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Students' Perceptions of the Impact of Generative Artificial Intelligence (GenAI) on Learning in the Classroom or at Home

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Abstract: *The emergence of ChatGPT and other artificial intelligence systems has brought and will continue to bring about significant transformations in various areas of socio-economic activity. Education is no exception, being profoundly influenced by these technological developments. Substantial changes are expected in teaching, learning and assessment processes, impacting both teachers and students. Teachers will need to acquire new skills to integrate artificial intelligence into their teaching activities, and students will have to learn to use these technologies to develop their creativity and innovative thinking skills. These transformations will influence educational curricula and require adjustments in educational policies. Our study focused on how the 292 students of the Politehnica University of Timişoara, of both genders and from 4 years of study, from the undergraduate level, from 9 faculties perceive artificial intelligence and its impact on their learning. Data was collected through a questionnaire that analyzed students' perceptions of the influence of generative artificial intelligence (GenAI) on their learning activities both in the classroom and at home. We also investigated their views on the long-term effects of generative artificial intelligence (GenAI) on education. The results indicate a positive but reserved perception, mainly due to uncertainties about future developments of this technology. This attitude is influenced more by a lack of control over the unknown than by pessimism or a complete distrust of the positive potential of the technology in people's lives.*

Keywords: *generative artificial intelligence; education, learning; assessment; educational perspectives.*

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Introduction

The rapid advancement of artificial intelligence is creating what sociologist Hartmut Rosa calls the "acceleration society"(Erduran & Levrini, 2024; Rosa Hartmut, 2013). In this context characterized by speed, traditional educational systems often appear static, rigid and insufficiently adapted to the pace of change (Erduran & Levrini, 2024; Gherheș et al., 2020; Organization for economic Co-operation and development., 2019).

In the work performed for the documentation of this article we encountered the concepts of Artificial Intelligence (AI) Generative Artificial Intelligence (Generative AI or GenAI) and ChatGPT Generative Artificial Intelligence (GenAI), which is why we will briefly clarify the terms according to Artificial Intelligence (AI) is defined as the field of computer science that focuses on creating systems capable of mimicking human cognitive functions, such as learning, reasoning, speech recognition and decision-making. Generative Artificial Intelligence (GenAI) is defined as a branch of Artificial Intelligence (AI) that can create new content (text, im-ages, sound, code, etc.) based on existing data using advanced machine learning models such as deep neural networks. A concrete example of Generative Artificial Intelligence (GenAI) is ChatGPT developed by OpenAI, i.e. a computer program designed to simulate a conversation with users, usually via a text or voice chat, in an automated way, also called Chatbot (*Introducing ChatGPT*, 2025).

In the first three months after the public launch of ChatGPT (December 2022 - February 2023), it was analyzed from multiple perspectives: as an additional digital tool, a disruptive technology, or a means that separates the thinking process from the writing process (Jensen et al., 2024). Jensen et al. (2024) summarize some conclusions regarding the transformation of teachers' institutional and pedagogical practices. It summarizes some conclusions on the transformation of teachers' institutional and pedagogical practices with the use of generative artificial intelligence (GenAI). It can support teachers in course preparation and should therefore be integrated into the curriculum. At the same time, students will also be confronted with new ways of independent learning through the use of generative artificial intelligence (GenAI). It also stimulates critical thinking in students. Furthermore, it supports writing and editing. It also works as a personal tutor.

This perspective highlights the potential for technology to reshape both higher education and the relationship between teachers and students.

Emerging technologies and the widespread use of generative artificial intelligence (GenAI). Such tools are rapidly transforming the higher education landscape. This change brings both opportunities and challenges, altering teaching and assessment methods as well as learning experiences.

In this context, our study aims to survey how UPT students perceive the impact of the wave of generative artificial intelligence of educational technology on their own learning process in the classroom and at home. All this was contextualized in 4 objectives and 5 research questions, detailed in the methodological part. Compared to other research referring to the impact (GenAI) on students' learning activity(Gherheş & Obrad, 2018; Tominc & Rožman, 2023). Our study aims to detail through various parameters how GenAI influences students' learning activity. The study aims to find out the study respondents' loose representation of generative AI (Gen AI). Thus, for the impact of GenAI on the learning activity at the University, we looked for the following parameters: improvement of the learning environment in the classroom, students' individual study and documentation/research practices, additional clarifications beyond those given by the teacher, fulfillment of students' learning needs, additional educational support provided by GenAI, change in the way new skills are acquired, how communication with the teacher is affected or the diminished role of the teacher in the classroom. In the case of learning at home, we focused on the following parameters: the speed of learning activities, the improvement of grades obtained at university, self-confidence in relation to the teaching activity, the way of doing homework with the help of GenAI. The last objective refers to how, the educational process will be affected in the future, from the respondents' perspective.

