

## THE USE OF ARTIFICIAL INTELLIGENCE IN EDUCATION BY STUDENT

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**Purpose:** The purpose of the study is to identify areas of student use of Artificial Intelligence (AI) in education, as well as to develop a model view of student use of AI in education.

**Design/methodology/approach:** The study used an integrated research approach, combining descriptive, comparative and descriptive analysis methods to provide an in-depth and multifaceted understanding of the role and potential of artificial intelligence in education. The research process started with a biblio-metric analysis and a systematic literature review, which was conducted in Scopus and Google Scholar databases. The literature analysis carried out allowed artificial intelligence to be defined, as well as selected AI tools to be identified. Subsequently, an in-house study was carried out, which was in the form of a survey - a diagnostic poll; authors' questionnaire containing ten closed questions was used as a research tool. The questionnaire was uploaded to Google and the link was distributed to selected students of Cracow University of Economics in Krakow. Responses were collected using the CAWI technique. A total of 295 responses were obtained.

**Results:** It was found that students use AI in education, the main areas of use of AI tools by students are: writing term papers, reports, or creating presentations. What is very important, students use AI to obtain feedback on their work, and are also aware of the benefits and threats generated by modern technologies. The conducted research allowed for the development of a model approach to the use of AI in education by students.

**Research limitations/implications:** The study was limited by the sample of people studying at Cracow University of Economics in Krakow. The authors showed that students use AI in education to a large extent, ChatGPT was most frequently indicated as the tool of preference, as well as the frequent use of Gemini by students. Students indicated risks as well as benefits of using AI in education which allowed the authors to conclude that they use AI consciously. Future research should include a more in-depth exploration of the directions of AI use in education and investigate the impact of AI on competence development. Research on the attitudes - behavioural, cognitive, emotional - of students towards ChatGPT may also be interesting, as well as examining the differences in attitudes depending on the field of study.

**Practical implications:** The development of a model for the use of artificial intelligence in education by students can indicate current trends in education that are posed to both lecturers and students to adapt to changing market and educational conditions.

**Social implications:** There is an increased awareness among lecturers and students regarding the use of AI in education and its impact on the sector.

**Originality/value:** Discussion of AI, identification of AI tools, identification of the extent and areas of student use of AI in education. The added value is to identify the benefits and risks of student use of AI in education, as well as to develop a model view of student use of AI in education.

**Keywords:** artificial intelligence, AI in education, AI in student education, student education, benefits of using AI, threats from the use of AI.

**Category of work:** academic paper, own research (diagnostic survey).

## 1. Introduction

Artificial intelligence (AI) is one of the most important trends shaping modern reality, and education is one of the areas where it plays a key role. AI can make the learning process easier, more efficient and more effective at all levels, for the student, the teacher and the education system as a whole. Learners assimilate knowledge and skills faster and with less effort, and can do so at a time and place that is convenient for them. However, it is important to remember that the integration of artificial intelligence into the educational process also raises numerous concerns. In this new set-up, the natural interpersonal relationships that play an important role in the education and socialisation process are reduced or even absent. Teachers do not want to be reduced to the role of technological guardians. AI is a powerful educational tool that has the potential to radically change the way in which we teach and learn. In the era where technology is rapidly changing, it is crucial that education does not lag behind, but evolves with it.

The traditional role of education is to prepare learners for the future. This future, in turn, appears today as a constant change in learning and working environments, which are increasingly filled with technology aiming to replace routine work with automated procedures and devices (Sysło, 2022). The phenomenon of artificial intelligence takes on particular relevance in the context of contemporary educational challenges, such as adapting to the diverse needs of students, the effective transfer of knowledge and the continuous improvement of teaching methods. In the light of these challenges, artificial intelligence becomes not only a tool to facilitate the learning process, but also a dynamic partner, capable of adapting to the individual's predispositions of students (Zalewska-Bochenko, 2024).

For the reasons mentioned above, technological advances as well as the use of AI in education by pupils, or students, will not be avoided. Instead, it is important to find out the scope, of the tools and extent to which students use AI in education, as well as to explore their awareness of the benefits and the risks of using AI.

## 2. Artificial intelligence, definitional scope

AI is a new, important and relatively unexplored area, and many AI applications have limited or no use due to ethical concerns and lack of trust from their users (Miller, 2019) demonstrates the ability to analyse vast amounts of data, which supports the creation of predictions, discovering patterns and generating insights in various design activities (Han, Childs, Luo, 2024).

