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# University students' perceptions of using generative artificial intelligence tools for learning English language

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## ABSTRACT

Generative artificial intelligence (GAI) tools such as ChatGPT, Google Gemini (Bard) and Claude AI have emerged as powerful tools in different aspects of English language learning. These tools provide online learners with personalized, interactive, engaging and productive language learning experiences. Unlike traditional AI, GAI analyses users' data to create up-to-date and consistent outputs based on previously entered data. The paper explores university students' perceptions of using GAI tools for learning the English language. The study was conducted at International University of Sarajevo in Bosnia and Herzegovina. The research draws on the theoretical models of Borgmann, Davis and Shoufan. An adapted survey was distributed to university students enrolled in different programs, whereby the total number of 226 students participated in the survey (N=226). The research investigated students' perceptions of GAI tools, their usefulness, technical usage, and positive and negative attitudes towards GAI. The independent variables included students' gender and the field of study. The research results offer insights into current trends in university students' English language learning and the use of GAI tools, which have become an integral part of university education.

**Keywords**: Generative artificial intelligence (GAI), Education, English language learning, University students' perceptions

## 1. Introduction

Artificial Intelligence (AI) technology has been developing quickly and is being applied in various fields (Figure 1. The taxonomy of AI). AI tools, such as speech recognition, natural language processing, machine translation and others, have proven to be very efficient and helpful, especially for students of English as a Foreign Language (EFL) [1]. Language technologies assist students in practicing their speaking and listening skills through personalized support and instant feedback. Natural language processing technology focuses on enhancing students' writing skills, while machine translation helps students who speak different languages communicate with one another effectively. Examples of AI technology include machine learning/deep learning, particularly through multi-layer artificial neural networks (ANN). These technologies have real-life applications, for example, in cyber-physical behavior detection [2], [3], load and price predictions in power systems [4], [5] and in the ocean drilling program in geology [6], [7].

Generative Artificial Intelligence (GAI) is a part of the AI field, specifically a machine learning algorithm. GAI technology generates new content from various data types, including audio data, programming codes, images, simulations, videos and texts, often based on prompts or questions. It functions as a natural language processing tool, allowing users to interact and receive responses in the natural language. GAI is built on the Generative Pre-Trained Transformer (GPT) architecture, which is a type of a large language model

algorithm characterized by three main features: a) the ability to generate content that appears to be written by a person, b) training on extensive amounts of text from books, articles, websites and more, and c) understanding the connections between words, context and even emotions. In fact, GPT is a family of AI models (large language models) that gives AI apps the ability to generate, create and analyze images, interpret data and more. GAI models are among the largest artificial neural networks with hundreds of billions or even trillions of parameters. In other words, GAI models learn the structures and patterns from the vast input training data and then generate new data content with similar characteristics. Simply put, GAI models' architecture is based on transformers, a type of artificial neural networks architecture, that are pre-trained on large data using unsupervised training methods. We can think of it as a personal assistant or a tutor. It can be used in different ways, for example, as a tutor, to learn new things fast. That includes learning a new language. For instance, some research outputs have suggested creating an "Education Meta-Universe", a virtual environment where students from all over the world can get together, learn and interact with one another using AI-based virtual teachers' platform [1].