Reviewing the literature

The context of change in higher education

The COVID-19 pandemic has accelerated the use of digital teaching, leading to the widespread implementation of collaborative technologies and innovative pedagogical frameworks such as gamification, agile approaches or emerging technologies. Gamification, as the integration of playful elements into the learning process, would not be new, but through the use of artificial intelligence it represents a challenge for educational work (Rauschenberger, M., Willems, A., Ternieden, M., and Thomaschewksi, J., 2019; Schön et al., 2023a). Increased adaptability in teaching methodologies through so-called agile active learning approaches, adopts its 12 specific learning principles (Neumann, M. & Baumann, 2021; Schön et al., 2022; 2023b) which are again

a novelty in digital learning. The inclusion of assistant robots in teaching and the use of artificial intelligence are part of the so-called emerging technologies (Buchem, I., and Baecker, N. Nao, 2022; Schön et al., 2023b).

According to the UNESCO Guide (2023), technologies of generative artificial intelligence (GenAI) , have significant potential to transform higher education by: Improving teaching and learning through personalization and accessibility; Stimulating research through advanced analytics tools; Optimizing educational administration through automation; Increasing community engagement through collaborative and interactive methods.

For these opportunities to be harnessed ethically and responsibly, it is essential that legislative initiatives as well as educational programs promote a holistic understanding of artificial intelligence. Both the proposed EU regulations and UNESCO guidance are fundamental steps towards reaching a that benefits society as a whole.

Integrating emerging technologies, such as generative artificial intelligence (GenAI), into the educational process can help improve the teaching and the learning experience.

Integrating emerging technologies, such as generative artificial intelligence (GenAI), into the educational process can help to improve the teaching and learning experience. For example, accelerated population growth in developing countries is creating considerable challenges for the higher education system, leading to overcrowding, limited resources and the declining quality of education, particularly in profit-oriented private universities such as those in Bangladesh. In this context, innovative technologies, such as Artificial Intelligence (AI) offer opportunities for personalized teaching support (Chanda et al., 2025; Dai et al., 2025).

According to the authors, the use of ChatGPT in the educational process should complement traditional methods, not replace them (Ali et al., 2024). Its effective integration should aim to: a) Increase students' engagement by providing interactive and personalized experiences or the opportunity to solve complex problems through dialogue and simulations; b) Further support in learning through access to detailed explanations and additional resources or facilitate the comprehension process through immediate answers. In order to succeed, educators must be trained in the use of GenAI, both technically and pedagogically, to maximize its potential (Ali et al., 2024).

The emergence of generative artificial intelligence has led to academic integrity issues through increased risks of plagiarism and cheating in assessments (Lye & Lim, 2024) or difficulties in identifying automatically

generated texts, which can compromise authentic assessments. Another issue is related to the re-evaluation of assessment methods that requires the development of new strategies that value critical thinking and creative problem solving.

Studies show that although teachers show openness to ICT integration, they predominantly use the technology in basic activities such as: Computer-based practice; Searching for information online; Simple data processing. According to the SAMR (Substitution, Augmentation, Modification, Redefinition) model, the integration of ICT in teaching can be divided into four levels: Substitution (Technology replaces traditional methods without significantly different functionality); Augmentation (Technology enhances existing tasks); Modification (Technology transforms teaching processes); Redefinition (Creates completely new tasks that are impossible to accomplish without ICT). Most teachers remain in the initial stages (Substitution and Augmentation), which limits the positive impact of ICT in education (Amir, 2023). As a result, strategic integration of generative artificial intelligence (GenAI) would entail creating guidelines to address the risks of academic integrity and training teachers to use it effectively. Promoting the advanced adoption of ICT involves encouraging the shift from substitution and augmentation to modification and redefinition, following the SAMR model. Assessment requires a focus on critical skills such as analysis, creativity, and applicability of knowledge. These could contribute to the sustainable transformation of higher education by integrating emerging technologies in a responsible and efficient way.