AI is set to be one of the most important technologies of the future. The Committee of the Council of Ministers for Digitalisation adopted the 'Policy for the development of artificial intelligence in Poland' in 2020. The document sets out activities and goals for Poland in the short term (until 2023), medium term (until 2027) and long term (after 2027). Among the six areas, the document mentions education: "AI and education, actions taken from primary education up to the university level and course programmes for people at risk of losing their jobs due to the development of new technologies and educational grants" (Fazlagić, 2022).

A multitude of definitions of artificial intelligence can be found in the literature. Zalewska Bochenko (2024) points out that AI is a term that takes on different meanings depending on the context and perspective, and the definitions are as diverse as its applications. S. Koziej (2023) considers AI to be problem solving, decision making, data-driven learning, natural language understanding, image and sound processing, and many other tasks that were previously reserved for the human mind. On the other hand, T. Zalewski (2020) understands artificial intelligence as a system that allows us to perform tasks that require a learning process whilst taking into account new circumstances in the course of solving a given problem, which can, depending on its configuration, act autonomously and interact with the environment to varying degrees. M. Warszycki (2019) points out that AI is an area of science that brings together disciplines, methods, tools and techniques aimed at creating and developing a complete computer programme that will accurately reflect a model of how humans and their minds function. The main processes and functions it should perform are: inference and pattern finding, reasoning, learning from experience, using acquired information, non-accidental and non-random planning of activities, creativity, problem solving and autonomy in decision-making.

Today, artificial intelligence can be found in everything from smartphone cameras to video games, e-commerce, education, healthcare, cybersecurity, product recommendations, search engines or advertising (Fintech article 2022). The scope of the use of AI is broad, with researchers highlighting the use of AI in design, particularly for various design activities. This includes supporting idea's and concept generation (Luo et al., 2018; Sarica et al., 2021; Hanifi et al., 2022), concept and product evaluation (Chen et al., 2021), design simulation (Uddin et al., 2019), data analysis (López et al., 2019) and design automation (Kang et al., 2023).

Recently, large language-based artificial intelligence models such as OpenAI's GPT-3 and GPT-4, Google's Gemini and Meta's LLaMA, which have extensive common knowledge and powerful semantic reasoning capabilities, have been used to support design (Han, Childs, Luo, 2024).

AI is also transforming the world of education, opening up new possibilities for teaching and learning. Thanks to AI, education is becoming more personalised, adapting to each student's individual needs and learning styles.

Alongside advances in AI technologies, with human abilities such as learning, adaptation, self-correction and complex problem solving (Chen et al., 2023), the application of AI in education has attracted increasing attention due to its potential to transform educational practices in both classroom settings and distributed learning contexts (Wu, Wang, Wang, 2024; Gao, Wang, Wang 2024; Huang, Wang, Zhang, 2024; Wang, Reynolds, 2024). For example, Wu, Wang and Wang's (2024) study of factors that influenced students' intention to reuse AI highlighted the potential of AI to remotely support language learning. Huang, Wang and Zhang (2024) linked the generative acceptance of AI to students' digital learning wellbeing and self-efficacy. The popularity of AI in education has revealed research on innovations in teaching and learning that take into account the status of individuals and the need to deepen their engagement (Zhou, Hou, 2024).

AI-based tools enable more effective and interactive learning experiences, facilitate access to knowledge, but also support the development of critical thinking and creativity. The introduction of these innovative technologies is opening new horizons in the way we teach and learn in the 21st century. Suggestions for a selection of the most useful AI tools created with Microsoft Bing for AOL.co.uk that offer's new learning methods and pathways for the authors as presented in Table 1.

**Table 1.**  
*Selected most useful AI tools*

| <b>AI Text Tools</b>          |                                                                                                                                                         |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| ChatGPT                       | A conversational AI App that can talk to users about a variety of topics and provide detailed answers based on a question.                              |
| Jasper AI                     | A natural text generation platform that can create high-quality content for a variety of fields and purposes, such as marketing, sales, education, etc. |
| WriteSonic                    | Tool for creating content, articles, landing pages.                                                                                                     |
| <b>AI Business Assistants</b> |                                                                                                                                                         |
| Grammarly                     | An online writing assistant that helps correct grammar, spelling, style and tone of text, as well as suggesting better words and phrases.               |
| Rewind AI                     | It remembers everything that was on your computer screen, your laptop or phone. You type in a keyword and it tells you where and when you saw it.       |
| Compose AI                    | A browser extension that allows you to write faster and better with intelligent context-based text suggestions.                                         |