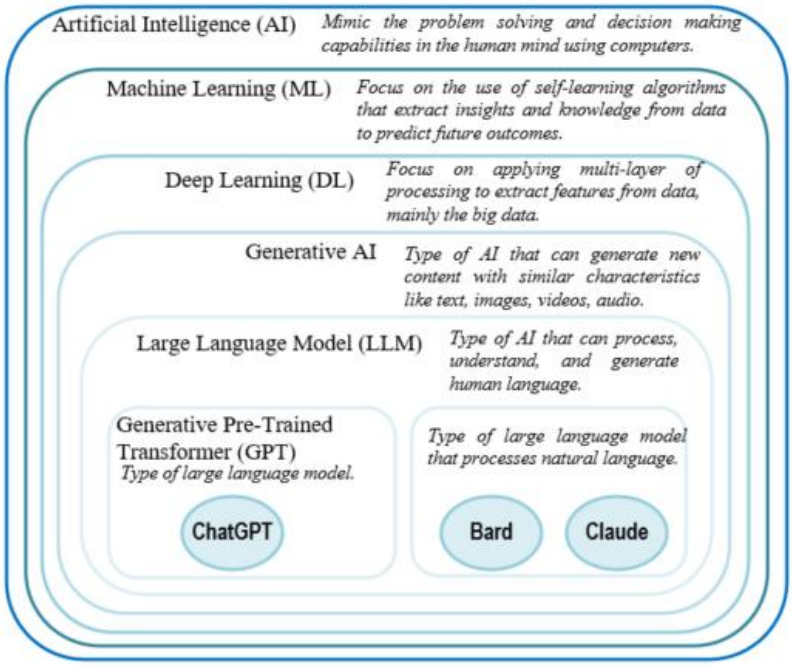


Figure 1. The taxonomy of Artificial Intelligence

GAI tools in language learning are diverse. For the purpose of this study, we will describe the most essential GAI tools. First, ChatGPT (https://chat.openai.com/) [8] is a chatbot app or software tool powered by GPT that relies on a set of GPT parameters, has been optimized for dialog and conversation and has content filters. It was developed by an open AI Company in the United States, developing artificial general intelligence products. ChatGPT is a powerful language model with a combination of various techniques, including Deep Learning (DL), Machine Learning (ML), Artificial Neural Network (ANN) and Natural Language Processing (NLP). It is important to note that ChatGPT openly states its limitations on its website, noting that it may occasionally generate wrong information, produce harmful instructions or have biased content. Many users engage with ChatGPT to ask various questions or prompts, receiving various logical responses on a wide range of subjects, including English language learning. ChatGPT is being increasingly used in the education sector and has recently been shown to complement and enhance traditional teaching and learning methods for EFL [9].

Second, Google Gemini [10], formerly known as Bard, is another AI-based chatbot and a large multimodal language model. It stimulates human conversations using natural language processing and machine learning (https://bard.google.com/). Gemi integrates language, audio, code and video understanding, allowing it to

perform multiple tasks including text summarization, text generation, text translation, image understanding, audio processing, video understanding, multimodal reasoning, and code analysis and generation. It has been programmed not to respond to offensive questions and includes a "Google it" button. Like other chatbots, Bard has certain limitations, including the potential for misinformation and bias.

Claude AI (https://claude.ai/) [11] is another chatbot from a family of large language models (LLMs) that uses AI to process natural language, including text and images. Developed by Anthropic Company which released the first model in March 2023, Claude AI is designed to compete with ChatGPT. It has also been explored for the use in teaching and learning methods, serving as a personal tutors or a language assistant.

Due to some challenges, concerns and ethical issues surrounding GAI technologies – particularly cheating and plagiarism, an increasing number of teachers and higher education institutions have banned their students from using AI tools in writing or submitting their theses, essays, and other works. Other challenges posed by GAI technologies include the fact that some students miss human interactions with their face-to-face teachers. Additionally, a significant concern is that the content materials can be biased, inaccurate and unreliable [1]. While many institutions lack clear guidelines on the use of GAI tools, Bournemouth University and a few other universities in the UK have allowed their use to some extent, providing that students reference them properly. In addition, the UK government has published a comprehensive guide on the generative AI framework [12]. Just as internet usage is accepted, students can responsibly explore and use AI-based tools during their learning process. These tools can help students enhance or compare their inputs with tools' outputs or results. There are both advantages and disadvantages of using technologies in the context of learning or teaching the English language. However, teachers and students alike will face both opportunities and challenges when acquiring knowledge and skills through an AI-powered chatbot. This raises the question: Will teachers and educators be replaced by chatbots or robots? It is believed that the optimal approach for maximizing students' learning experience is through hybrid methods, which combine face-to-face interactions with teachers and the use of generative AI tools. GAI tools in language learning have become new reality, making it essential to test how EFL students perceive available tools.

This study was conducted in Bosnia and Herzegovina, where GAI tools and technologic advancements have been applied moderately compared to the EU countries. Due to rapid changes in education and technology, the research on EFL students' perceptions of GAI tools in language learning remains insufficient. Furthermore, understanding students' perceptions of GAI tools can provide valuable insights for policymakers, technology experts and researchers to enhance and improve the existing language learning tools. Since students are the primary recipients of GAI tools, obtaining their perceptions and views is crucial for the potential adoption of these technologies in English language teaching and learning in schools and universities in Bosnia and Herzegovina and beyond.