The COVID-19 pandemic has produced a rapid and profound change in the global education system. The closure of educational institutions forced the almost instantaneous transition to online learning and accelerated discussions about the use of generative artificial intelligence (GenAI) in education. However, effective implementation of GenAI depends crucially on the skills and attitudes of teachers. The crisis caused by COVID-19 has had several key impacts on education: accelerated adoption of digital technologies through alternative methods. As a result, e-learning platforms and collaborative applications, have been widely adopted. The need for rapid use of advanced technologies to support the educational process has increased interest in GenAI. The success of GenAI implementation depends on the willingness of teachers to adopt new technologies (Kim & Kim, 2022). Teachers, for the most part, do not have concrete experience with the use of GenAI in education, and many do not have a clear idea of how GenAI tools could be integrated into the teaching process.

According to studies, most teachers require training to develop the skills needed to use GenAI in the classroom (Mikeladze et al., 2024; Sostero & Tolan, 2022). GenAI skills include: critical evaluation of GenAI technologies; effective use of GenAI in diverse instructional settings; and developing and adapting instructional materials to machine learning-based technologies (Edwards et al., 2018). The transition to GenAI-supported education requires a well-planned approach that balances technology with pedagogical needs and provides support for teachers to embrace the change.

A survey of business and economics students at different levels of study revealed significant differences in their understanding of the importance of GenAI. Despite this, no major variations were found in their perception of their role on the future labor market, which is increasingly characterized by GenAI (Tominc & Rožman, 2023). Students modestly evaluate their future roles, suggesting a lack of confidence or understanding of the impact of GenAI on jobs. A more active integration of GenAI into the educational process is definitely needed to better prepare them for the technology-driven labor market.

Another challenge, with the advent of GenAI and its use in education, is that of ensuring the originality of students' work especially in the context of hybrid human-AI writing (Luo (Jess), 2024a). Situations may arise where current policies that distinguish GenAI-assisted work' from 'original work', which may discourage the use of GenAI for legitimate educational purposes. On the other hand, there is a risk of stigmatizing students who use GenAI as less independent. Another issue may also arise suggested by Eaton (2023) who argues that GenAI-generated texts often become collaborative through human edits and revisions. This complicates the separation of human and GenAI contributions (Luo (Jess), 2024b).

As a result, universities and their policies need to recognize and value human-AI hybrid writing as a legitimate form of creativity. This should be done by clarifying acceptable uses of GenAI in assessments through explicit guidelines and instructions for teachers and students.

The development of GenAI also raises questions about the distribution of labor between humans and technology. While human creativity remains a key asset, GenAI is increasingly demonstrating creative potential. Future jobs will involve collaboration between humans and GenAI, rather than strict separation of tasks. Soft skills such as creativity and adaptability will remain essential for humans.

Under these conditions, in order to prepare the new generations to adapt to the new challenges of the labor market, actions are needed on several levels: integrating GenAI into the university curriculum, preparing

students for a collaborative human-AI labor market, and adopting university policies that recognize and promote the use of GenAI as part of the creative and educational process.

Educating for the future of AI requires a coordinated effort to support both teachers and students to develop their skills and confidence in using these technologies. An adapted curriculum and flexible policies will play a key role in preparing future generations. All these studies talk about how wonderful artificial intelligence is and how important it is in adapting curricula to prepare future generations. We set out to see things the other way around, i.e. what the recipients of these technologies, i.e. ChatGPT generative artificial intelligence, think. We wanted to find out how they perceive all these things and that is why we set the particular objectives of the study.

Research methodology

The aim of the study was to determine the impact of artificial intelligence on the educational process from the perspective of the respondents, students at the Polytechnic University in. In order to achieve this, towards operationalizing the proposed aim of our research, we set 4 research objectives.

Objective 1: Students' general perception of artificial intelligence
Objective 2: Students' perceptions on the use of artificial intelligence in classroom education
Objective 3: Students' perception of the use of artificial intelligence in personal learning
Objective 4: Students' perception of how artificial intelligence would affect future educational work

For the study, we used a questionnaire addressed to the students of the Politehnica University of Timisoara. Data collection took place between May and June 2024. We obtained a sample consisting of 292 respondents. The respondents included in the study, selected from all years of study at our university. Relative to the total institution of about 13,000 students, the margin of error was estimated at ±5.7%. This error shows the maximum likely deviation of our results from the true value in the total of the student population of the university where we performed the study (Petchkovsky et al., 2013). The sample was randomly stratified, and stratification was done according to year of study, faculty, gender of respondents and area of residence.

Data collection was done through voluntary participation of the respondents and was completed online on respondents' mobile phones, all students owning such a device. The average time to complete a questionnaire was 10 minutes and the response rate was 50%.

