villegas-Ch et al., 2020). These systems can offer general support on a 24/7 basis and can also provide personalized responses to specific inquiries. Algorithms can assist scholars in analysing their performance, offering flexibility in creating and adjusting learning pathways (Vo et al., 2022). They can also proactively analyse expected results and provide additional supporting materials in subjects where extra investment is needed to achieve targeted grades and performance.

Disadvantages of AI in higher education

One of the most significant concerns regarding the utilisation of AI in any given field is the issue of privacy and ethical considerations, which must be addressed to ensure this technology's responsible and ethical use. All computerized systems require data, utilizing automated algorithms for status information,

process management, and self-improvement learning. The implementation of AI-based solutions in university education and operations exemplifies this. Such activities depend on extensive data collection, analysis, and production, resulting in a continuous and growing demand for data, including highly confidential personal data (Curzon et al., 2021; Nguyen et al., 2023). The potential for data breaches, data leakage and manipulation of data, and unauthorized access to databases containing personal, financial, and other information represents a significant risk to both students and institutions (Li et al., 2023). Furthermore, ethical considerations are also related to students' and teachers' awareness and explicit approvals regarding data collection and data usage practices. In this context, it is imperative that appropriate ethical standards and regulations, such as the EU GDPR, are adhered to (Jones, 2019). These require informed consent practices where all stakeholders are fully informed about how their data is used and protected. They are offered the option to accept or decline such personal data management processes. As with all forms of technology, AI systems are not infallible and may contain certain levels of bias. Such errors may derive from teaching data, test data, or even from the models themselves. Unfortunately, there is evidence that bias may lead to discriminatory practices. It is, therefore, of the utmost importance to ensure that the models and algorithms in question contain the least possible bias in critical fields and focus on preventing unfair treatment (Bonezzi & Ostinelli, 2021).

A further area of concern is the quality of the AI-generated content. As the utilization of AI for the creation, modification, and review of written and verbal materials and videos has expanded, it has become apparent that the quality and usability of such content can exhibit considerable variability. It has led to growing concerns about the accuracy, reliability, and consistency of the content generated by AI (Chen et al., 2023). As a program is constrained by the instructions it has been programmed to execute, the output is not only dependent on the algorithms but also on the programmer in a manner analogous to the role of the university teacher in the context of higher education (Ouyang & Jiao, 2021). It can be reasonably assumed that the more an instructor can program and initiate processes and work requests from AI, the greater the likelihood of achieving a high-quality and consistent output. It is currently not possible for AI-generated content to demonstrate the same depth of understanding or critical approach to a given field as that of a human professor. Furthermore, there is a potential risk that AI-based systems produce materials that are not fully aligned with the relevant academic fields, even if they provide misleading information. It is, therefore, of the utmost importance to implement continuous control and measurement procedures to check and adjust content to ensure its relevance and validity (Wu et al., 2023). As is the case in any field that affects human beings, the topics of accessibility and equality are of great concern in the academic environment. Adopting AI in higher education will inevitably further increase existing inequalities among students who lack equal access to knowledge, technology, and connectivity. These disparities must be subjected to rigorous examination, addressed and managed by institutions, with the provision of continuous support for any groups that may be disadvantaged. In addition, AI systems should be designed and used for the diverse needs of students, including those with disabilities (Mehigan, 2020). This situation necessitates utilizing assistive technologies and providing alternative formats for content consumption and creation. Furthermore, the issue of affordability is closely linked to accessibility, not only at the level of individual students but also in the context of a comparison between different universities and institutions. It is critical to address the potential outcomes of widening the gap between students of well-financed and limited resource-based universities by making AI tools more affordable and accessible for all.