Cont. table 1.

| <b>Graphic AI systems</b>           |                                                                                                                                           |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| MidJourney                          | Best for generating high-quality creative graphics.                                                                                       |
| Leonardo                            | A platform for creating and editing graphics using artificial intelligence to manipulate images, colours and styles.                      |
| Dall-E 3                            | A model for generating images from natural text that can produce unusual and creative visualisations of different concepts and scenarios. |
| Google AutoDraw                     | Artificial intelligence drawing tool that automatically enhances and completes user's sketches with professional icons and graphics.      |
| <b>Conversion of Speech to Text</b> |                                                                                                                                           |
| Otter AI                            | An AI-enabled meeting assistant that records audio, writes notes, automatically captures slides and generates summaries.                  |

Source: based on authors' research.

In addition to the tools listed in Table 1, it is also worth mentioning tools such as: Video AI editing (Runway, Papercup, Gling), AI music tools (Suno AI, Mumbert, Emergent Drums, Pop2piano), text-to-speech conversion (Eleven Labs, Veed IO, Murf), information extractors (Browse.ai, Import.io, Snorkel Flow), code correction (Kodezi, Replit, Copilot). The tools indicated above are far less frequently used in education than those shown in the table.

### 3. Materials and methods

The study uses an integrated research approach, combining descriptive, comparative and descriptive analysis methods to provide an in-depth and multifaceted understanding of the role and potential use of artificial intelligence in education.

The research process started with a biblio-metric analysis and a systematic literature review, which was conducted in Scopus and Google Scholar databases. Articles were filtered based on the purpose of the research. Articles were searched using the following keywords: artificial intelligence, AI in education, AI tools. The literature analysis was conducted from January 2025 to 15 March 2025. The literature analysis carried out allowed artificial intelligence to be defined, as well as selected AI tools to be identified. The analysis also identified a gap of knowledge, which is the lack of identified areas of student use of AI in education, as well as the lack of a model view of student use of AI in education.

Therefore, in the next stage of the research, a questionnaire was developed on the basis of the literature review carried out to identify the areas detrimental to the students' use of AI in education. Respondents answered the questionnaire using a five-point Likert scale. Using the Likert scale (1932) allows researchers to detect even relatively subtle differences in the attitudes under study. The advantage of this scale over simple scales is also evident in the fact that the individual items on the scale are not able to significantly influence the final outcome of the measurement. The items are supposed to balance each other, given the scale being constructed, whereas the particular properties of a simple scale can have a major impact on the conclusions drawn from the research. In rank methods, the normalisation procedure involves ranking the

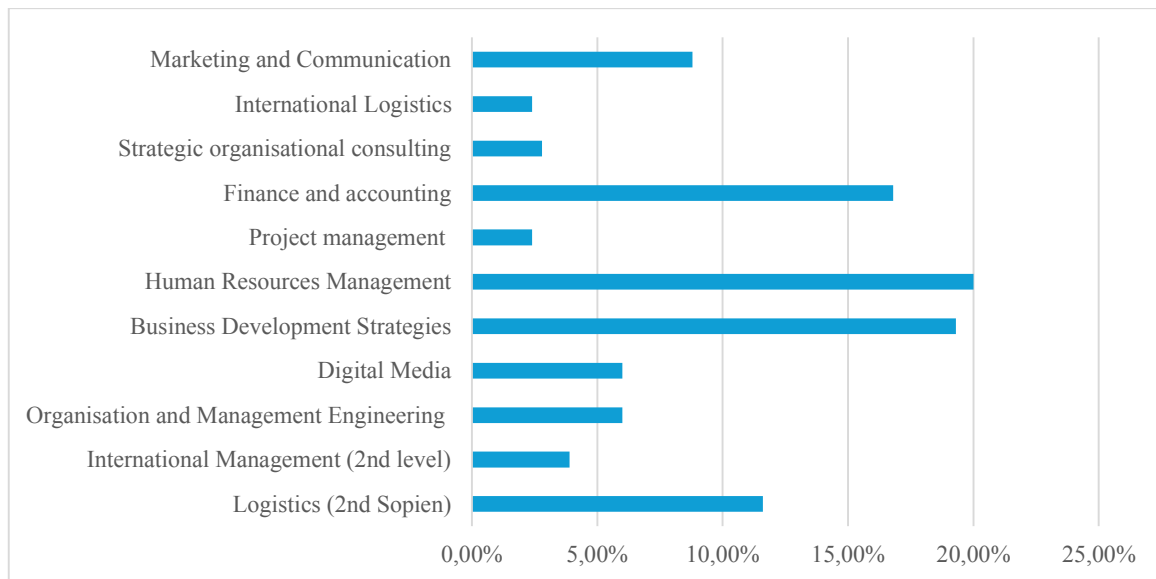
objects according to an ordering criteria adopted for the variable in question. Then, variants of the variable are assigned ranks, i.e. conventional numerical values, which are most often the ordinal numbers of the places occupied by the objects in the ordered series (Tarka, 2015). Accordingly, this study assumes that 1 means to a very low degree and 5 means to a very high degree.