The applied questionnaire was validated through an evaluation process by sociological experts and qualitative and quantitative tests. The questionnaire instrument included a variety of questions, both closed and open-ended, and concluded with a series of specific questions related to demographic elements such as respondents' gender, age, year of study and background. SPSS Statistics software was used to analyze the data collected (Howitt & Cramer, 2008).

In the questionnaire used, the objectives were transformed into research questions as follows:

1. What would be the first three words that come to your mind that you would associate with generative artificial intelligence (GenAI)? (Objective 1)
2. To what extent do you agree with the following statements regarding the use of generative artificial intelligence (GenAI) in classroom education? (Objective 2) (Corresponding to the question we had 8 statements)
3. To what extent do you agree with the following statements related to personal learning and the use of generative artificial intelligence (GenAI)? (Objective 3) (Corresponding to the question we had 7 statements)
4. How does it make you feel to think about what might happen in the future due to the development of generative artificial intelligence (GenAI)? (Objective 4)
5. To what extent do you agree with the following statements in relation to your role in a workplace of the future using generative artificial intelligence (GenAI)? (Objective 4)

Results

Objective 1: Students' general perception of artificial intelligence

This objective was verified by a test associating the generative artificial intelligence (GenAI) with the first 3 words that come to respondents' minds (Table no.1) using the following question: What would be the first three words that come to your mind that you would associate with generative artificial intelligence (GenAI)?

Table 1. Associations between generative artificial intelligence (GenAI) and words that come to respondents' minds

No.	First three words	Frequency	Percent
1	help, usefulness, projects, support	88	30.1
2	efficiency, swiftness, automation	71	24.3
3	creativity, innovation, evolution	46	15.8
4	intelligence, technology, data bases, machine learning, future	39	13.4
5	information	14	4.8
6	incompetence, uncertainty, non-thinking	8	2.7
7	interesting	6	2.1
8	I don't know / I will not answer	20	6.8
	Total	292	100.0

Source: Authors' own concept

The best representation in people's heads is in the form of free associations, an adaptation of a test devised by psychologist / psychiatrist Carl Gustav Yung (Petchkovsky et al., 2013). To this question our respondents ranged from helpful to insecure. If we are to take them in turn the answers related to helpfulness, usefulness, projects, support were on first place with 30.1% of the answers (Table 1). Next came the answers related to efficiency, speed, automation with 24.3%. Creativity, innovation, evolution came third with 15.8%. Close behind, fourth place is claimed by the contribution of intelligence, technology, databases, machine learning, future with 13.4%. Over 10 percent away comes a collection of minor responses. With 4.8 percent we find the association with information. With 2.7% we find pessimistic answers in the form of uncertainty, non-thinking, incompetence. An undecided answer is the one in the form of it being interesting with 2.1%. There is also a 6.8% of people who did not answer or did not know how to answer. As can be seen from the answers the vast majority perhaps associated them with something useful or positive. A very small number of respondents associate it with insecurity or incompetence.

Objective 2: Students' perceptions on the use of artificial intelligence in classroom education

For this objective, we used the question: To what extent do you agree with the following statements regarding the use of generative artificial intelligence such as Chat GPT in classroom education? Corresponding to the question we had 8 statements contained in Table 2.

Table 2. Assertions regarding the use of generative artificial intelligence in classroom education

Statements	To a very small extent / Not at all	To a small extent	To an appropriate extent	To a high extent	To a very high extent	Average
2.1. Using GenAI can improve the classroom learning environment for students.	7.2	14.8	36.5	22	19.5	3.32
2.2. AI tools will have a major impact on students' individual study and documentation / research practices	4.3	10.9	26.8	27.9	30.1	3.68
2.3. AI clarifies on many points that the teacher cannot cover in his explanation.	27.8	20.5	29.9	13.2	8.2	2.55
2.4. AI meets and complements students' learning needs	3.6	5.8	18.2	33.9	38.3	3.97
2.5. AI allows students to get additional instructional support for what the teacher is doing in a classroom.	17.1	28	25.5	17.1	12.4	2.80
2.6. AI changes the way students acquire skills in certain subjects.	8.0	19.6	32.7	21.8	17.8	3.22
2.7. The role of the teacher will diminish when the student uses artificial intelligence to learn certain subjects	6.5	14.8	26.0	28.9	23.8	3.49
2.8. Using GenAI affects the ability to communicate with the teacher.	22.2	24.3	28.1	16	9.4	2.66

Source: Authors' own concept

In order to determine how artificial intelligence would influence the learning process we used a series of 8 statements to which our respondents answered as follows (Table no.2)

