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ORIGINAL PAPER

The Integration of AI into the Lives of Engineering Students: A Case Study

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Abstract
In a world of technological innovations, the artificial intelligence (AI) has become more and more present in people's lives, be it for personal entertainment or for professional reasons. The educational system is part of this change as well, with both students and teachers relying on AI-platforms for various activities and tasks. The aim of the present paper is to analyse students' attitudes and expectations related to the use of AI in their personal and academic lives. The focus group consists of undergraduate students from the Faculty of Electrical Engineering, University of Craiova, Romania. The analysis is based on a survey among first and second-year undergraduates and is meant to assess how frequently students use AI-powered platforms, to what end, as well as the benefits and drawbacks of such platforms. At the same time, students are asked to offer their perspectives on the future of AI in the educational process. The results are of importance to both educators and decision-makers when it comes to reshaping the academic world.
Key words: *academic studies, artificial intelligence, AI- powered learning platforms, benefits, drawbacks*

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Introduction

Our world today is constantly shaped by technological innovations in diverse fields, such as medicine, engineering, agriculture or education and, in this rapidly-changing scene, artificial intelligence (AI) has emerged and changed the way people live, think, communicate or learn. Step by step, AI has become a visible helping tool in everyday life and the educational field is no exception to this tendency. Students nowadays use AI platforms for different reasons, be it to find further explanations to certain concepts, to summarize specific information, to translate languages, solve mathematical problems, or even for leisure time. Thus, AI-tools seem to become more indispensable for students since they do not only assist their academic pursuit but they also offer fun-time activities. The academic world has also been impacted by the advancements of AI platforms, with both students and educators using them to enhance the educational process.

Being incorporated into the broad field of STEM (Science, Technology, Engineering and Mathematics), the undergraduates of engineering, including electrical engineering ones, are already familiar with the use of advances in technology and human-machine collaboration in their tasks and research. Though students rely on generative artificial intelligence (GenAI) in their workflows, especially in research projects, there is the need of substantial qualitative research on their perceptions on how the technology will change their skills, as, according to Quince et al., "[…] students are not only current users of GenAI in educational settings, but also future professionals who will be expected to use GenAI-supported tools while maintaining technical judgement, accountability, safety, and ethical responsibility" (Quince, Chen, Lindors, 2026, 1-20). But, in order to become proficient in their future careers, it is of high importance to grasp an understanding of students' perceptions related to the use of AI tools, both personally and professionally. Therefore, the present study focuses on how familiar the students in the engineering field are with the use of AI-tools, how often they utilize such technology and specifically, how they perceive the integration of AI in education.

Literature review

AI-technologies and their impact on our lives have become the subject of numerous studies, especially since 2020 when people started relying more and more on technology advancements due to the lockdown period imposed by Coronavirus. Various surveys have centred on the attitudes and perceptions of academic students on the use of AI-tools, yet an area to be further analysed for broader data so that the innovative technology be employed in the educational setting at its highest potential. As a result of a survey conducted in India on how students feel about the use of AI-tools in their academic and research endeavours, Panduranga Swamy, Gnanasekaran and Jain (2024) conclude that such tools are primarily used for writing research papers, reviewing literature and detecting plagiarism, encountering, at the same time, certain difficulties in the level of productivity. In another research among Romanian students on the integration of artificial intelligence in the academic educational process, Pană-Micu infers that, "the use of artificial intelligence in education is perceived as a major opportunity to modernize and streamline the learning process, but it requires responsible implementation, adequate training of teachers, and clear regulation" (Pană-Micu, 2025: 382), similar findings with another survey performed among students majoring in Aerospace and Medical Engineering from the National University of Science and Technology Politehnica, Bucharest, Romania, where the authors conclude that, "AI has become a critical component of the modern academic landscape offering significant benefits such as

