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ARTIFICIAL INTELLIGENCE IN STUDENT LIFE – OPPORTUNITIES AND THREATS

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Purpose: The aim of this article is to assess the role of artificial intelligence (AI) in the daily lives of students and to present the opportunities and threats it brings.
Design/methodology/approach: The study analysed the literature on the development of artificial intelligence and its use in education. Compilations and reports on AI were analysed. The study was conducted by means of a Google survey distributed to students at the Bydgoszcz University of Technology.
Findings: Artificial intelligence, while demonstrating human-like abilities such as learning, critical thinking and problem solving, but raises a variety of emotions. Currently, however, its role should focus on repetitive tasks, which would allow teachers to pay more attention to the individual needs of students. Unlike science disciplines such as mathematics, AI should focus primarily on supporting this aspect of education rather than replacing it.
Research limitations/implications: Future research may be related to the creation of mentoring programmes in the area studied.
Practical implications: The results of the study can be used as input for the design of training programmes in the study area.
Social implications: Artificial intelligence (AI) in higher education presents huge opportunities. It helps to personalise learning, access knowledge faster and automate tasks. However, it also brings risks, such as plagiarism, dependence on technology, and reduced critical thinking skills. Appropriate use of AI is key.
Originality/value This article is mainly addressed to education professionals who want to implement and correctly use artificial intelligence in the teaching process.
Keywords: Technology in Learning, Challenges of AI, Benefits of AI, Future of Learning.
Category of the paper: Research paper.

1. Introduction

The rapid development of technology is significantly impacting the modern world. One of the key developments in this field is artificial intelligence. These developments are leading to an exponential increase in the amount of information being processed. The increasing

amount of digital data and the greater capacity of storage media mean that electronic devices are acting as repositories for large collections of personal data. With the development of technology, cybercrime is also increasing.

The origins of artificial intelligence (AI) date back to the early 1950s (Różanowski, 2007), when Alan Turing, a British mathematician and computer scientist, published Computing Machinery and Intelligence. In it, he introduced the concept of the Turing test to assess the intelligence of machines. This test was based on a text-based interaction between a human and a computer, without the possibility of eye contact. A judge, interviewing a human and a computer, was to judge which of the interviewees was a machine. If the computer was able to convince the judge that it was a human, it was considered to have passed the test and showed a certain level of intelligence (Sempryk, 2023).

The concept of 'artificial intelligence' is difficult to define unambiguously, due to the lack of a precise definition of intelligence itself. There are many attempts to define it. Stern defined intelligence as the ability to adapt to new conditions and perform new tasks. According to Spearman, it means the ability to perceive relationships and dependencies, and Ferguson considered it to be the ability to learn. Intelligence encompasses the ability to process information at the level of abstraction, enabling a creative approach rather than a merely mechanical action. At the end of the 20th century, it was limited to intellectual abilities, but today it is seen as the ability to integrate emotional, motivational and interpersonal spheres (Łazarska, 2010).

The main objective of this article is to assess the role of artificial intelligence (AI) in students' daily lives by identifying its potential benefits and risks, based on the results of a survey. The article aims to show how students perceive AI. The survey conducted shows how students use AI in their studies, time organisation, creative work and personal life.

2. Artificial intelligence – opportunities and threats

The importance of artificial intelligence (AI, artificial intelligence) has been growing in recent years. Initially, the subject was mainly addressed in science fiction literature, but now there is increasing attention to the need for appropriate legislation. There are also opinions pointing to the possibility of using AI-based tools in relations between citizens in everyday life and in dealing with state authorities, including in court procedures (Załucki, 2021). Artificial intelligence is becoming a widely used tool.

Artificial intelligence (AI) is a broad term that refers to the ability of computer systems to perform tasks that require human intelligence. It includes areas such as evolutionary algorithms, heuristics, genetic algorithms, expert systems, artificial neural networks and fuzzy logic. One of its key areas is machine learning, which allows systems to learn and improve from data, without the need for explicit programming.