For the first statement *The use of GenAI can improve students' classroom learning environment*, the collected responses amounted to the following percentages: *to a very little extent / not at all* - 7.2%; *to a little extent* - 14.8%; *to an appropriate extent* - 36.5%; *to a great extent* - 22%; *to a very great extent* - 19.5%. The distribution of the answers to this statement shows us an optimism of the respondents as 78% of them lean towards optimistic answers, i.e. in the upper part of the scale. For the statement GenAI tools will have a major impact on students' individual study and documentation / research practices we recorded the following responses: *to a very little extent / not at all* - 4.3%; *to a little extent* - 10.9%; *to an adequate extent* - 26.8%; *to a great extent* - 27.9%; *to a very great extent* - 30.1%. This time respondents' optimism is even higher, with 58% opting for the options to a great extent and to a very great extent. As for the third statement GenAI clarifies on many points what the teacher cannot cover in their explanation, the collected answers seem not to be as optimistic: *to a very little extent / not at all* - 27.8%; *to a little extent* - 20.5%; *to an adequate extent* - 29.9%; *to a great extent* - 13.2%; *to a very great extent* - 8.2%. This time the respondents had a distribution of 78.2% on the first steps of the scale. The teacher's explanation seems not to be so easily replaced by artificial intelligence in the respondents' opinion. For the fourth statement follows: *to a very little extent / not at all* - 3.6%; *to a little extent* - 5.8%; *to an adequate extent* - 18.2%; *to a great extent* - 33.9%; *to a very great extent* - 38.3%. This statement is also characterized by optimism on the part of the respondents, i.e. 72.2% of them gave statements at the upper end of the scale. For the statement *GenAI allows students to get additional educational support for what the teacher does in the classroom* the responses were: *to a very little extent / not at all* - 17.1%; *to a little extent* - 28%; *to an appropriate extent* - 25.5%; *to a great extent* - 17.1%; *to a very great extent* - 12.4%. With 55% of respondents at the upper end of the scale we are shown a reserved optimism about additional support from AI for what the teacher would do in the classroom. For the statement *GenAI changes the way students acquire skills in certain subjects* the results were: *to a very little extent/not at all* - 8.0%; *to a little extent* - 19.6%; *to an appropriate extent* - 32.7%; *to a great extent* - 21.8%; *to a very great extent* - 17.8%. According to these answers, the vast majority of respondents (72.3%) believe that GenAI will bring about a change in the way pupils / students will learn. For the following statement: *The role of the teacher will diminish when the student uses artificial intelligence to learn certain subjects* the results were: *to a very little extent / not at all* - 6.5%; *to a little extent* - 14.8%; *to an appropriate extent* - 26.0%; *to a great extent* - 28.9%; *to a very great extent* - 23.8%. The vast majority (78.7%) believe that the role of the teacher will be

diminished by the use of artificial intelligence or they will have to reinvent the didactic framework under the new technological conditions. For the statement: *The use of GenAI affects the ability to communicate with the teacher*, the answers collected were as follows: *to a very little extent / not at all* - 22.2%; *to a little extent* - 24.3%; *to an appropriate extent* - 28.1%*; to a great extent* - 16.0%; *to a very great extent* - 9.4%. As it can be seen, a large majority of student respondents (74.6%) are of the opinion that the AI will not affect the relationship part of the teacher-student interpersonal interaction.

Objective 3: Students' perception of the use of artificial intelligence in personal learning

For this objective we used the question: to what extent do you agree with the following statements related to personal learning and the use generative artificial intelligence? This was accompanied by 7 statements that the students in the sample were asked to respond to and the results are mirrored in Table 3.

Table 3. Claims related to personal learning and the use generative artificial intelligence (GenAI)

Statements	To a very small extent / Not at all	To a small extent	To an appropriate extent	To a high extent	To a very high extent	Average
3.1. Using GenAI enables me to accomplish learning activities and responsibilities faster.	9.0	14.6	30.9	27.4	18.1	3.31
3.2. The use of GenAI allowed me to improve my grade point average.	13.2	27.4	32.3	17.0	10.1	2.83
3.3. The use of GenAI improves the effectiveness of my study	28.8	26.4	26.0	11.8	6.9	2.42
3.4.The use of GenAI makes my study obligations easier	21.5	20.4	24.5	17.9	15.7	2.86
3.5. The use of GenAI is generally useful	5.6	10.5	28.8	27.7	27.4	3.61
3.6. The use of GenAI has made me more confident in relation to my teaching activity	23.6	27.1	29.2	14.9	5.2	2.51
3.7. When I get an assignment / project to solve I first think about how to use GenAI for it	4.7	16.4	33.5	24.7	20.7	3.40