The majority of AI is informatics, whereas technology is critical. Every system based on mechanics and computer logic has the potential threat of system failures, malfunctions, or even complete damage. The more critical educational factors and functions are dedicated to AI structure, the more significant the impact of the technological disruption can be in case of critical events. Institutes can handle this risk and build appropriate mitigation techniques by having robust, scalable, and DR-ready infrastructure, backup sites, and recovery procedures in place. The effective utilisation of AI tools and AI-backed procedures necessitates the presence of continuous technical support for learners, teachers, and administrators. Universities must invest in ensuring 7/24 accessibility to support in the form of infrastructure, such as a call centre, chatbot, service desk, and the provision of skilled personnel (Villegas-Ch et al., 2019). The user training aspect is arguably the most crucial of all the elements in the technology view. Teachers, students, and any party utilising AI tools must undergo proper and continuous training and skill development (Jurs et al., 2023). Such knowledge is necessary for even the most optimal system to perform at its full potential, the potential can be realised, and the likelihood of bias and misuse is increased. Finally, it is essential to note that two specific areas have emerged in AI: interpretable AI and explainable AI (XAI). Such expressions can be used to describe approaches, procedures, and tools that assist users in comprehending and interpreting the work of AI (Linardatos et al., 2020). Transparency is paramount for comprehending algorithms, decision-making processes, and outputs, thereby fostering trust in AI systems. Accountability

is also a significant aspect of transparency, encompassing who is responsible for the operations, decisions, and outcomes generated by AI tools and systems. The field of AI is complex, and, as with many other areas of AI, education is undergoing continuous improvement. Difficult discussions and debates accompany this. The guidance and essence of transparency refer to AI's ethical and inclusivity requirements, which generates a massive demand for well-defined ethical principles to be adopted by AI-driven systems. Such theoretical approaches must be rigorously introduced, maintained, and supervised, primarily through explicit governing policies (Cath, 2018).

Research methodology

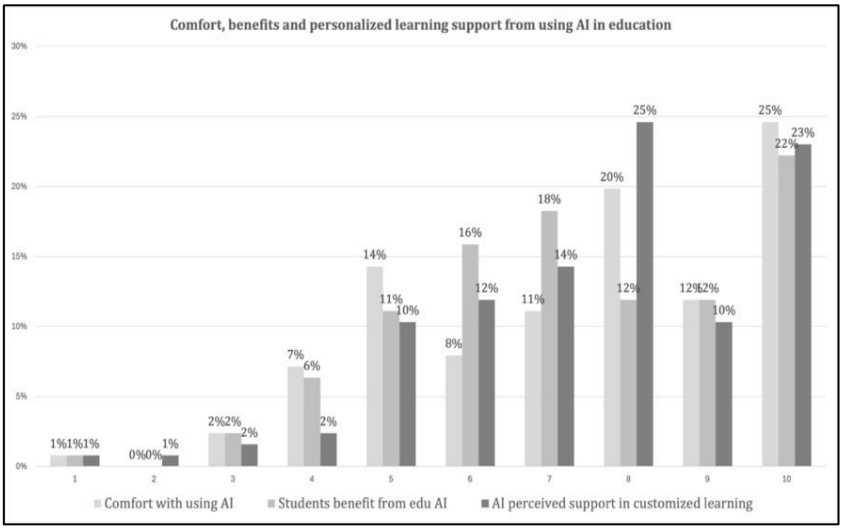
Above the formerly shown literature review research, a 15-item specific questionnaire was designed to assess students' attitudes toward AI, previous experiences, expectations, future beliefs, and possible concerns. Typical scaled questions ranged from 1 to 10, where 1 meant extremely disagree, 5 and 6 were considered neutral, and ten meant extremely agree. The scale has been divided into three categories: 1-4 rates: negative attitude, 5-6 rates: neutral attitudes, and 7-10: positive attitude. This structure allowed for the exploration of both positive and negative attitudes. 126 students completed the questionnaire from seven Óbuda University Keleti Károly Business and Management Faculty courses during class, including 32 international learners. The sample was limited due to its reach of learners, and the trade-off to using an anonymous questionnaire was the high number of fill-outs while giving off the exact demographics' evaluation possibility. It can be stated that the approached courses were 4 BA and 3 MSc, with first-year and second-year students. Their experience with AI tools was limited. The surveys were completed during in-person classes, with an introduction to the topic and information about the questionnaire. All participation was voluntary, questionnaires were anonymous, and informed consent was gained from the learners.