The study explores the following research questions:

- RQ1: What are university students' perceptions of using GAI tools in English language learning?
- RQ2: Is there any statistically significant difference in university students' perceptions of using GAI tools in English language learning based on students' gender?
- RQ3: Is there any statistically significant difference in university students' perceptions of using GAI tools in English language learning based on students' study program and the field of study?
- RQ4: What are the most commonly used GAI tools among university students?
- RQ5: What are university students' positive and negative perceptions of using GAI tools in English language learning?

## 2. Literature review

The emergence of modern technology and its prevailing usage by students and professors have resulted in greater research interest and studies on the relationship between technology, learning and teaching. These

studies have explored students' and teachers' awareness of technology, its usefulness, technical usage, and both positive and negative implications of technology in education. Research ranges from basic representation of GAI as tools and devices to the natural acquisition of language through interaction with interfaces. Rahman and Watanobe [13] argue that GAI should be seen more as a professional tutor that assists students in language learning by providing a range of language skills. Students often use GAI tools to improve their reading, writing, speaking, communication, research, analytical, critical and problem-solving skills. Similarly, Jeon and Lee [14] maintain that GAI serves as an assistant, supplying both students and teachers with valuable information and suggestions. Some studies specifically address the usefulness and technical application of technology in education. For instance, in curriculum planning, material selection and teaching methods, teachers use GAI to develop class activities, class materials, class exercises, readings and quizzes [15], [16]. Additionally, GAI provides students with opportunities for self-study and self-examination, allowing them to receive instant feedback outside class, independent of their teacher's oversight [17], [18]. This constant feedback helps students build confidence by identifying their linguistic mistakes and weaknesses, which can often be inhibited during class exposure and before their peers [9], [19].

Some studies go beyond mere technical usage of GAI tools, suggesting that GAI plays a role in directly motivating students, personalizing their language learning and facilitating direct human interactions. In this regard, Lund and Wang [20] maintain that GAI can comprehend and produce the natural language, provide explanations, solve problems, make creative suggestions and engage students and teachers in conversations. Kohnke et al. [18] argue that interaction and communication with GAI tools can improve students' pronunciation, making it comparable to that of a native speaker, which is an accomplishment that traditional language learning often struggles to achieve. Thus, GAI possesses the capacity to connect linguistically, cognitively and psychologically with both learners and teachers. Having a very high human interface capacity, GAI offers an interactive, engaging and productive language learning experience [19], [16]. Finally, GAI human-like interface strongly contributed to students' language learning and motivation in the study of the second language [17].

Shoufan's [21] work skillfully encompasses previous studies on the relationship between learning, teaching, language and GAI tools. In addition to reviewing earlier research, Shoufan examined students' experience and perceptions of using GAI tools, arguing that these factors strongly influence students' motivation, engagement and achievement. The study employed a 27-item questionnaire to assess computer science students' perceptions of GAI tools. The findings indicate that students perceive the use of GAI tools in education as positive, which led Shoufan to recommend their implementation in teaching and learning to both students and teachers.

Conversely, many studies highlight limitations and challenges associated with GAI tools. There is a prevailing opinion that GAI tools will never replace entirely formal modes of learning and teaching; rather, they should be regarded as supplementary and complementary to formal modes of learning and teaching. GAI tools may threaten academic integrity, as well as the integrity and originality of students' works, particularly concerning generated content and plagiarism [22], [23]. In addition, many people question GAI tools' ability to match human creativity. Although GAI tools can show critical thinking, clarity, precision, coherence and depth, very often they exhibit inaccuracies and biases, while many provide only raw information [19].

Studies on GAI tools are constantly evolving, which resulted in numerous gaps in literature. Since GAI tools are not formally incorporated learning and teaching in schools and universities, their occasional and ad hoc application fails to demonstrate their true usefulness and effectiveness. Although many studies acknowledge the role of GAI tools in enhancing self-learning, few have conducted comparative analyses of traditional learning versus personalized self-learning. Finally, there remains a gap in the literature regarding how policymakers, researchers, scientists and educators perceive the prospects of GAI tools within the legal and educational frameworks. There is a pressing need for research on the regulation of GAI tools usage in the education system.