Source: Authors' own concept

We tried to capture the personal learning activity through seven statements (Table 3). For the first one: *The use* of *GenAI enables me to accomplish learning activities and obligations faster*, the results were: *to a very little extent / not at all* - 9.0%; *to a little extent* - 14.6%; *to an appropriate extent* - 30.9%; *to a great extent* - 27.4%; *to a very great extent* - 18.1%. From the answers obtained (76.4% at the upper end of the scale), it is clear that the vast majority of respondents expect greater speed in solving educational tasks through the use of GenAI. In terms of the specific learning outcome measured by grades and mirrored in the statement: *The use of GenAI has allowed me to improve my grade point average* the results were not so optimistic: *to a very little extent / not at all* - 13.2%; *to a little extent* - 27.4%; *to an adequate extent* - 32.3%; *to a great extent* - 17%; *to a very great extent* - 10.1%. There was an 40.5% of answers in the first part of the scale compared to 27.1% in the upper part of the scale, the rest being rather in the middle as attitude. For the statement: *The use of GenAI improves the effectiveness of my study*, the results obtained were: *to a very little / not at all* - 28.8%; *to a little extent* - 26.4%; *to an appropriate extent* - 26%; *to a great extent* - 11.8%; *to a very great extent* - 6.9%. With 55.2% in the first two lines of the scale, there was no evidence so far in our respondents that their study had significantly improved. For the next study-related statement: *The use of GenAI makes my study obligations easier*, the results obtained show a rather balanced distribution of answers*: to a very little extent / not at all* - 21.5%; *to a little extent* - 20.4%; *to an appropriate extent* - 24.5%; *to a great extent* - 17.9%; *to a very great extent* - 15.7%. For the statement: *The use of GenAI is generally useful* the results were: *very little / not at all* - 5.6%; *to a small extent* - 10.5%; *to an appropriate extent* - 28.8%; *to a large extent* - 27.7%; *to a very large extent* - 27.4%. The results show a major optimism of the respondents regarding the usefulness of generative artificial intelligence, with 83.9% opting for the last 3 lines of the measurement scale. The "Confidence quotient" in relation to teaching activity measured by the statement: *The use of GenAI has made me more confident in relation to my teaching activity*, showed the following distribution of responses: *to a very little extent / not at all* - 23.6%; *to a little extent* - 27.1%; *to an adequate extent* - 29.2%; *to a great extent* - 14.9%; *to a very great extent* - 5.2%. With majority percentage responses in the first three lines of the measurement scale (79.9%) respondents do not feel more confident with the use of GenAI in educational activity. The emergence of these GenAI tools led to specific behaviors measured by the statement: *When I get an assignment / project to solve I first think about how to use GenAI for it*, with the following distribution: *to a very little extent / not at all* - 4.7%; *to a little extent* - 16.4%; *to an appropriate extent* - 33.5%; *to a great extent* - 24.7%; *to a very great extent* - 20.7%. With 78.9% of the responses in the upper part of the scale shows us rather a behavior of relying on GenAI or using GenAI in performing different educational tasks.

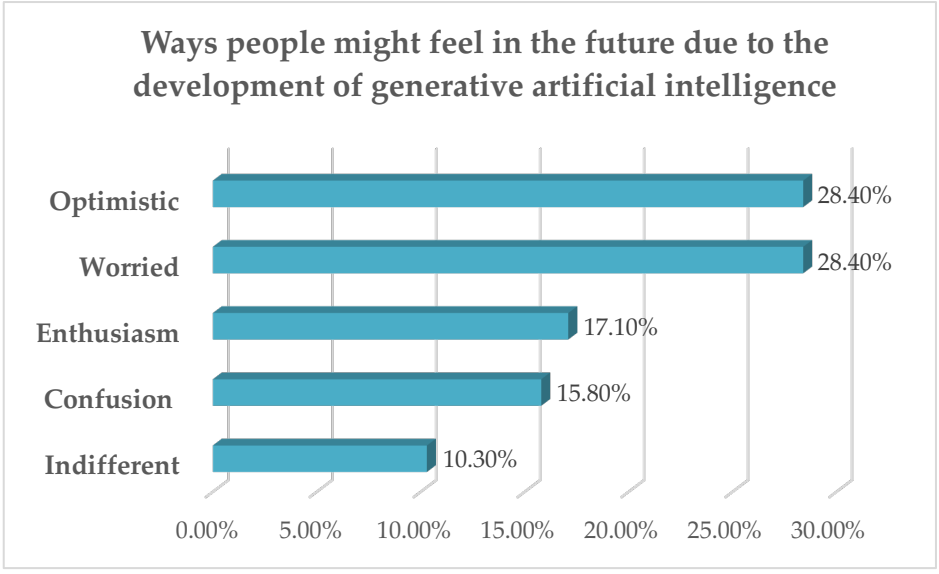
Objective 4: Students' perception of how artificial intelligence would affect future educational work