Machine learning is based on algorithms that iteratively analyse input data (training datasets) to make judgements, improve performance and predict unknown data. Different types of machine learning can be distinguished, including:

- Supervised learning: the system trains itself on a predefined dataset, which enables precise inference when analysing new data.
- Unsupervised learning: The system is presented with a set of data and then identifies patterns and relationships between them on its own.
- Reinforcement learning: The system learns by interacting with its environment in pursuit of a specific goal. The process is based on a trial-and-error method in which successes are rewarded by updating network parameters (Matulionyte, 2021).
- Deep learning: A specialised form of machine learning that uses complex neural networks with many hidden layers. The more complex the problem, the more layers the model contains (Hurwitz, Kirsch, 2018).

Each of these methods differs in the degree of supervision and human intervention in the learning process, adapting to different data analysis needs and challenges.

The increased interest in the subject of artificial intelligence (AI) in many research centres around the world has resulted in concrete solutions that are already finding widespread practical application. These include (Zestawienia, 2024):

- Technologies based on fuzzy logic, used to control processes in factories, especially when data is incomplete.
- Expert systems, i.e. advanced databases with artificial intelligence, allowing questions to be asked and answers to be obtained in natural language, successfully used in medicine and pharmacy.
- Machine translation of texts, e.g. the SYSTRANS system.
- Neural networks, used for approximation, interpolation, pattern recognition and classification, compression, prediction, control and association, among others.
- Data mining, supporting information analysis, knowledge extraction and practical conclusions.
- Optical recognition, including identification of people from facial images and automatic detection of objects in satellite images.
- Speech recognition, used in content identification, speaker and person recognition, commonly used in commercial applications.

- Handwriting recognition, used in masse to automatically sort letters or operate electronic notepads.
- Artificial creativity, including the generation of poetry, composition and interpretation of musical pieces, which can be difficult to distinguish from works created by humans.
- Economics, where AI is helping to assess creditworthiness, create customer profiles and plan marketing campaigns using data-driven automatic learning such as customers' credit histories.

These applications demonstrate the diversity and potential of artificial intelligence in many areas of life and the economy.

Artificial intelligence (AI) was launched to apply humans to the world, thought processes, planning, communication and perception. Its goal is to improve human intelligence and replace humans in situations where their cognitive capabilities are available in utility applications. In the context of the use of AI in education, a question arises: can we ask about the process of shaping intelligence? What could be the health consequences? Will citizenship in 60 years, in which there is an intelligent person who is in the notification about the operation of AI in the teaching system, will be important?

These issues also raise doubts as to whether a student who is ‘offloaded’ from the learning process by AI will actually benefit. Indeed, it may well be that AI's business philosophy, with its focus on optimisation and increasing efficiency, will be counterproductive in education. In business, AI facilitates company-customer interactions, but is a similar approach to the relationship between the learner and the education system appropriate? It may be that AI solutions designed for businesses will prove inadequate or even harmful if implemented in education without deeper reflection. What passes for optimisation in business does not necessarily translate into better results in teaching, especially in areas such as poetry or art - for example, learning more works in less time does not equate to deeper understanding or a genuine fascination with art (Fazlagić, 2022).

According to data compiled by Statista, the artificial intelligence market will reach a value of more than $184 billion in 2024, an increase of nearly 50 billion compared to the previous year. This momentum is forecast to continue, with the market expected to exceed $826 billion by 2030 (Zestawienia statystyczne, 2024).

The largest US companies from the healthcare and venture capital sectors are investing heavily in artificial intelligence-based technologies, such as medical diagnostics and remote patient monitoring. A key factor driving these investments is the aging U.S. population.