## 3. Theoretical framework

Digital technologies have captured the character of contemporary cultures and societies. Albert Borgmann [24], in his seminal work, began exploring the relationship between technology and human life. He raised critical questions regarding the relationship between information and reality, such as: What is the nature of information? Where does information exist? How does information differ from knowledge? How does information reflect reality? How is information related to the arts, sciences and education?

These questions are essential, particularly given the concerns that virtual reality may undermine the actual reality. Thus, the challenge is not to reject digital technologies and information, but to connect their functionality to real-life contexts and practices. The availability of different digital technologies has expanded the ways in which people search for, interact with, and disseminate information. However, the information has not been properly contextualized, which resulted in the studies on digital-human interactions and interfaces. Borgmann [24] introduced the concept of the "device paradigm" to problematize the extent to which technology improves the quality of life. He focused on what technology really is and what technology can practically offer to people, relating it to automation, outcomes, commerce, labor, work, progress, democracy, etc. Moreover, he distinguished between "devices" and "things", where a device is merely an instrument, while a thing, from a sociological point of view, evolves within real socio-political and educational contexts. In this regard, digital-human interaction and interfaces shape technological manifestations and practices. These two processes are seen together and, as such, they project practical reality. For instance, in distance learning, it is essential to consider both the mode of interaction and human interface. Borgmann [25] criticized spending billions of dollars on educational hardware and software but very little on digital-human interaction and interface.

This research aims to explore students' perceptions of GAI tools, their usefulness, technical usage, and students' positive and negative attitudes towards GAI tools. Borgmann's theoretical model was applied to examine the way technology is changing and transforming learning and teaching. The advent of digital technology has dramatically altered the field of education, leading to the decline of classical and modern theories and approaches to learning and teaching. The digital technology revolution and evolution require a quick change, adaptation and practical experience in tackling learning and teaching. The digital world presents both challenges and opportunities for students and teachers. As a result of the digital information, teachers have transitioned into facilitators of learning and information-seeking.

Davis [26], [27] developed similar theory known as the Technological Acceptance Model (TAM). In his model, he harmonized information systems and technology acceptance behavior, particularly examining the relationship between cognitive and effective factors in users' technology application. He examined the willingness of individuals to accept and use innovative technology. The Technology Acceptance Model stipulates the following:

- a user's *attitude* and *behaviour* towards using a technology implies the degree of evaluative affect of an individual's association in using the target system in his/her learning or teaching;
- the perceived ease of *using* technology refers to the belief that utilizing a specific technology will be effortless and straightforward;
- a user's perceived *usefulness* implies the extent to which a person believes that using technology would enhance his/her learning or teaching performance.

The Technological Acceptance Model became an important instrument utilized by developers, practitioners and users of technology prior to the implementation process. Davis [26], [27] developed the model to test the relationship between external factors and actual system usage through perceptual surveys.

Due to a wide range of applications in different fields of study, the Technological Acceptance Model has undergone further development. Recent studies have introduced additional variables such as the subjective norm, image, job relevance, output quality, result demonstrability, experience, voluntariness, computer

anxiety, computer self-efficacy, perception of external control and computer playfulness. Shoufan [21] adapted this model to test the use of ChatGPT among students majoring in computer science. Along with the original variables proposed by Davis, Shoufan's model included variables such as requirements, interactions, impact on learning, long-term impact and affection. Shoufan also examined both positive and negative aspects of these five variables with regard to learning.

## 4. Research methods

Both quantitative and qualitative methods have been applied in the research. A survey questionnaire was adapted from Davis [26], [27] and Shoufan [21]. The instrument consisted of three parts: (1) general information; (2) the scale part; and (3) open-ended questions. The first part of the survey consisted of two questions about students' gender and study program. The scale part included 25 statements on 5-point Likert scale, ranging from strongly agree (5), agree (4), neutral (3), disagree (2) and strongly disagree (1). Data were analysed using the Statistical Package for the Social Sciences (SPSS) software. The results from the Cronbach's alpha test of reliability indicated a value of 0.768 for the 25 items of the questionnaire, confirming that the data were suitable for factor analysis. A Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and a Bartlett**'**s test of sphericity were conducted. The results of the KMO tests amounted to 0.861, while the Bartlett's test yielded statistically significant results ($p$<0.001). The instrument included five subscales, and the principal component analysis revealed that five components were extracted. The following dependent variables were determined: (1) students' awareness of the use of GAI tools, (2) the usefulness of GAI tools, (3) technical usage of GAI tools, (4) negative attitudes towards GAI tools, and (5) positive attitudes towards GAI tools. The third part of the survey consisted of three open-ended questions. Thematic analyses were conducted to examine the students' responses.