personalized learning, enhanced engagement, and improved access to educational resources", yet with challenges "regarding the accuracy of AI outputs, the risk of over-dependence and the potential erosion of critical thinking skills" (Vieriu, Petrea, 2025: 10). Another study carried out among Greek social sciences students on the cognitive, emotional and behavioural dimensions of AI attitudes confirms the existence of such indicators and the value of a multidimensional measurement of attitudes towards AI (Katsantonis & Katsantonis, 2024: 1-14). A study performed in Slovenia, on 422 participants, which included statistical analyses of responses, such as Analysis of Variance, finds that students recognize the efficiency of AI, with some concerns expressed on learning quality and academic integrity, therefore emphasizing the need of a responsible integration of AI in education. At the same time, the results of the study indicate various frequencies in using AI, depending on the field of study and academic level. It's been shown that, first and final-year undergraduates use AI tools more frequently than the other students, while, in the case of the field of study, the social and natural science students use such tools more often than those majoring in humanities. (Fošner, 2024).

In a study carried out among accounting students from a university in Peru on the determinants of attitude towards the use of AI, the results indicate that, "students have a positive attitude toward AI, which significantly influences their behavioral intention to use this technology. The perception of usefulness, the entertainment associated with the use of technological tools, and the availability of facilitating conditions in their academic environment mainly explain this favorable attitude" (Hernandez-Pajares, Jara-Sarrua, Chau-Miyakavoa, 2026: 17).

Apart from the academic world, where students turn to artificial intelligence platforms for various reasons, such as assignments, research, quick answers or personalized learning experiences, the area of entertainment and spending leisure time in a fun and interactive way is also present in their lives, some apps or virtual communication tools being also based on AI, which leads to the major role this technology plays in youngsters' everyday activities. In their studies, Bhutoria (2022), Dwivedi et al. (2023), Nakshine et al. (2022) or Chan and Hu (2023) draw attention not only on the benefits of such technology but also on the drawbacks it entails, such as isolation, anxiety, digital fatigue or the impossibility to maintain a healthy balance between their personal and academic lives.

On the other hand, the integration of artificial intelligence in education also depends on teachers' perceptions to the benefits and drawbacks of this technology. Teachers' attitudes impact students' use of technology for different tasks in their educational endeavor. As a result of a quantitative and qualitative study performed among 250 teachers in the primary, secondary and higher education institutions, Shakeel, Waheed & Inam (2026) conclude that, "although teachers are aware of the possible advantages of AI, such as personalized learning, effective assessment, and adaptive feedback, they also state that they have such issues as limited training, insufficient infrastructure, and fears related to deskilling" (Shakeel et al., 2026: 363).

Yet, to be able to integrate AI technology into the academic world properly, we need to further research the topic, to analyze the attitudes of both students and teachers on the efficiency of such platforms to be used, to take into consideration the drawbacks related to inaccuracy, safety, over-dependence which might lead to serious health problems as well as issues regarding the available infrastructure in universities. Therefore, there is the need of substantial research in the matter to meet the expectations of the future.

The Case Study

The purpose of the study

The purpose of the present study is to offer valuable insights into how AI-technologies are integrated in the academic world of students, taking into consideration factors such as the frequency of using the AI tools for various reasons in their education, the platforms they are familiar with, the reliance on AI for assignments, projects or homework, the benefits and limitations of AI in education, as well as students' opinions and expectations regarding the future implementation of AI in the educational process. It is meant to be of help in the broader attempt to research this new field, yet necessary to a successful and meaningful future education. It is to be stated that the answers of the focus group are only a mere part in the general picture, yet the results could be of guidance if included into the whole effort of potentially integrating AI-tools in the educational pursuit. It offers a view on the attitudes students in engineering have towards the use of AI in education and the prospect of it becoming essential in the future.

Participants

The focus group of the present study consists of a number of 160 students, first and second year undergraduates, majoring in Electrical and Power Engineering at the University of Craiova, Romania, precisely 72 students studying Electrical Engineering and Computer Sciences, 21 in Aviation Equipment and Installations, 25 majoring in Power Engineering, and 42 students in Electromechanics.