To examine the relationship between variables, the Spearman rank correlation coefficient was calculated to check for linear and monotonic relationships. Additionally, the Mann-Whitney test was used for analysis.

The in-house research took the form of a survey, a diagnostic poll, and an original questionnaire containing ten closed questions was used as the research tool. In order to validate the questionnaire used for the study, a pilot study was conducted, in which the understanding of the questions contained in the questionnaire and the correctness of their content were asked. The questionnaire was uploaded to Google and the link was distributed to students at Cracow University of Economics in Krakow. Responses were collected using the CAWI technique. A total of 295 responses were obtained. The research was aimed at identifying areas of AI use in education by students, as well as developing a model view of AI use in education by students. The following research questions were formulated to realise the stated aim: do students use AI in education? which AI tools and to what extent do students use AI in education? In which areas do students use AI and to what extent? What benefits does the use of AI bring to students? What are the risks of using AI according to students? The research provided a comprehensive overview of current trends and research in the area of student use of AI in education, as well as an attempt to model the phenomenon in question. Furthermore, inductive reasoning was used in the analysis, which made it possible to generate general conclusions on the basis of detailed observations and analyses. This approach was crucial for formulating directions for further research and future directions for the development and impact of AI on education. Each of the methods used made a significant contribution to the comprehensive analysis of the issue, enabling an understanding of its various aspects.

#### **4. Results**

A total of 295 correctly completed questionnaires were obtained. The persons surveyed were representatives of various first and second degree courses. The structure of the persons surveyed by field of study is illustrated in Figure 1.



**Figure 1.** Structure of the surveyed students by a field of study.

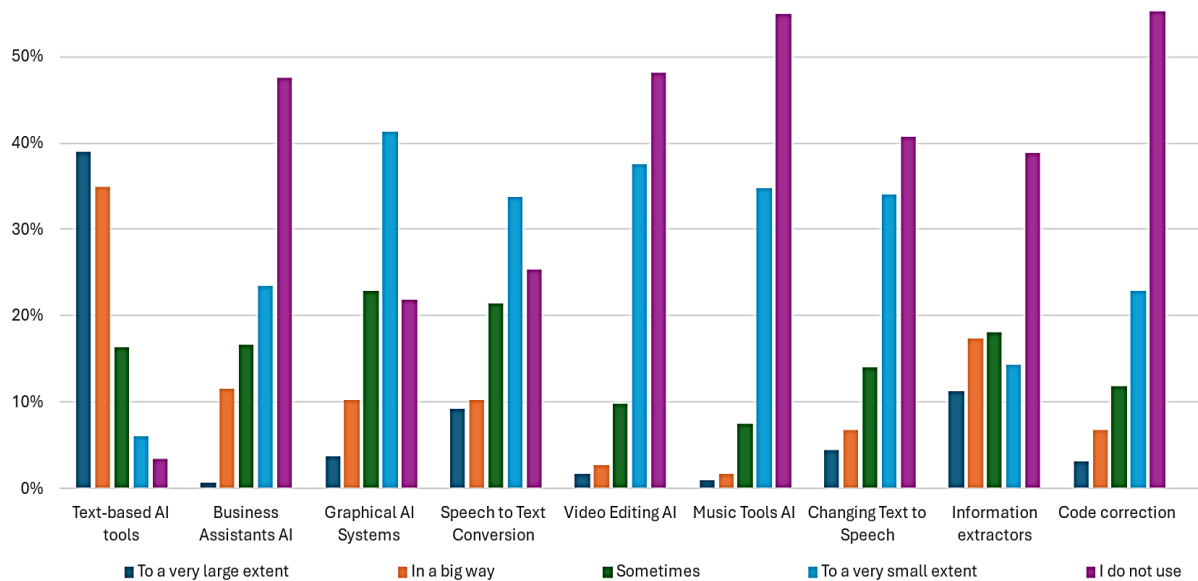
Source: own compilation based on conducted surveys.