Besides descriptive statistics, an ANOVA analysis was conducted to reveal whether there are significant differences in the levels of further use and approach to AI between individuals with and without prior experience using AI in education. Due to space limitations, only the summarized version of the most important results is presented in this research.

Results and evaluation

Analysis of the survey data provided insightful findings about students' attitudes toward AI in education. Most importantly, students have a solid and clear opinion about the comfort level of using AI in their learning journey. Notably, 90% of all responses were neutral or above, with 25% of respondents falling into the 'extremely comfortable' zone. It indicates a high level of interest in the subject, even though almost half, 44% of students, have no experience using AI in an educational environment and, according to their perception, they have some knowledge about general AI technology. 91% of students thought they would benefit from using artificial intelligence tools and systems in the university environment.

Figure 1. Students' opinion on comfort, benefits and personalized learning support using AI in education
Source: author's research, n=126

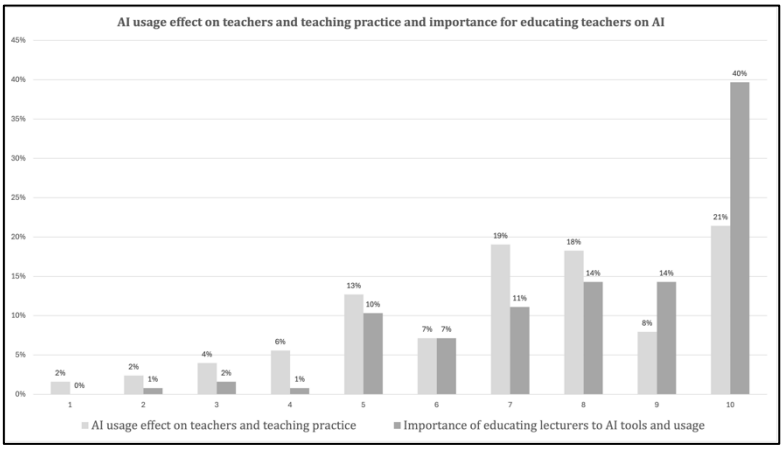


Focusing on the opportunities and benefits that AI would offer them, from a given list of items and open options, the results were: a) personalised learning experience 58%; b) increased student engagement 45%; c) improved learning outcomes 40%; and d) streamlined administrative tasks 33%. Interestingly, improvements in learning outcomes were only in third place, with data showing that students are more interested in personalised and engaged activities in their education. Asking about what the respondents think is a general attitude towards AI usage in education, based on the feedback, more than 92% of the scholars think that other university students would have at least a neutral attitude towards using AI in a classroom environment. This result strongly resonates with their behaviour towards the field.

ANOVA test was conducted to examine if former AI experience influences a) comfort in the use of AI in education, b) the perception of how participants see their self-adoption capabilities in using AI in education, c) AI's capability to support diverse education and d) their interest towards learning more about AI. There were two main outcomes. First, the means for the investigated factors were all above 7, showing that the participants have overall positive attitudes towards AI. The second result was that the students' former experience with AI had a statistically significant impact on the other examined factors with an extremely low p-value ($P=3.47\times10^{-130}$), supported by the F-statistic of 208,83 and the large effect size ($\eta^2=0.628$). Based upon the above, it can be confidently stated that prior AI experience plays a significant role in further comfort in using AI, future self-adoption perception to AI-support educational environment, AI's capability to support diverse education, and the interest towards learning more about AI.