Concerning the age of the respondents, 114 students are between 18 and 22 years old (71.25%), 20 students (12.5%) are aged 23 to 27, while 26 students (16.25%) are older than 27. The majority of students are attending university for the first time while some, either follow a second academic specialization, or already work for local or national companies, and need an academic degree to promote in their careers.

The information was gathered as a result of an in-person survey, in the form of a questionnaire that the participants received during courses. The study was conducted during the academic year 2025-2026.

Description of the questionnaire

At the beginning, information on the age of the students, their academic year, as well as their specialization is gathered for a better identification of the target group. The body of the questionnaire consists of ten structured and unstructured questions which target how frequently students use AI applications for personal, general information and for educational purposes, their opinion on the usefulness of AI platforms in education, the degree of familiarity with various AI platforms, the end they use different platforms for, as well as how much they rely on such apps for assignments or projects. At the same time, the questionnaire targets their perspectives on the benefits and limitations of using AI in education. At the end of it, students are asked to offer their predictions on the future integration of AI in the academic world to such an extent that it becomes essential in the educational process.

The majority of questions are closed-ended, offering limited response options, including multiple-choice or rating scales questions to be able to gather valuable quantitative data in a clear and easy way to interpret. Such questions are of help in pinpointing how participants perceive the use of AI in education, the platforms which are

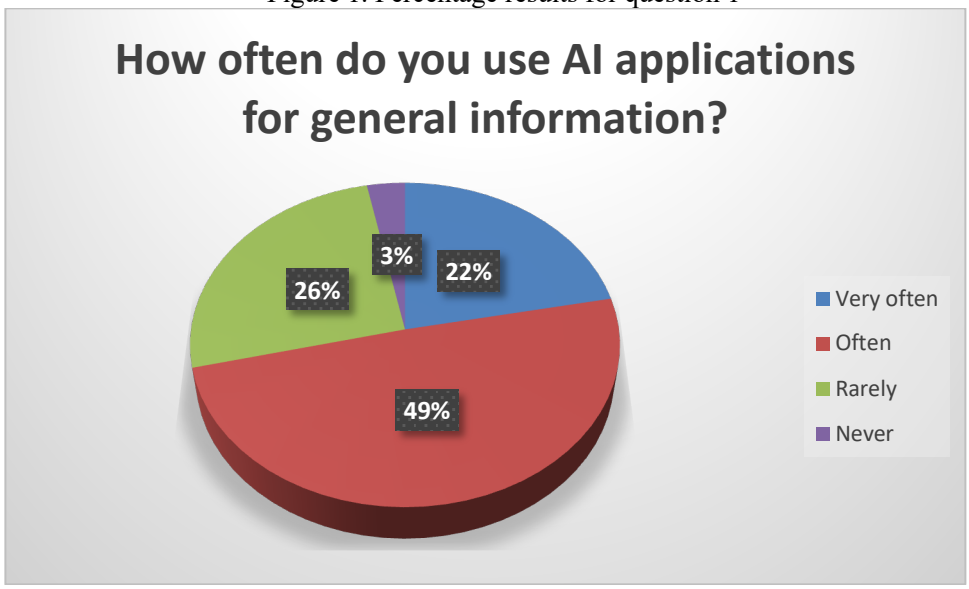
mostly used in this process, the positive and negative aspects they consider when using the AI technology.

The open-ended questions capture new ideas and insights which might not have been anticipated. They target the usefulness of AI platforms, to what purpose participants use various AI-platforms and how they see the future of AI in education. Such questions are of great help in understanding the attitudes of students towards the use of artificial intelligence in their educational development.