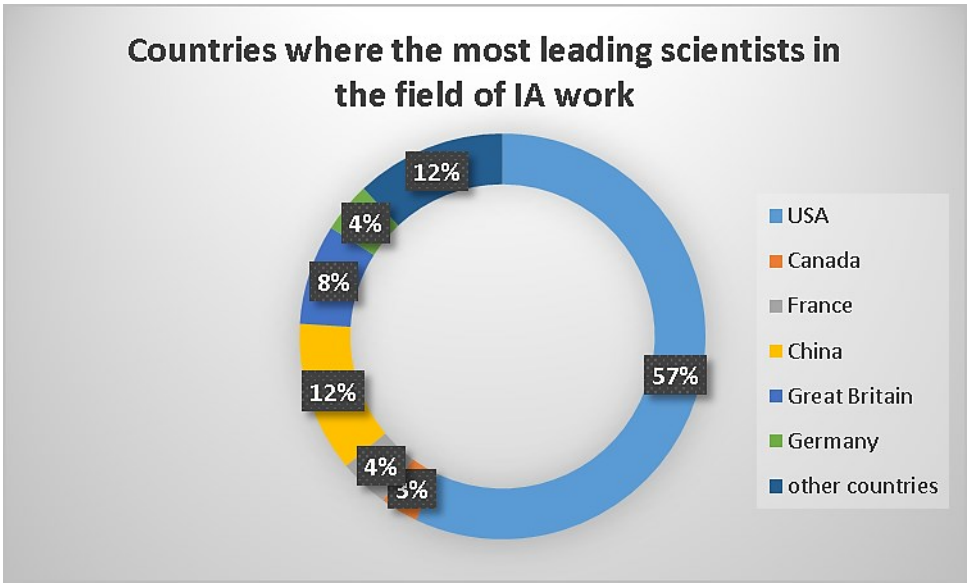

Figure 1. Employment on AI work in the world.

Source: Own work (Platforma projektowa, 2024).

The world's leading AI solutions providers operate in Silicon Valley - OpenAI, Google, Meta and Anthropic. They have developed dominant AI models such as GPT-4, DALL-E 3, Gemini, Llama 2 and Claude 3, and this is where most leading scientists work on artificial intelligence issues (Figure 1). Additionally, American universities such as Stanford, MIT and Carnegie Mellon dominate Macro Polo's ranking of the 25 best AI institutions in the world.

Reports from Stanford University indicate that AI could contribute to US GDP growth of 0.5-1.5% per year in the coming decade, which translates into an additional USD 1.2-3.8 trillion.

Top AI companies in the US:

- Google DeepMind – leader in AI research, creator of AlphaGo and AlphaFold.
- Microsoft – developing Azure AI and cooperating with OpenAI.
- IBM Watson – pioneer of AI for enterprises.
- Amazon Web Services – provider of advanced AI solutions in the cloud.
- OpenAI – creator of the GPT-3 and GPT-4 models (Zestawienia statystyczne, 2024).

In 2020, the Committee of the Council of Ministers for Digitalisation (CRMC) adopted the document 'Policy for the development of artificial intelligence in Poland', which sets goals and actions for the country in the short, medium and long term (Serwis Rzeczypospolitej Polskiej, 2024). One of the six areas identified in the document is education, covering activities from the primary level to higher education, courses for people at risk of losing their jobs due to new technologies and educational grants. In particular, the importance of education as a tool to develop human capital for the economy is emphasised.

The government plans to spend an amount in the order of one billion PLN on Polish artificial intelligence in 2025. Poland is planning to build the PLLuM (Polish Large Language Model), which is expected to strengthen the country's position in the global technological race related

to artificial intelligence. The head of the Ministry of Digitalisation assures that work on this project has already begun and will continue in the first months of 2025.