As university educational measurements and learners' results are also highly related to the teacher's and lecturers' skills, knowledge, and educational framework, the questionnaire also tapped into this topic of AI usage. Almost three-quarters of survey participants indicated that AI usage would positively impact teachers' and teaching practices, out of which almost 30% voted for a highly and extremely positive effect level. Using a direct question regarding the importance of introducing AI knowledge for the teachers to enable them to use it within classroom activities, 97% of the neutral and positive answers were registered, with 54% on the two highest scales of extremely and highly important. Those results are graphically presented in Figure 2 and show a strongly expressed requirement and message towards universities to arm teachers and teaching environments with AI capabilities and offer AI-backed-up materials, classroom activities, and related services.

Figure 2. AI effects on teachers, teaching and the importance of educating teachers about AI
Source: author's research, n=126

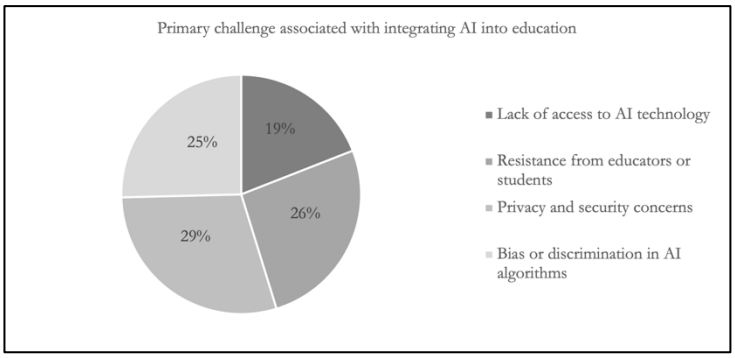


The research also asked for students' views on the challenges of AI within education. 92% reported that they would be able to adopt an AI-supported educational environment, 47% being in the upper quadrant of the scale with a strong positive attitude. Also, 94% think AI would help support diversity, inclusivity, and different learning requirements for students in their higher education. Participants had not differentiated the primary challenge of integrating AI into education to such extent as they have evaluated the need or the adoption rate of AI. The four different aspects of the challenges presented in Figure 3 were almost valued to the same weight, around 25% ranging from 19%-29%, where lack of access to technology was the lowest, strengthening the view that the Hungarian higher education system is seen to be able to provide the accessibility for necessary infrastructure and the highest score, 29% was about privacy and security concerns. That almost balanced approach reflects not having enough experience in the field from personal perspectives and a systematic awareness of all possible huge impact factors that

can influence AI use in universities and the general landscape. As of entering to the last chapter of the research focuses on the perceived adoption capabilities of the learners and the view on how AI would help in addressing learning gaps and provide support to students with diverse learning needs. 93% of answers reflected a neutral and high confidence within the participants that they could adapt to AI-driven educational environments. 94% of votes were neutral or optimistic about how AI can help inclusivity and support diverse learning needs.

Evaluating the briefly summarized results based on the novelty of the extensive use of AI tools and methods in higher education, future studies should evaluate the long-term impact of AI integration on student performance and engagement, utilizing both qualitative and quantitative methods to capture a comprehensive picture. It would be also beneficial to conduct long-term research for observing the changes in student attitudes and learning outcomes over time, providing deeper insights into the evolving role of AI in education.

Figure 3. Primary challenge associated with integrating AI into education
Source: author's research, n=126



Conclusion

There are several key findings from the research. First, and perhaps most importantly, a significant majority of students, regardless that it can be stated that former AI experience is significantly influences other factors in using AI, expressed neutral to highly positive attitudes, with topping at an extremely positive peak towards the comfort and acceptance of AI usage. That result indicates an open-minded approach toward AI and predicts a possible acceptance of a seamless integration of AI in educational environments. The research proved that students view AI as a valuable tool in their academic journey, showcasing some specific scenarios and subjects where they believe AI can significantly enhance learning experiences and results, with an explicit answer of having strong confidence in adopting AI-driven educational environments. The research also revealed that students are interested in learning in artificial intelligence-supported classes and are eager to participate. Also, they firmly believe that AI would help with inclusivity and make students' progress easier with diverse learning needs. The main challenges associated with the field have not significantly differed; the survey also proved the main elements of advantages and disadvantages resulting from the literature review.