Presentation of main results

The first question aims at gathering data on the frequency of using AI applications for general information. It is important to grasp an idea of how often students rely on AI for daily purposes, whenever they need to find out the answer to a topic they are interested in or to seek advice on daily chores. Approximately 49.37% of respondents use AI apps to search for general information on an often basis, while a percentage of 25.62% use them on rare occasions and 21.87% very often rely on such applications. An interesting 3.13% states that they never seek help from the artificial intelligence apps. Thus, it is shown that the majority of respondents turn to AI for their general needs, a habit that is becoming more and more present in our lives.

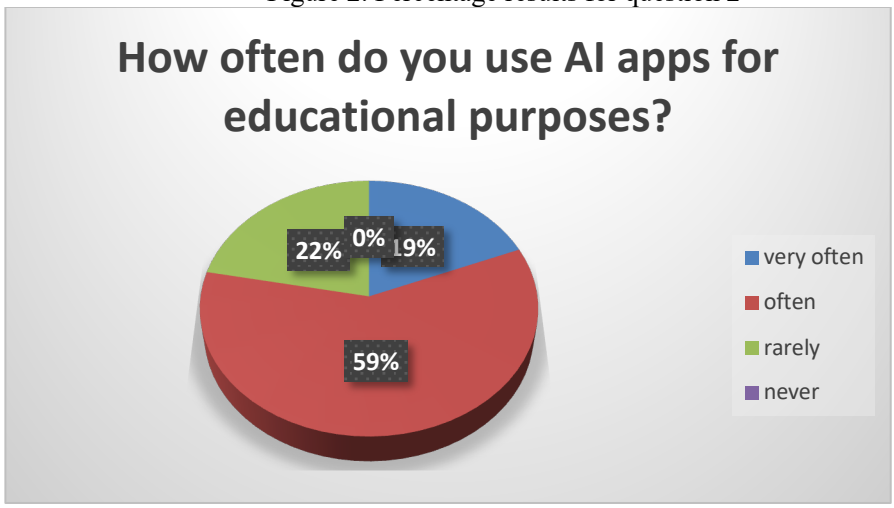
Figure 1. Percentage results for question 1



The second question refers to the transition of using AI apps from general use in respondents' daily lives to the more specific goals, in this case, the educational field. Various applications and platforms are utilized to explain more difficult concepts, correct work, organize information or provide help with math and physics equations. The frequency students use such applications is an indicator of how much they rely on them in the process of acquiring valuable information. As it is shown in Figure 2 below, most students use AI applications often (59.38%) and very often (18.75%), while only 21.87% of respondents use them rarely. Since no participant chose "never" as an option, we can easily deduct how present AI is in students' learning experience.

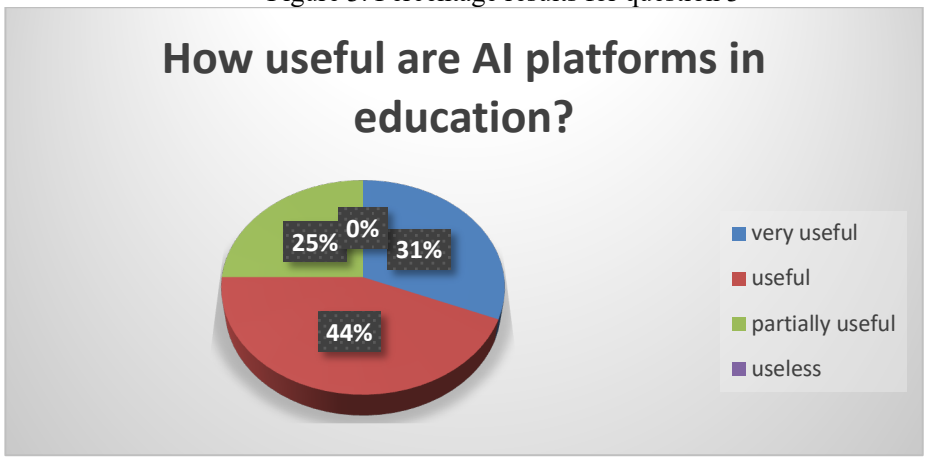
If we compare the two figures, it is easily understood that the overall percentage of using AI applications for educational purposes slightly increases than for general information. At the same time, if in the case of searching for general information, a low percentage responded that they never use AI apps, this situation is not encountered for the educational purposes. All respondents seem to resort to artificial intelligence to help them in their studies.