Rada Funduszu Sztucznej Inteligencji będzie skupiać kluczowe instytucje odpowiedzialne za alokację publicznych środków na rozwój sztucznej inteligencji w Polsce. W jej skład wejdą m.in. Ministerstwo Cyfryzacji, Ministerstwo Nauki, Ministerstwo Obrony Narodowej, Polski Fundusz Rozwoju, Narodowe Centrum Badań i Rozwoju, Narodowe Centrum Nauki oraz Bank Gospodarstwa Krajowego. Rada, pełniąc funkcję doradczą, skoncentruje się na wspieraniu rozwoju i wdrażania rozwiązań opartych na sztucznej inteligencji w kraju (Wiadomości z biznesu, 2024).

In 2024, pupils and especially students are increasingly using applications based on artificial intelligence to support them in learning, organising their time and developing their skills. The most popular are ChatGPT and other text generation tools that help with essay writing, solving assignments or learning languages. Grammarly, with its AI-based features, supports writing correct texts, and apps such as Notion AI help with note management and task planning. Engineering and science students are keen to use tools such as Wolfram Alpha or Mathematica to solve mathematical problems and analyse data. For digital creatives, on the other hand, image-generating applications such as DALL-E and Canva AI, which automate creative processes, are gaining huge popularity. These tools have become an integral part of everyday work and learning, facilitating knowledge acquisition and complex projects models (Zestawienia statystyczne, 2024).

Before we start talking about the real threats associated with artificial intelligence, we should consider when it will be possible to create truly intelligent machines. Visions of future robots that behave like humans and communicate naturally often come from science fiction literature and films. Despite numerous research on humanoid robots, it seems that in the future intelligent machines will not resemble humans in appearance or operation.

Machines should use senses adapted to their functions and environment, which is different from humans. Machine intelligence should be about creating models of the world, gaining knowledge through observation, and learning from guidance from teachers (Różanowski, 2007).

Artificial intelligence (AI) carries numerous threats that may affect various aspects of social and economic life. One of the main challenges is the possibility of using AI for disinformation, for example by creating realistic false content such as deepfakes, which can be used to manipulate public opinion. Moreover, the development of autonomous weapons systems poses a risk of escalating armed conflicts. Another significant problem is algorithmic bias - AI, based on historical data, may unknowingly reinforce existing inequalities and discrimination. From an economic perspective, AI-driven automation could lead to significant job losses in some sectors, which in turn increases the risk of economic inequality. Finally, the lack of appropriate regulations and control mechanisms over AI creates potential threats related to the privacy and security of personal data (Binns, 2018).

Artificial intelligence (AI) brings many benefits to education, but its use in student life also comes with significant risks. One of the biggest concerns is the potential for AI to be misused for unethical purposes, such as plagiarism or substituting self-generated content for work, which can reduce the level of independence and critical thinking among students. In addition, using AI tools inappropriately can lead to misinformation if algorithms generate erroneous or unverified information (Raport PARP, 2024).

Another challenge is the potential loss of interpersonal skills and the reduction of interpersonal relationships. Over-reliance on AI for learning can negatively impact the development of social skills, which are crucial in professional and personal life. Finally, there are privacy and data security concerns, as AI tools process vast amounts of students' personal and educational information, creating the risk of breaches and abuse (Portal edukacyjny, 2024).

3. AI in student life – research results

The aim of the research conducted was to identify students' opinions on the opportunities and threats associated with the development of artificial intelligence (AI). The study was carried out in early 2024. The survey was aimed at finding out the attitudes, knowledge and concerns of young people who will actively participate in the labour market and make decisions in the context of dynamically developing technologies in the future.

The survey was addressed to students of the Faculty of Management at the Bydgoszcz University of Technology and was conducted electronically using a Google Forms form. The questionnaire contained 10 questions. An invitation to participate was received by 250 students, of whom 210 chose to respond. The survey targeted all students who had already completed their first year of study. The high response rate (84%) demonstrates the interest in the topic and its importance to the survey participants.

The survey questions addressed both positive and negative aspects of AI, such as the impact on the labour market, education, ethical issues and respondents' personal feelings about their future career. The results of the survey aim to enrich the knowledge of students' perceptions of AI and to contribute to a better understanding of how young people perceive the development of this technology in a social, economic and educational context.