When analysing the summary presented in Figure 1, it can be seen that the largest group of respondents were students of Human Resource Management (20% of respondents) and Business Development Strategies (19% of respondents), followed by Finance and Accounting (nearly 17% of respondents), Logistics (nearly 12% of respondents), Marketing and Communication (nearly 9% of respondents), Digital Media and Organisation and Management Engineering (6% of respondents each). Representatives of first degree programmes accounted for 84.5% of respondents, while second degree programmes accounted for 15.5% of respondents.

As the Spearman correlation coefficient did not show statistical significance between the answers of the representatives of the different fields of study in the responses obtained, the results of the study are summarised.

The first question concerned students' perceptions of artificial intelligence, with 85% of those surveyed indicating that AI was one of the most important technologies of the future (7.5% of those surveyed stated that it was not and 7.5% had no opinion). Another question in the questionnaire concerned the use of AI by students in education. The survey allows the authors to conclude that students are using AI in education, with 66.3% of the respondents answering yes (24.9% indicated that they are using it to a very great extent, 41.4% indicated that they are using it to a great extent). In addition, it was determined that AI is used by 25.3% students to a partial extent, to a small extent by 7.4% of respondents and only 1% - 3 persons indicated that they use AI for educational purposes to a small extent.

The next question asked in the questionnaire was about the AI tools that students use. The results are illustrated in Figure 2.



**Figure 2.** Structure of AI tools used by students.

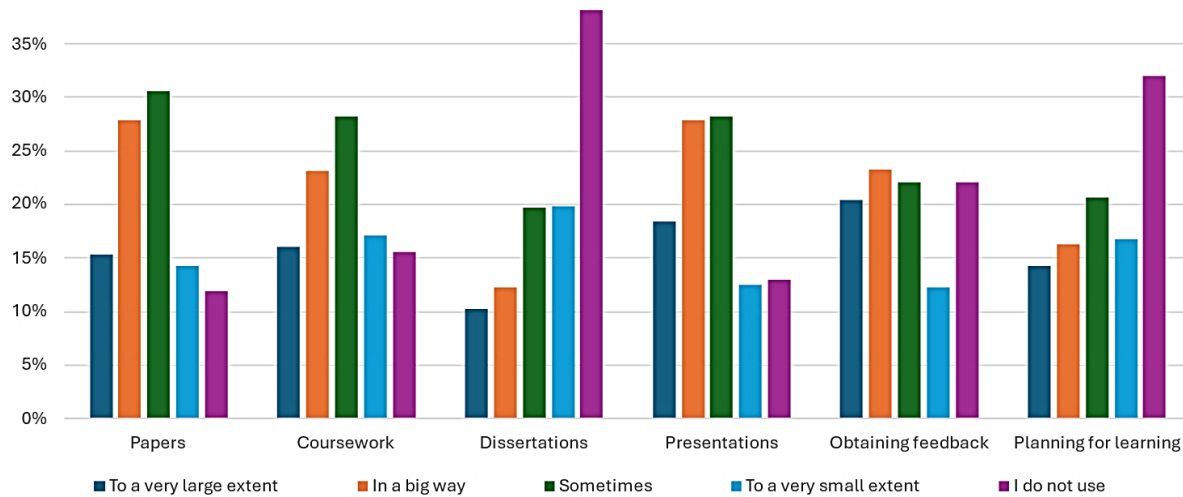
Source: own compilation based on surveys conducted.

When analysing the summary shown in Figure 2, it was found that students identified that they use text-based AI tools, with 74% of respondents answering that they use these tools to a very high or high degree. Graphical AI Systems and Speech to Text Conversion are tools used to a low degree so specified by more than 40% and 30% of the respondents, while unfamiliarity with these tools was indicated by only about 22%-25% of the respondents. Other AI tools such as Business Assistants AI, Video Editing AI, Music Tools AI, Changing Text to Speech about 40-50% of the respondents indicated that they use this tool to a very small extent or are not familiar with it at all. The AI tools least known by students were code correction and music tools so specified by more than 50% of respondents.