In order to reach this particular objective, we used 2 research questions:

- How does it make you feel to think about what might happen in the future due to the development of generative artificial intelligence (GenAI)?
- To what extent do you agree with the following statements in relation to your role in a workplace of the future using type generative artificial intelligence (GenAI)?
  The results are shown in Figure 1 and Table 4.

The answers to this question are interesting. Thus, 28.4% of respondents are optimistic about their future using artificial intelligence, while a similar percentage are worried. Enthusiasm characterizes 17.1% of respondents. There is confusion among 15.8% of respondents. There is also a 10.3% of respondents who are rather indifferent. If we add up the so-called positive answers (optimistic and enthusiastic), we get 45.5% of people who see the positive side of this digital tool. In opposition, 28.4% are worried. (Figure no.1).

Figure 1. Looking into the future with the development of generative artificial intelligence (GenAI)



Source: Authors' own concept

Perceptions of the negative effects of GenAI are manifold (Table 4). We tried to order and categorize them according to the answers received. *Disinterest, dependency, decreased creativity* (21.9%), followed by *less thinking, functional illiteracy and brain atrophy* (12%), followed by *laziness and convenience* (9.6%), followed by *errors and manipulation of false information* (7.9%), and 4.8% of respondents believe that the use of artificial intelligence *would affect communication, empathy, sociability, attention*.

Table 4. The negative ways in which generative artificial intelligence (GenAI) could affect education in the future

No.	**The negative ways in which generative artificial intelligence (GenAI) might affect the educational process in the future**	**Frequency**	**Percent**
1	disinterest, dependency, decreased creativity	64	21.9
2	less thinking, functional illiteracy, brain atrophy	35	12
3	laziness, comfort	28	9.6
4	errors, manipulation of false information	23	7.9
5	would affect communication, empathy, sociability, attention	14	4.8
6	disappearing jobs	10	3.4
7	copying, plagiarism	10	3.4
8	diminishes the role of the teacher to the point of disappearance	9	3.1
9	no reading, no learning, no culture	9	3.1
10	help with homework	1	0.3
11	retraining in certain areas	1	0.3
12	other influences (replacement of some subjects, more information)	2	0.7
13	I don't know / I will not answer	76	26
14	there are no negative influences	10	3.4
15	Total	292	100

Source: Authors' own concept

The prospect of *jobs disappearing* also appeared for 3.4% of respondents. Because we are talking about education, another negative effect was seen in the form of *plagiarism and copying* information by 3.4% of respondents. Some respondents see the role of the teacher *diminishing to the point of disappearance* (3.1%). Another 3.1% of the answers represent the opinion of those who believe that there will be *no more reading, no more learning and the emergence of a lack of cultural* information. Another perspective that we are not sure it can even be considered negative, is the one related to *homework assistance* for 0.3% of the respondents. While some of the respondents said that some jobs would

disappear, others thought that retraining in some areas would occur (0.3%). There were also respondents whose answers we put in the category of other influences (replacement of some subjects, more information) with 0.7%. And 26% of the respondents were in the category of those who did not know what the effects would be or did not answer. For 3.4% of respondents there were no apparent negative influences.

Comments and discussions

The results of this study reveal mixed and varied perceptions of the use and impact of generative artificial intelligence (GenAI) both in education and personal life. Analysis of the responses provided by the participants outlines several observations.

Respondents frequently associate GenAI with positive terms such as '*helpful*', '*useful*' and '*creative*'. These responses predominate, indicating a major potential recognized in the use of this type of technology for support and innovation. However, there is also a minority who link this technology with '*insecurity*' or '*incompetence*'.

Most participants believe that GenAI can improve the educational process by supporting individual learning and complementing teacher explanations. However, there are reservations about the impact on direct teacher-student communication and on replacing the role of the teacher entirely. The distribution of the responses shows that respondents see GenAI as a complementary tool, but not sufficient to completely replace the traditional teaching framework.