The research was conducted in December 2024 among students of International University of Sarajevo in Bosnia and Herzegovina where English is the medium of instruction and communication. The University comprises five faculties and twenty study programs. Prior to conducting the research, an approval was sought from and granted by the University's Ethical Council. The survey was distributed to students enrolled in different faculties and study programs via Google Forms. The two independent variables were students' gender and students' study field.

## 5. Results and discussion

The total number of 226 students completed the questionnaire (N=226), out of which 115 (50.9%) were male and 111 (49%) were female students. Out of these, 224 students provided responses regarding their study program. The responses showed that 121 (54%) participants were studying natural and technical sciences at the Faculty of Engineering and Natural Sciences. The Faculty of Engineering and Natural Sciences comprises the following study programs: Computer Sciences and Engineering, Software Engineering, Electrical and Electronics Engineering, Artificial intelligence and Data Engineering, Mechanical Engineering, Architecture, and Genetics and Bioengineering. On the other hand, 103 (46%) participants were studying humanities and social sciences at the Faculty of Arts and Social Sciences, the Faculty of Business and Administration and the Faculty of Education. These three faculties comprise the following study programs: Psychology, Visual Arts and Visual Communications Design, English Language and Literature, Media and Communications, Economics, Management, International Business and Finance, Political Science and International Relations, English Language and Literature Teaching and Turkish Language and Literature Teaching.

Mean values of students' answers were calculated for each dependent variable and the results were the following: (1) students' awareness of the use of GAI tools (M=4.19); (2) usefulness of GAI tools (M=3.27); (3) technical usage of GAI tools (M=3.67); (4) negative attitudes towards GAI tools (M=2.99); and (5) positive attitudes towards GAI tools (M=4.13).

The Mann-Whitney test was carried out to determine if there are statistically significant differences in the responses based on the independent variable of student gender and the five dependent variables. The test results indicated that there were no statistically significant differences between male and female students regarding the dependent variables. However, when individual items from the questionnaire were examined, a statistically significant difference was found with regard to Item 2: *I have Generative Artificial Intelligence (GAI) tools downloaded on my smartphone*. More male than female students agreed and strongly agreed with the statement, with the *p*-value lower than 0.05.

Table 1. Test results for Item 2 and variable Gender

**Ranks**

| | Gender | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Item 2 | Female | 111 | 102.91 | 11422.50 |
| | Male | 114 | 122.83 | 14002.50 |
| | Total | 225 | | |

| | Item 2 |
|---|---|
| Mann-Whitney U | 5206.500 |
| Wilcoxon W | 11422.500 |
| Z | -2.389 |
| Asymp. Sig. (2-tailed) | .017 |

The Mann-Whitney U test was conducted to determine whether there are statistically significant differences between the independent variable study field and the five dependent variables. The results indicated no statistically significant differences between students studying in the field of natural and technical sciences and students studying in the field of humanities and social sciences. On the other hand, when individual items of the questionnaire were analysed, statistically significant differences were found between three items and the variable study field: Item 16: *Students' use of Generative Artificial Intelligence (GAI) requires careful monitoring by professors*; Item 19: *Generative Artificial Intelligence can produce biased and inappropriate content*; and Item 21: *Artificial Intelligence is a threat to humankind*.

Table 2. Test results for Items 16, 19 and 21 and the variable Study field

**Ranks**

| | Faculty | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Item 16 | Natural and technical sciences | 114 | 100.25 | 11429.00 |
| | Humanities and social sciences | 101 | 116.74 | 11791.00 |
| | Total | 215 | | |
| Item 19 | Natural and technical sciences | 114 | 95.63 | 10901.50 |
| | Humanities and social sciences | 101 | 121.97 | 12318.50 |
| | Total | 215 | | |
| Item 21 | Natural and technical sciences | 115 | 98.29 | 11303.00 |
| | Humanities and social sciences | 100 | 119.17 | 11917.00 |
| | Total | 215 | | |

| | Item 16 | Item 19 | Item 21 |
|---|---|---|---|
| Mann-Whitney U | 4874.000 | 4346.500 | 4633.000 |
| Wilcoxon W | 11429.000 | 10901.500 | 11303.000 |
| Z | -1.994 | -3.213 | -2.529 |
| Asymp. Sig. (2-tailed) | .046 | .001 | .011 |

The results indicated statistically significant differences in how the students from the two study fields perceive items related to the negative attitude towards Generative Artificial Intelligence tools. Students in the

humanities and social sciences had higher mean ranks compared to those in the natural and technical sciences when considering negative attitudes towards GAI tools.