In the next question, students were asked to indicate which AI tools they use and to what extent. The research showed that students use ChatGPT in education to a very high degree, 114 students, 103 respondents indicated that they use ChatGPT to a high degree. This led to the conclusion that ChatGPT is used to a great extent in education by students, this was indicated by 75% of the people surveyed. Tools such as Jasper AI, WriteSonic, Rewind AI, Compose AI, Otter AI, MidJourney, Leonardo, Dall-E 3, Google AutoDraw are not known by the surveyed students, and between 83 to 90% of respondents indicated that they are not familiar with these tools. In addition to the tools indicated in the questionnaire, 75% of the surveyed students indicated that they do not use other AI tools in education, while about 10-15% of the surveyed students indicated that they use Perplexity and Gemini. Perplexity AI (Perplexity), is a US-based web search engine that uses a large language model to process queries and synthesise answers based on web search results (Roduner, 2023). Using a conversational approach, Perplexity allows users to ask follow-up questions and receive answers with links to sources from the web (Wiggers, 2023). Gemini, previously known as Bard, is an artificial

intelligence chatbot developed by Google. In 2022, OpenAI launched ChatGPT, and Google responded by launching Bard and its successor chatbot Gemini (Konrad, Cai, 2023).

In the next question, students identified in which areas and to what extent they use AI in education. The results are illustrated in Figure 3.



**Figure 3.** Areas of student use of AI in.

Source: own compilation based on surveys conducted.

When analysing the summary of results in Figure 3, it was found that the most common use of AI tools by the students surveyed is to create presentations, with 46.3% of the respondents responding in this way (18.4% of the respondents stated that they use AI to create presentations to a great extent, while 27.9% of the respondents stated that they use it to a lesser degree). Another area of students' use of AI tools in education is writing papers and getting feedback on their work, nearly 44% of respondents answered that they use AI in these areas to a very great and great extent. Students' use of AI tools for writing assignments is partial, the modal value and the most frequent value in this area is depicted in figure 3. Nearly 40% of the respondents indicated that they use AI for assignments to a very high or high degree, a similar percentage of about 33% of the respondents stated that they use AI tools for assignments to a very low degree or not at all. An interesting result was obtained in the area of students' use of AI tools for thesis writing (bachelor's, engineering, master's). The vast majority, 57.9%, of respondents declared that they use AI very little or not at all for thesis writing (38% indicated that they do not use AI for thesis writing). The modal value in this area is 1. Due to this result, it was hypothesised that second-degree students make greater use of AI tools for thesis writing. In order to verify this thesis, Spearman ranked correlations were calculated, which showed that there is no linear or monotonic relationship between these variables, regardless of whether someone is in a first or second degree, the level of use of AI is very similar. Test results: Correlation = -0.0072 p-value = 0.9043 In addition, an analysis with the Mann-Whitney test was performed and confirmed that: there is no statistically significant difference in the declared level of AI use between Level I and Level II students. Test results: Value of test statistic (W):

5038 p-value: 0.9049. Therefore, the thesis statement was rejected, as it was found that students do not use AI tools to the same extent in writing their theses at both first and second degree.

Another question included in the questionnaire concerned the verification of AI-generated material for content. 65% of the surveyed student's always check the generated material, 31% of the surveyed students do so sometimes, while only 4% of the surveyed students rarely and never check the AI-generated material. This allows us to conclude that students are consciously using AI tools and are also aware of the mistakes that the technology can make.

The questionnaire closed with questions on the benefits and risks of students using AI in education. The following scale was adopted: 5 - very high benefit/risk, 4 - high benefit/risk, 3 - partial benefit/risk, 2 - low benefit/risk, 1 - very low benefit/risk. The results in percentage terms are illustrated in Table 2.