In response to the first question regarding knowledge of artificial intelligence, respondents overwhelmingly declared the state of knowledge of artificial intelligence as good, with as many as 60% of students choosing this answer. Such familiarity with the issue among the respondents made it possible to assume that the results of this survey would be meaningful. The distribution of the remaining responses is shown in Figure 2.

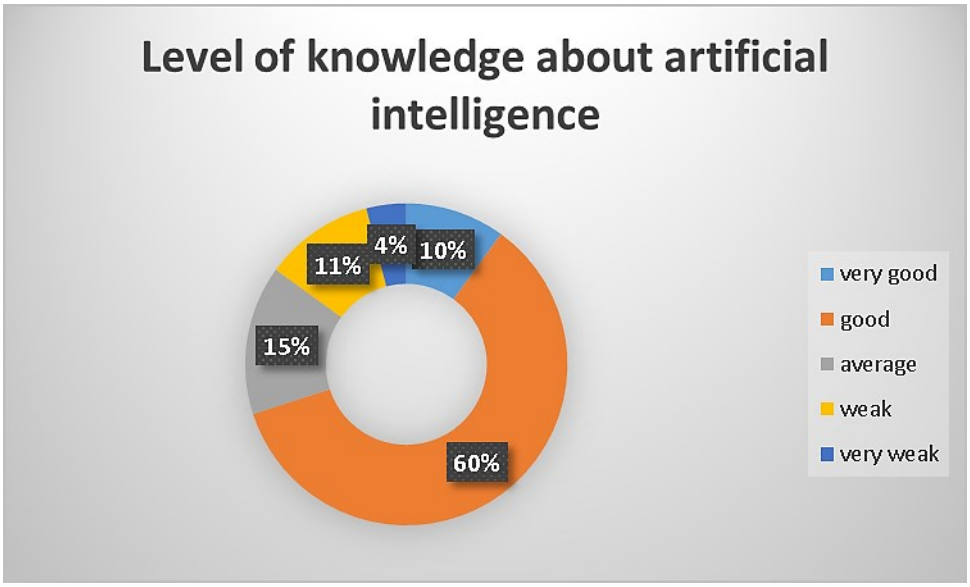

Figure 2. Assessment of the state of knowledge about artificial intelligence.

Source: Survey results – own work.

In response to the question 'Do you think artificial intelligence will affect the labour market in the next 10 years?', the majority of respondents (55%) believe that artificial intelligence will positively affect the labour market. On the other hand, around 37% indicated that it will affect it negatively, which may indicate concerns about potential challenges such as automation or changing job requirements. Only 5% of respondents said they had no opinion on the subject, which shows that the topic is widely discussed and of interest.

The remaining respondents are unlikely to believe that artificial intelligence will affect the labour market at all, but this group is much smaller (3%). These results highlight both hopes and fears about the transformative potential of AI.

Among the opportunities, the most frequently selected answers to the question 'What opportunities do you think the development of artificial intelligence brings?' were: automation of work and increased productivity, the development of green technologies and new educational opportunities. As many as 70% of respondents chose these 3 answers. There were sheets with the answer ticked that AI would improve medical processes. Respondents most frequently cited improvements in motor vehicle safety as their own examples. This distribution of responses suggests that students recognise the positive impact of AI on technology development.

Among the biggest threats posed by AI, respondents cited increased unemployment, increased social inequality, privacy issues and the development of autonomous weapons.

All respondents agreed that AI should be regulated by law. Which shows a high awareness of the risks and abuses that can occur when using tools supported by this solution.

To the question 'To what extent are you concerned that the development of artificial intelligence could negatively affect your future career?', the majority of students answered that they were rather concerned about the negative impact of the solution on their career (52%).

8% of respondents were very concerned and the answer that they were not at all concerned was given by as many as 15%, 5% were rather not concerned and 20% had no opinion.