Figure 2. Percentage results for question 2



The next item in the questionnaire aims at finding out students' perceptions on the usefulness of AI platforms. According to their options, 43.75% find the platforms as being useful, followed by 31.25% who consider AI very useful, and a percentage of 25% who regard such platforms as being partially useful. No answers were registered for the useless option offered by the questionnaire.

Figure 3. Percentage results for question 3



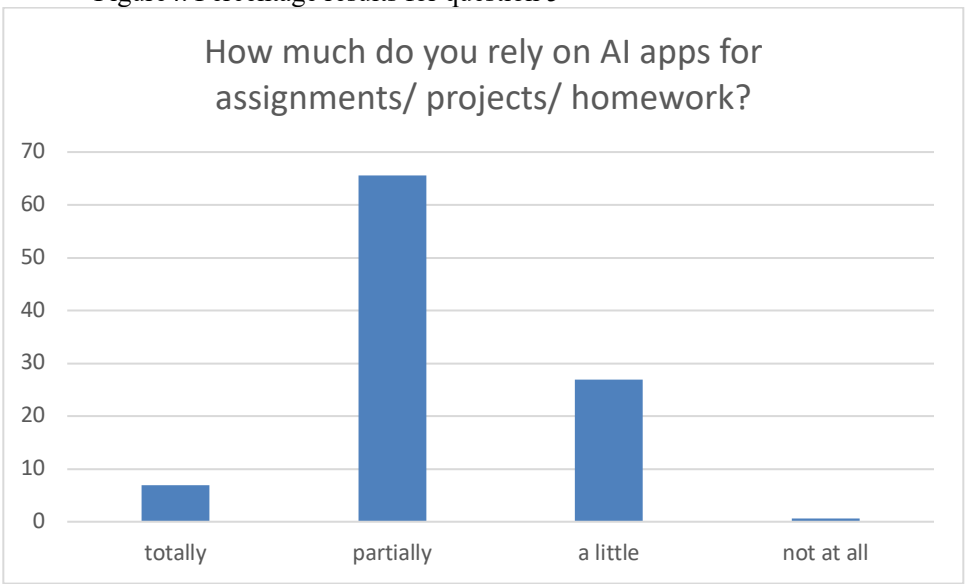
When being asked to offer reasons for their choices, the answers varied. Among those who consider the AI platforms as being both very useful and useful, the main reason expressed by the majority of students was that AI offers quick access to information and

its instant answers represent a great plus in saving time. Students prefer AI apps rather than browsing the internet or the traditional method of searching for specific information in textbooks. As one student motivates, *it's great to have knowledge at your fingertips.* Another reason mentioned by many is the fact that AI offers clear explanations in an easy way to be accessed, since *everyone has access to an expert that can break down complex topics and explain them at any level of difficulty,* or, as another student states, AI is capable *to compress large amounts of information into easier to understand chunks.* The self-directed learning benefit is also mentioned by some students, one of them saying that AI acts *like a private tutor*, while another considering that *if it's used correctly, it can become like a second teacher, available 24/7.*Other reasons mentioned by students are: instant feedback, autonomous practice, a great help with projects and assignments, the possibility to summarize long courses, even generate quizzes to test the acquired knowledge, as well as great assistance when students lack ideas and need help. On the other hand, some of the reasons mentioned by those students who find AI platforms partially useful, are: the lack of precision, incorrect answers at times, the hindering of critical thinking, or issues related to addiction and plagiarism. One student considers that *we should rely more on our thinking,* while another motivates his decision by stating that, *the usefulness of AI platforms is directly proportional to the person's knowledge in the domain he/she is studying.*

In terms of familiarity with various AI platforms (question 4), ChatGPT and Gemini come first in students' responses. Most students are very familiar with these two platforms, followed by Copilot, Claude AI, Grok and DeepSeek. A few of them expressed familiarity with platforms such as Notebook, Merlin, Meta AI, Perplexity and Jarvis. Such answers lead to the conclusion that students are aware of all the possibilities AI technology brings, switching platforms depending on their needs and preferences.