**Table 2.**  
*Benefits and risks of using AI in education by students*

| BENEFITS OF AI                                                                       | Evaluation |      |      |      |      |
|--------------------------------------------------------------------------------------|------------|------|------|------|------|
|                                                                                      | 1          | 2    | 3    | 4    | 5    |
| Interactive tutoring (AI helps with understanding the material, answering questions) | 4,4        | 2,7  | 17,3 | 39,8 | 35,8 |
| Development of soft skills (e.g. management of emotions, problem solving)            | 18         | 22,4 | 27,5 | 20,4 | 11,6 |
| Language learning                                                                    | 5,4        | 11,2 | 25,9 | 30,6 | 26,9 |
| Searching for information                                                            | 2,4        | 1    | 10,5 | 29,9 | 56,1 |
| Assistance with tasks                                                                | 1,7        | 2,7  | 9,5  | 34   | 51   |
| <b>RISKS OF USING AI</b>                                                             |            |      |      |      |      |
| Lack of critical thinking                                                            | 1,4        | 2,7  | 16   | 33   | 46,6 |
| Lack of trust in AI                                                                  | 4,4        | 13,9 | 35   | 29,6 | 1,7  |
| Lack of social interaction                                                           | 5,5        | 13   | 23,5 | 27   | 31   |
| Addiction to technology                                                              | 3,4        | 3,4  | 11,6 | 28,9 | 52,7 |
| Lack of empathy and understanding                                                    | 7,1        | 16,3 | 25,5 | 23,8 | 27,2 |
| AI manipulation                                                                      | 3,4        | 9,5  | 19   | 30,6 | 37,4 |
| Ethical challenges and privacy risks                                                 | 3,4        | 8,8  | 20   | 31   | 36,7 |
| Disinformation generated by AI                                                       | 3,4        | 3,4  | 10,2 | 28,6 | 54,4 |

Source: own compilation based on surveys conducted.

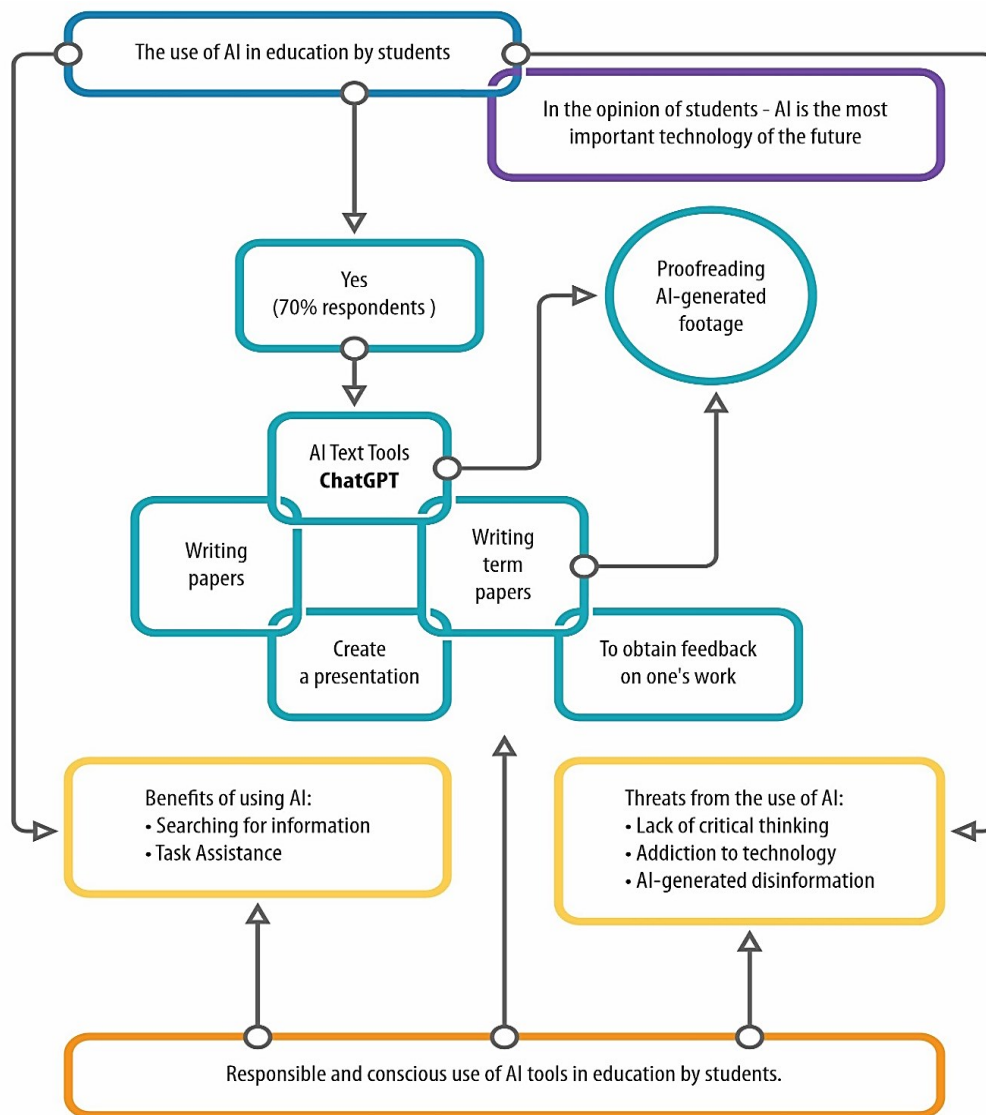
After analysing the summary presented in Table 2, it was found that the surveyed students were among as the biggest beneficiaries of using AI tools in education to identify information retrieval and assignment help, more than 50% of the surveyed people identified this as a very big benefit, while about 30% identified it as a big benefit. Among the benefits of using AI tools, students identified interactive tutoring (more than 75% of those surveyed) and language learning (more than 50% of those surveyed so indicated). According to the students surveyed, the biggest threats to the use of AI tools are the lack of critical thinking. Nearly 47% described AI as a very big threat for dependence on technology and misinformation generated by AI with a lack of social interaction, lack of empathy and understanding, manipulation by AI, and ethical challenges and threats to privacy are also threats, according to respondents.