As many as 83% of students said they regularly use various AI-supported tools, while 11% said they do not use such solutions at all and 6% rather rarely use them. This distribution of responses shows how integral AI-based solutions have become to student learning.

One hundred per cent of respondents believe that artificial intelligence has a positive impact on education and want to further their knowledge in this area. However, only 72 per cent believe that it can be used for ethically questionable purposes.

The results of the survey indicate a high awareness among students of the potential and challenges of artificial intelligence (AI) development. With as many as 83% of respondents regularly using AI tools in the learning process and 100% perceiving their positive impact on education, a wider introduction of AI technologies into higher education curricula is recommended. It is worth focusing on the integration of tools that support the automation and personalisation of learning, such as performance analysis systems, adaptive learning platforms or learning support solutions. At the same time, there should be an emphasis on education about the ethics of using AI and the potential risks, such as privacy issues or the risk of abuse. Such a strategy will not only allow students to be better prepared for the future labour market, but also to develop their competences in a responsible and informed manner towards AI technologies.

On the basis of the literature analysis and the research carried out, the opportunities and threats posed by artificial intelligence to the academic environment are summarised in Table 1.

Table 1.
Opportunities and risks associated with the development of artificial intelligence in the context of students and higher education

Opportunities	**Threats**
Personalization of learning.	Reduction of standardization in education.
AI enables the adaptation of learning pace and style to individual student needs.	Excessive reliance on AI may lead to a lack of consistent educational standards.
Support in the learning process.	Dependence on technology.
AI solutions, such as adaptive platforms, support more effective knowledge acquisition.	Students may become overly reliant on AI tools, limiting their independence in learning.
Improvement in scientific research.	Risk of reduced creativity.
Automation of data analysis and report generation can support scientific research.	Excessive automation may discourage students from independent thinking and innovation.
Improved accessibility to education.	Privacy issues.
AI enables the development of tools supporting learning for people with disabilities.	The collection of student data by AI platforms poses risks of misuse or inadequate storage.
New opportunities for skill development.	Increased pressure to adapt to changes.
The development of AI technologies forces the creation of new curricula addressing labor market needs.	The dynamic development of AI technologies requires students to continuously improve their skills, generating stress and pressure.
Facilitating international collaboration.	Inequality of access.
AI tools make it easier to collaborate academically between universities worldwide.	Not all universities and students have equal access to advanced AI-based technologies.

Source: Survey results – own work.

In summary, the development of artificial intelligence brings both huge opportunities and significant risks. The key challenge is to strike a balance between benefits and risks, which requires appropriate regulation, education and an informed approach to its use in different areas of life.

4. Summary

With the rapid development of artificial intelligence (AI), its role in education is becoming increasingly important. The introduction of tools to support the automation and personalisation of learning, while taking into account education on the ethics and potential risks of AI, can play a key role in shaping the modern and responsible workforce of the future.

A survey on the opinions of students of the Faculty of Management at Bydgoszcz University of Technology on the development of artificial intelligence (AI) revealed both opportunities and threats associated with these technologies. The results show that the majority of respondents see a positive impact of AI on the labour market, highlighting automation, the development of green technologies and new educational opportunities as key benefits. At the same time, concerns about rising unemployment, social inequality and privacy issues reflect an awareness of potential challenges. These findings are in line with previous studies that point to a dualistic approach to AI - as a source of innovation and risks. For example, a study by Zhang et al. (Zhang, McAreavey, Liu, 2022) highlighted that young people see AI as a driver of change in the labour market, but at the same time fear automation and the associated change in job requirements. The presence of such attitudes in different geographical and cultural contexts indicates the global nature of the challenges and opportunities associated with AI.

However, the use of AI in education raises questions about potential side effects, such as the reduction of standardisation in teaching. Higher education institutions are not only places of learning, but also of socialisation, where students build relationships, shared values and a sense of belonging. They are where the culture that binds society together is formed.

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