A topic of robust discussion among educators nowadays is the issue of plagiarism and lack of originality when it comes to the integration of AI tools in the educational process. Many teachers, at all levels, fear that the moment they give assignments or projects, students will not leave their mark on the topic, just ask AI tools to generate content for them, without synthetizing the received information, just copying the result and handing it to them. Such a practice hinders the thinking and evolves into unhealthy and inappropriate habits. Thus, the following question aims at investigating students' degree of reliance on AI apps for assignments, projects or homework. As a result of their options, 6.87% of students rely on such apps totally, 65.63% use AI tools partially, 26.88% a little, while only 0.62% never count on these tools for their projects.

Figure4. Percentage results for question 5



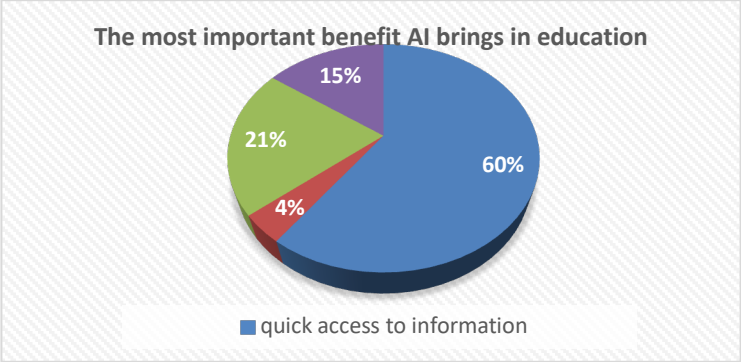
To better understand students' attitudes towards AI-tools, question number six addresses the topic of what the respondents use AI platforms for. Their habits in using specific platforms indicate the needs that AI meets for them. Students use various apps and switch them depending on their necessities. Their responses place ChatGPT and Gemini on the top of their preferences, being used regularly for different tasks. While ChatGPT is mainly used for general information and help with essays or homework, Gemini is preferred when it comes to academic research, complex math and physics equations or for diagrams in AutoCAD, graphs on Matlab, coding and debugging. Both AI platforms are used to generate images and edit photos. Students also prefer DeepSeek AI for maths and physics and Grok AI to send and generate pictures, for optimal game tips and solutions for a bug in operational systems.

The next question refers to the AI platforms used by students for foreign languages, be it to improve knowledge, learn a language for the first time, or deal with texts written in another language. The participants show familiarity with diverse chatbot platforms, Google Translate being their first preference when they need to translate a text, followed by Chat GPT. In order to practise foreign languages, students rely mainly on Duolinguo, while a few interested in improving their grammatical knowledge access Grammarly. Platforms such as Gemini and DeepL are also mentioned as being frequently used. At the same time, the respondents are not aware of what ELSA Speak tool involves.

The integration of AI in education comes with several benefits, overall enhancing the learning experience of students. As Bălănescu outlines, „ít is evident that the entire 21st century discourse on knowledge and competence is shaped by the advance of digitalisation and the myriad of learning opportunities that it offers" (Bălănescu, 2026: 8). According to the respondents (60%), the most important benefit AI brings is the quick access to information, the possibility to receive instant answers without having to search for too long to find the necessary data. 21% of students choose self-directed learning as the primary benefit of AI tools. The fact that AI platforms adjust difficulty levels so that they meet each student's learning needs, help them set goals and manage the learning