Turning the view onto the other side, the respondents expressed that AI usage would significantly positively affect teachers' work and recent educational practices. Most answers suggested that it would be essential to provide training for teachers about the efficient usage of artificial intelligence for applying it in classroom practices. This strong belief in the importance of AI knowledge for teachers reflects a recognition that effective AI integration depends heavily on educators being well-versed in these technologies. It immediately calls for professional development and teacher training to maximize the benefits of AI in the classroom.

This research, having built upon a comprehensive approach including actual literate review, identification of main advantages and disadvantages, and delivering a primary questionnaire research, provides insight into current student attitudes and helps understand the broader implications of AI in higher education. It ultimately alerts and showcases universities, institutions, and teachers integrating AI tools into their daily teaching operations. Operational fields have started to grow into an expectation from the learner's side. As AI is already within and outside the walls of educational institutions, the best solution is for universities to invest in understanding and evaluating the opportunities and challenges that

AI reveals. They must prepare themselves to step ahead with a proactive approach and implement immediate actions for integrating AI practices within and outside the walls of their institutions, as it is usually better to be in the lead than to miss the opportunity and fall behind in the competition for new students, satisfied learners and then Alumnus and better-performing organization.

Plagiarism Statement
Similarity rates of this article was scanned by the Turnitin software.

References

Ahmad, S. F., Alam, M. M., Rahmat, Mohd. K., Mubarik, M. S., & Hyder, S. I. (2022). Academic and Administrative Role of Artificial Intelligence in Education. *Sustainability, 14*(3), 1101. https://doi.org/10.3390/su14031101

Al-Zahrani, A. M. (2024). From traditionalism to algorithms: embracing artificial intelligence for effective university teaching and learning. *TECHNOLOGY, 2*(2), 103.

Alqahtani, A. Y., & Rajkhan, A. A. (2020). E-Learning Critical Success Factors during the COVID-19 Pandemic: A Comprehensive Analysis of E-Learning Managerial Perspectives. *Education Sciences, 10*(9), 216. https://doi.org/10.3390/educsci10090216

Anantrasirichai, N., & Bull, D. (2022). Artificial intelligence in the creative industries: A review. *Artificial Intelligence Review, 55*(1), 589–656. https://doi.org/10.1007/s10462-021-10039-7

Bajaj, R., & Sharma, V. (2018). Smart Education with artificial intelligence based determination of learning styles. *Procedia Computer Science, 132*, 834–842. https://doi.org/10.1016/j.procs.2018.05.095

Bates, T., Cobo, C., Mariño, O., & Wheeler, S. (2020). Can artificial intelligence transform higher education? *International Journal of Educational Technology in Higher Education, 17*(1), 42, s41239-020-00218–x. https://doi.org/10.1186/s41239-020-00218-x

Bonezzi, A., & Ostinelli, M. (2021). Can algorithms legitimize discrimination? Journal of Experimental Psychology: Applied, 27(2), 447–459. https://doi.org/10.1037/xap0000294Bond, M., Khosravi, H., De Laat, M., Bergdahl, N., Negrea, V., Oxley, E., Pham, P., Chong, S. W., & Siemens, G. (2024). A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour. *International Journal of Educational Technology in Higher Education, 21*(1), 4. https://doi.org/10.1186/s41239-023-00436-z

Cath, C. (2018). Governing artificial intelligence: Ethical, legal and technical opportunities and challenges. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 376*(2133), 20180080. https://doi.org/10.1098/rsta.2018.0080

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: A Systematic Review of Research. *TechTrends, 66*(4), 616–630. https://doi.org/10.1007/s11528-022-00715-y

Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. International *Journal of Educational Technology in Higher Education, 20*(1), 38. https://doi.org/10.1186/s41239-023-00408-3

Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial Intelligence trends in education: A narrative overview. *Procedia Computer Science, 136,* 16–24. https://doi.org/10.1016/j.procs.2018.08.233

Chen, C., Fu, J., & Lyu, L. (2023). A Pathway Towards Responsible AI Generated Content (Version 3). arXiv. https://doi.org/10.48550/ARXIV.2303.01325

Cotton, D. R. E., Cotton, P. A., & Shipway, J. R. (2024). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International, 61*(2), 228–239. https://doi.org/10.1080/14703297.2023.2190148

Corea, F. (2019). Applied Artificial Intelligence: Where AI Can Be Used In Business. Springer International Publishing. https://doi.org/10.1007/978-3-319-77252-3

Curzon, J., Kosa, T. A., Akalu, R., & El-Khatib, K. (2021). Privacy and Artificial Intelligence. *IEEE Transactions on Artificial Intelligence, 2*(2), 96–108. https://doi.org/10.1109/TAI.2021.3088084

Dečman, M. (2015). Modeling the acceptance of e-learning in mandatory environments of higher education: The influence of previous education and gender. *Computers in Human Behavior, 49*, 272–281. https://doi.org/10.1016/j.chb.2015.03.022

European Commission. Joint Research Centre. (2020). AI Watch, historical evolution of artificial intelligence: Analysis of the three main paradigm shifts in AI. Publications Office. https://data.europa.eu/doi/10.2760/801580

Fernández Herrero, J., Gómez Donoso, F., & Roig Vila, R. (2023). The first steps for adapting an artificial intelligence emotion expression recognition software for emotional management in the educational context. *British Journal of Educational Technology, 54*(6), 1939–1963. https://doi.org/10.1111/bjet.13326

Gao, P., Li, J., & Liu, S. (2021). An Introduction to Key Technology in Artificial Intelligence and big Data Driven e-Learning and e-Education. *Mobile Networks and Applications, 26*(5), 2123–2126. https://doi.org/10.1007/s11036-021-01777-7

González-Calatayud, V., Prendes-Espinosa, P., & Roig-Vila, R. (2021). Artificial Intelligence for Student Assessment: A Systematic Review. *Applied Sciences, 11*(12), 5467. https://doi.org/10.3390/app11125467

Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep learning. The MIT Press.

Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial Intelligence for Assessment and Feedback to Enhance Student Success in Higher Education. Mathematical Problems in Engineering, 2022, 1–19. https://doi.org/10.1155/2022/5215722

Huang, A. Y. Q., Lu, O. H. T., & Yang, S. J. H. (2023). Effects of artificial Intelligence–Enabled personalized recommendations on learners' learning engagement, motivation, and outcomes in a flipped classroom. Computers & Education, 194, 104684. https://doi.org/10.1016/j.compedu.2022.104684

Ingavelez-Guerra, P., Robles-Bykbaev, V. E., Perez-Munoz, A., Hilera-Gonzalez, J., & Oton-Tortosa, S. (2022). Automatic Adaptation of Open Educational Resources: An Approach From a Multilevel Methodology Based on Students' Preferences, Educational Special Needs, Artificial Intelligence and Accessibility Metadata. IEEE Access, 10, 9703–9716. https://doi.org/10.1109/ACCESS.2021.3139537

Jain, G. P., Gurupur, V. P., Schroeder, J. L., & Faulkenberry, E. D. (2014). Artificial Intelligence-Based Student Learning Evaluation: A Concept Map-Based Approach for Analyzing a Student's Understanding of a Topic. *IEEE Transactions on Learning Technologies, 7*(3), 267–279. https://doi.org/10.1109/TLT.2014.2330297

Jones, K. M. L. (2019). Learning analytics and higher education: A proposed model for establishing informed consent mechanisms to promote student privacy and autonomy. *International Journal of Educational Technology in Higher Education, 16*(1), 24. https://doi.org/10.1186/s41239-019-0155-0