The use of GenAI is perceived as a means to simplify educational tasks and accelerate their completion. However, the effects on concrete outcomes, such as improved grades or overall study efficiency, are viewed less optimistically. The responses suggest that while GenAI is useful, it does not necessarily lead to a significant increase in personal confidence in relation to studying.

Respondents are divided between *optimism* (28.4%) and *concern* (28.4%) about the long-term impact of GenAI on society. A significant proportion express *enthusiasm* (17.1%), but there is also *confusion* (15.8%) or *indifference* (10.3%). These results reflect both the hopes and uncertainties generated by rapid technological progress.

Our findings align with other research, showing that students exhibit a sophisticated skepticism towards GenAI-based tools and wish to maintain their intellectual autonomy even when using them (Black & Tomlinson, 2025). Additionally, confusion or indifference may result from the pitfalls associated with the use of artificial intelligence, particularly regarding data authenticity and ethical conduct (Tierney et al., 2024).

Educational behaviors suggest a growing tendency to use GenAI for specific tasks, such as homework or projects. However, overuse could lead to technology addiction at the expense of traditional methods of studying and learning.

Limitations and future research directions

Despite the contribution of this study to understanding students' perceptions of artificial intelligence in education, there are some methodological and conceptual limitations that are worth to be discussed and accessed in future research:

- Sample size: Our study is conducted on a small sample size, but it has helped us to formulate some trends in the use of artificial intelligence by younger generations. Extending the research to multiple universities and academic fields is a priority that will allow us to benchmark more robustly, following the model already existing in other universities, for example in Asia (Dai et al., 2025).
- Self-reporting: The data collected reflects subjective perceptions that may be influenced by social or cognitive factors. In future research we could integrate complementary methods (observation, group interviews, etc.) that would help to validate and deepen the results.
- Margin of error: With a margin of ±5.7%, the results are statistically valid, but the precision can be improved by increasing the sample size and applying stratified sampling.
- Lack of a pilot study: Our instrument, the questionnaire, has been theoretically validated. Future research variants may include a pretest that will enhance the clarity of wording and accuracy of responses. We may also be able to add to the refinement of the research methodology.
- Cross-sectional design: The study captures perceptions at a fixed point in time, limiting the ability to track changes over time. We will hope to replicate our study periodically to complete a longitudinal design that allows for the analysis of attitudinal changes as a function of continuous exposure to AI.
- Response rate of 50%: We consider this rate to be acceptable, and although it may hide non-response biases, we have made an effort to include students from all faculties of the university and from different years of study. In doing so, we have minimized some of the biases that may arise in such studies.
- Gaps resulting from student-centered research: The study emphasizes the student voice often neglected in literature. We intend

to mirror the students' perspective with that of teachers by generating comparative studies in this regard, in future research.

- Ethical issues: Although plagiarism is mentioned, the ethics of using AI involves complex issues such as algorithmic bias, decision transparency or personal data protection. These issues will also be a priority in our future research.

Conclusions

This study highlighted how students at the Polytechnic University of Timisoara perceive the impact of generative artificial intelligence (GenAI) regarding the educational process, both in the classroom and in individual learning activities. The results obtained indicate a predominantly positive attitude, but not without reservations, towards the use of GenAI in education.

The majority of respondents believe that GenAI helps to make learning more effective, to clarify educational content and to support teaching activities, especially in terms of personal learning. At the same time, they remain wary of potential negative effects, such as diminishing the role of the teacher, the risk of dependence on technology or impairing creativity.

The study emphasizes that GenAI is perceived as a complementary tool rather than a replacement for the traditional didactic framework. Despite its obvious usefulness, the technology does not yet seem to generate a significant increase in students' confidence in their own academic abilities, suggesting the need for more integrated and conscious digital education.

Looking to the future, students' views are divided between optimism, enthusiasm, but also concern or confusion, reflecting the complexities of adapting to a changing educational environment. There is a need for educational institutions to develop clear policies regarding GenAI integration, to promote its ethical use, and invest in the training of teachers and students to fully exploit the potential of these emerging technologies.

To facilitate the integration of AI in education, close collaboration among educators, researchers, educational institutions, and decision-makers is essential. Schools and universities should invest in continuous teacher training, the development of digital skills, and a deeper understanding of both the advantages and limitations of generative artificial intelligence (Cordero et al., 2024). Appropriate user education on the responsible and ethical use of GenAI is needed (Salem et al., 2025). Therefore, GenAI can become an important catalyst for educational innovation, provided that its introduction is accompanied by critical reflection, appropriate regulation and a balance between technological benefits and real pedagogical needs.

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