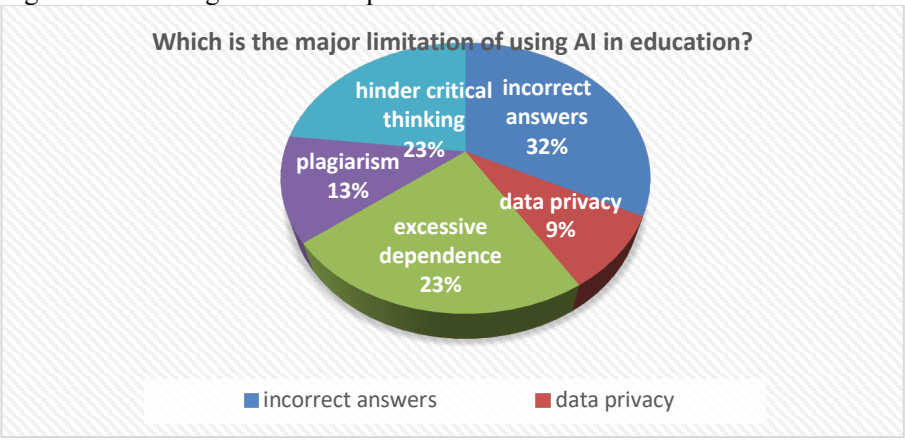
objectives, is relevant to students. Instant feedback is seen as important by 15% of students since, besides the advantage of providing a real-time response, it offers the possibility to improve on the spot. Autonomous practice, though a notable benefit that AI brings, is considered the most important by only 4% of respondents. It should be mentioned that all the options offered to students are major in discussing the benefits that AI brings in the educational setting, hence the difficulty in choosing only one option which students perceive as being 'the most important'.

Figure 5. Percentage results for question 8



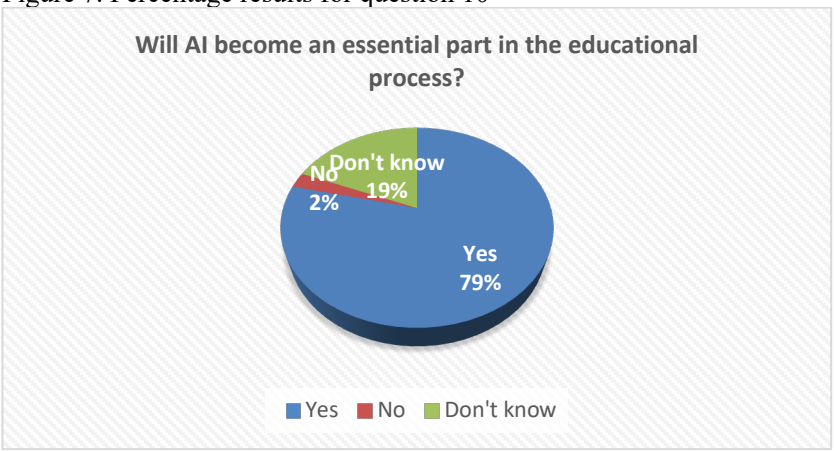
Though most people admit that AI technology improves our standard of living, giving a hand with advice and information when needed, saving precious time in search of relevant data, its use in education brings on several limitations and drawbacks. Respondents were asked to choose from several drawbacks the AI limitation which they consider as being the most important. Thus, question nine focuses on some weaknesses that AI tools might bring in the educational endeavour. The answers are balanced, yet, most students perceive incorrect answers as the primary drawback of AI (32.5%), followed by excessive dependence on a par with the hindering of critical thinking (23.12% each), while plagiarism is taken into consideration by 12.5% of the respondents. Data privacy is considered a major drawback by 8.76% of the students surveyed.