## 5. Discussion

The research conducted has helped to confirm that studies indicating that AI is one of the most important technologies of the future (Makridakis, 2017). One area where AI is playing an increasingly important role is education. The implementation of AI-based technologies in the teaching and learning process opens up new horizons and brings both promising opportunities and serious risks (Saputra et al., 2023).

The research conducted did not confirm that students' use of a wide range of AI tools in education. The students surveyed indicated that they use text-based AI tools, of which ChatGPT plays a key role. Although AI technologies in education have the potential to transform traditional teaching models, adapting them to a variety of learning styles and paces, students use these tools cautiously. They recognise the potential of AI to individualise the learning process (Kowalczyk, 2023), but they also recognise the risks that flow from the use of AI tools. AI introduces many innovative solutions in education that have the potential to shape future generations. The benefits of their introduction are invaluable for adapting the educational process to the needs of each pupil (Zalewska-Bochenko, 2024), or student. AI offers the possibility to search for information, get help in solving tasks or get feedback on one's work, but it also carries risks. It is important to recognise the potential risks that may arise from, for example, over-reliance on AI. In the context of shaping future generations, it is crucial to find a balance between harnessing the benefits of AI and preserving the essential aspects of traditional education that shape social skills, empathy and critical thinking skills. Responsible and conscious implementation of AI technologies in the education system will have a decisive impact on the development and preparation of young people for future challenges (Zalewska-Bochenko, 2024). The research conducted allows us to conclude that students, despite their familiarity with AI, maintain this balance, use the tools, but are aware of the risks the technology brings.

The above considerations allowed us to develop a model approach to the use of AI in education by students, which is illustrated in Figure 4 below.



**Figure 4.** Model approach to the use of AI in education by students.

Source: own study based on conducted research.

The study of the degree of use of artificial intelligence in the educational process is becoming extremely important, as it has the potential to improve tools supporting students in achieving educational success. The use of artificial intelligence, such as speech recognition, spelling correction and automatic generation of suggestions, can provide additional support to students, helping them overcome difficulties whilst adapting the learning process to their individual needs (Więckiewicz-Modrzewska, 2024). Studies have shown that students use AI in education, these tools help them write term papers, reports or create presentations. It is very important that students use AI to obtain feedback on their work whilst being aware of the benefits and threats generated by modern technologies.

## 6. Conclusions

The areas where AI is being used in education by students has been identified, and a model approach to the use of AI in education by students has been developed.

In answer to the research questions posed, it should be stated that students use AI to a very large extent in education. The most common tool that they use is an AI text tool called ChatGPT. AI is most often used by students to write papers, term papers, create presentations, or obtain feedback on their work. Research has shown that students do not use AI to write theses. The potential benefits identified in the study from the use of AI include searching for information and assistance with tasks. Among the threats, students indicated, a lack of critical thinking, addiction to technology and disinformation generated by AI.

The study was limited by the sample of people studying at UEK in Krakow. Future research should include more in-depth analyses in the directions of use of AI in education and examining the impact of AI on the development of competences. Research on the attitudes including behavioral, cognitive and emotional effects on students towards ChatGPT may also be interesting, as well as examining the differences in attitudes in the field of study. Developing a model for the use of artificial intelligence in education by students may indicate current trends in education, which challenged both lecturers and students to adapt to a changing market and educational conditions.

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