Jurs, P., Kulberga, I., Zupa, U., Titrek, O., & Špehte, E. (2023). Efficient Management of School and Teachers' Professional Development – challenges and Development Perspectives. *Pegem Journal of Education and Instruction, Vol. 13,* No. 2, 2023, 112-118

Kuleto, V., Ilić, M., Dumangiu, M., Ranković, M., Martins, O. M. D., Păun, D., & Mihoreanu, L. (2021). Exploring Opportunities and Challenges of Artificial Intelligence and Machine Learning in Higher Education Institutions. *Sustainability, 13*(18), 10424. https://doi.org/10.3390/su131810424

Lameras, P., & Arnab, S. (2021). Power to the Teachers: An Exploratory Review on Artificial Intelligence in Education. *Information, 13*(1), 14. https://doi.org/10.3390/info13010014

Li, J., Xiao, W., & Zhang, C. (2023). Data security crisis in universities: Identification of key factors affecting data breach incidents. *Humanities and Social Sciences Communications, 10*(1), 270. https://doi.org/10.1057/s41599-023-01757-0

Linardatos, P., Papastefanopoulos, V., & Kotsiantis, S. (2020). Explainable AI: A Review of Machine Learning Interpretability Methods. Entropy, 23(1), 18. https://doi.org/10.3390/e23010018

Luan, H., Geczy, P., Lai, H., Gobert, J., Yang, S. J. H., Ogata, H., Baltes, J., Guerra, R., Li, P., & Tsai, C.-C. (2020). Challenges and Future Directions of Big Data and Artificial Intelligence in Education. *Frontiers in Psychology, 11*, 580820. https://doi.org/10.3389/fpsyg.2020.580820

Maghsudi, S., Lan, A., Xu, J., & Van Der Schaar, M. (2021). Personalized Education in the Artificial Intelligence Era: What to Expect Next. *IEEE Signal Processing Magazine, 38*(3), 37–50. https://doi.org/10.1109/MSP.2021.3055032

Mehigan, T. (2020). Towards Intelligent Education: Developments in Artificial Intelligence for Accessibility and Inclusion for all Students. 539–547. https://doi.org/10.21125/iceri.2020.0169

Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B.-P. T. (2023). Ethical principles for artificial intelligence in education. *Education and Information Technologies, 28*(4), 4221–4241. https://doi.org/10.1007/s10639-022-11316-w

Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. Computers and Education: Artificial Intelligence, 2, 100020. https://doi.org/10.1016/j.caeai.2021.100020

Ouyang, F., Zheng, L., & Jiao, P. (2022). Artificial intelligence in online higher education: A systematic review of empirical research from 2011 to 2020. *Education and Information Technologies, 27*(6), 7893–7925. https://doi.org/10.1007/s10639-022-10925-9

Owoc, M. L., Sawicka, A., & Weichbroth, P. (2021). Artificial Intelligence Technologies in Education: Benefits, Challenges and Strategies of Implementation. In M. L. Owoc & M. Pondel (Eds.), Artificial Intelligence for Knowledge Management (Vol. 599, pp. 37–58). Springer International Publishing. https://doi.org/10.1007/978-3-030-85001-2_4

Paiva, R., & Bittencourt, I. I. (2020). Helping Teachers Help Their Students: A Human-AI Hybrid Approach. In I. I. Bittencourt, M. Cukurova, K. Muldner, R. Luckin, & E. Millán (Eds.), Artificial Intelligence in Education (Vol. 12163, pp. 448–459). Springer International Publishing. https://doi.org/10.1007/978-3-030-52237-7_36

Panjwani-Charania, S. & Zhai, X., AI for Students with Learning Disabilities: A Systematic Review (October 30, 2023). Panjwani-Charani, S. & Zhai, X. (in press). AI for Students with Learning Disabilities: A Systematic Review. In X. Zhai & J. Krajcik (Eds.), Uses of Artificial Intelligence in STEM Education (pp. xx-xx). Oxford, UK: Oxford University Press. , Available at SSRN: https://ssrn.com/abstract=4617715

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.