Figure 6. Percentage results for question 9



As for what future reserves and whether AI technology will become an essential part in education (question 10), the majority of responses are directed towards a positive answer. A number of 126 students (78.75%) consider that AI will be essential in the future educational systems, motivating their choice on various reasons. Most of them consider that, since it is used in several classes and projects, it has already become essential, while others are positive that, with the evolution of society as a whole, AI-tools will become better and better, therefore being more and more integrated into the educational process. Some participants perceive AI-platforms as a great support for both students and teachers and, due to the completion of various tasks, such as interactive videos, creation of flashcards, AI not only functions as a tutor but it has the potential to replace teachers in a few years. 18.75% of respondents are unsure of the possibility for AI to become essential in education. They motivate their choice based on several reasons: *it will never replace teachers; it has disadvantages especially for early-stage learners; only if it is improved and functions under clear legislation, it can turn out to be a really useful tool.* A low number of students (2.5%) consider that AI will never be essential in the education of the future. The reasons offered state that AI is unable to fulfil the tasks of teachers while the traditional ways of studying, such as specialised textbooks or reading books, are more valuable in developing the ability of acquiring knowledge. One student considers that, *the living experiences cannot ever be replicated by AI.*

Figure 7. Percentage results for question 10



Conclusions

Based on the results of the present survey, several conclusions may be drawn. The majority of students, irrespective of age, assume a favourable attitude related to the usefulness of integrating AI-tools in the educational process. The respondents use AI applications frequently, they are familiar to various platforms that they utilize and switch them depending on their needs. Chat GPT and Gemini come first in their preferences, the latter being chosen for more difficult concepts and theories. More specific to their field of study, respondents resort to AI-platforms such as Claude and Deep Seek for math equations, complex projects, programming and coding. At the same time, according to their answers, it is clear that the majority depends on the help of AI-tools for assignments

or homework, the percentage of those who try to fulfil such tasks only by themselves being extremely low.

AI offers many benefits in education by providing autonomous practice, instant feedback or self-directed learning. Yet, students perceive the quick access to information as being the most important benefit of all, saving them time and acting as a virtual assistant available whenever they need help. Yet, challenges related to excessive dependence, plagiarism, the hindering of critical thinking or data privacy should not be overlooked. Among several limitations that AI technology brings on, students find the risk of inaccurate information as being a major drawback.

Overall, the vast majority of respondents consider that AI technology will be essential in the future educational process, with only a few expressing concerns on the replacement of individual thinking. Therefore, substantial research is highly needed so that the entire educational system to really benefit from what AI has to offer. Careful planning, training for both students and teachers, the establishment of clear rules on the use of AI tools are just some prerequisites to ensure an educational approach that maximizes AI benefits while it minimizes its risks.

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Appendix

Questionnaire
The Integration of AI into the Lives of Engineering Students

Academic year: Field of study:
Age:

1. How often do you use AI applications for general information?
   Very often Rarely
   Often Never
2. How often do you use AI apps for educational purposes?

   Very often Rarely
   Often Never

3. In your opinion, how useful are AI platforms in education?
   Very useful Partially useful
   Useful Useless

   Why?
   ……
   ……
   ……
   ……
   ……
   ……

4. Which of the following platforms are you familiar with? (Number from 1 to 5; from 1 – most familiar to 5 – unfamiliar)

ChatGPT	Microsoft Copilot
Google Gemini	NotebookLM
Jarvis	*Another/other:*

5. How much do you rely on AI apps for assignments/ projects/ homework?

Totally A little
Partially Not at all

6. Give examples of AI platforms you mostly use and for what needs (e.g.: general information; research; explanation of academic theories; edit academic essays; solve math & physics equations, etc.).

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7. When it comes to foreign languages, which of the following platforms have you used? (from 1 most frequently to 5 least frequently).

Google Translate		ELSA Speak	
Duolinguo		ChatGPT	
Grammarly		Another:	

8. Which is, in your opinion, the most important benefit of using AI in education?

Quick access to information	Self-directed learning
Autonomous practice	Instant feedback
Other:	

9. Which is the major limitation of using AI in education?

Incorrect answers	Plagiarism
Data privacy	Hinder critical thinking
Excessive dependence	Other:

10. Will AI become an essential part in the educational process?
Yes

No
Don't know

Reason for your choice:

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