Pratama, Muh. P., Sampelolo, R., & Lura, H. (2023). Revolutionizing Education: Harnessing the Power of Artificial Intelligence for Personalized Learning. *Klasikal: Journal of Education, Language Teaching and Science, 5*(2), 350–357. https://doi.org/10.52208/klasikal.v5i2.877

R. C. Sharma, P. Kawachi and A Bozkurt (2019). The landscape of artificial intelligence in open online and distance education: Promises and concerns. *Asian J. Distance Educ., vol. 14*, no. 2, pp. 1-2, 2019.

Russell, S. J., & Norvig, P. (2016). Artificial intelligence: a modern approach. Pearson.

Shao, Z., Yuan, S., & Wang, Y. (2020). Institutional Collaboration and Competition in Artificial Intelligence. IEEE Access, 8, 69734–69741. https://doi.org/10.1109/ACCESS.2020.2986383

Somasundaram, M., Junaid, K. A. M., & Mangadu, S. (2020). Artificial Intelligence (AI) Enabled Intelligent Quality Management System (IQMS) For Personalized Learning Path. Procedia Computer Science, 172, 438–442. https://doi.org/10.1016/j.procs.2020.05.096

Sweeney, S. (2023). Who wrote this? Essay mills and assessment – Considerations regarding contract cheating and AI in higher education. *The International Journal of Management Education, 21*(2), 100818. https://doi.org/10.1016/j.ijme.2023.100818

Swiecki, Z., Khosravi, H., Chen, G., Martinez-Maldonado, R., Lodge, J. M., Milligan, S., Selwyn, N., & Gašević, D. (2022). Assessment in the age of artificial intelligence. *Computers and Education: Artificial Intelligence, 3*, 100075. https://doi.org/10.1016/j.caeai.2022.100075

Tan, S. C., Lee, A. V. Y., & Lee, M. (2022). A systematic review of artificial intelligence techniques for collaborative learning over the past two decades. *Computers and Education: Artificial Intelligence, 3*, 100097. https://doi.org/10.1016/j.caeai.2022.100097

Villegas-Ch, W., Palacios-Pacheco, X., & Lujan-Mora, S. (2019). Artificial intelligence as a support technique for university learning. 2019 IEEE World Conference on Engineering Education (EDUNINE), 1–6. https://doi.org/10.1109/EDUNINE.2019.8875833

Villegas-Ch, W., Arias-Navarrete, A., & Palacios-Pacheco, X. (2020). Proposal of an Architecture for the Integration of a Chatbot with Artificial Intelligence in a Smart Campus for the Improvement of Learning. Sustainability, 12(4), 1500. https://doi.org/10.3390/su12041500

Vo, N. N. Y., Vu, Q. T., Vu, N. H., Vu, T. A., Mach, B. D., & Xu, G. (2022). Domain-specific NLP system to support learning path and curriculum design at tech universities. *Computers and Education: Artificial Intelligence, 3*, 100042. https://doi.org/10.1016/j.caeai.2021.100042

Wu, J., Gan, W., Chen, Z., Wan, S., & Lin, H. (2023). AI-Generated Content (AIGC): A Survey (Version 1). arXiv. https://doi.org/10.48550/ARXIV.2304.06632

Yablonsky, S. A. (2020). AI-Driven Digital Platform Innovation. *Technology Innovation Management Review, 10*(10), 4–15. https://doi.org/10.22215/timreview/1392

Yu, H. (2023). Reflection on whether Chat GPT should be banned by academia from the perspective of education and teaching. *Frontiers in Psychology, 14,* 1181712. https://doi.org/10.3389/fpsyg.2023.1181712

Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., Liu, J.-B., Yuan, J., & Li, Y. (2021). A Review of Artificial Intelligence (AI) in Education from 2010 to 2020. Complexity, 2021, 1–18. https://doi.org/10.1155/2021/8812542