Additionally, we aimed to explore whether there were any statistically significant differences among the five dependent variables and students' study programs. The Kruskal-Wallis test was conducted and the results showed no statistically significant differences between these variables.

The final part of the questionnaire consisted of three open-ended questions. The first open-ended question invited students to list GAI tools that they use. A total of 187 (82.7%) students responded. Out of these, 10 (5.3%) students responded that they do not use any GAI tools, while 177 (94.7%) confirmed that they use GAI tools. Among the students who use GAI tools, 122 (65.3%) students noted that they use only one GAI tool, all of whom listed ChatGPT. Out of 39 (20.9%) students who noted that they use two different GAI tools, only two did not list ChatGPT. Nine students (4.8%) listed three GAI tools and 6 (3.2%) students listed more than three GAI tools. One student (0.5%) claimed to use all GAI tools. ChatGPT is the most frequently used GAI tool, listed by 175 (94%) students who answered this question.

Apart from ChatGPT, students also listed the following GAI tools more than once: Copilot, Gemini, Grammarly, QuillBot, Dall-E, Bing, Photo Math, Canva, Blackbox, Notion, Claude, Character.ai and GitHub. Among the GAI tools which were listed once are the following: Jungle, Study AI, Learn AI, Photo AI, Aria, Snapchat AI, Slidesgo, Gamma, BasedLabs.ai, Hugging Face, NVIDIA, AI Logo Maker, Julius AI, AI Therapist, Popai, AI Render, Feymann, HelloTalk, Symbolab, etc.

GAI tools used by the participants can be classified into the following categories: chatbots (ChatGPT, Gemini, Character.ai, Hugging Face, Snapchat AI), virtual assistants (Copilot, Aria, Notion), writing and grammar tools (Gramarly, QuillBot), image and video generating tools (Dall-E, Bing, Photo AI, BasedLabs.ai, Krea AI), learning tools (Claude, Jungle, Feymann, Popai, YouLearn AI, Study AI, Learn AI, Chegg), language learning tools (HelloTalk, Practice Your English AI), math learning tools (Photo Math, Symbolab), presentation tools (Slidesgo, Gamma), graphic design tools (Canva, AI Logo Maker), data management tools (Julius AI, NVIDIA), coding tools (Blackbox, GitHub), and psychology related tools (AI Therapist).

The second open-ended question asked students to describe their personal experience in using GAI tools. The total of 167 (74%) students answered this question. The thematic analysis of students' responses revealed that some had positive experiences with the use of GAI tools, some had negative experiences, while some had mixed experiences. Table 3 provides an overview of the main topics and examples of students' answers.

Table 3. Overview of students' experience in using GAI tools

| | **Subtopics** | **Example answers** |
|---|---|---|
| 1 | Positive experience | *- It is a valuable tool for enhancing my efficiency and creativity, helped me in learning by providing explanations, personalized study resources and simplifying complex topics.*<br>*- It is very easy to use, helpful, and has an answer to everything.*<br>*- It helped me a lot in learning English and other classes that I have.*<br>*- I absolutely love AI and its capabilities. It has made a huge difference in my life, helping me explore new ideas and gain deeper insights effortlessly. AI is not just a tool; it's a game-changer.* |
| 2 | Negative experience | *- I find it very limited in terms of contents, flow, contextualization and problem-solving. I just use it to double check my own knowledge on certain subjects.*<br>*- The one time I gave in and tried to use it for help, it did nothing.*<br>*- Even if it does help, in my opinion it makes us dumber.* |

| | Subtopics | Example answers |
|---|---|---|
| 3 | Mixed experience | *- I was at first against the usage of AI and didn't like when others use it, but lately I discovered how helpful it can actually be so I started using it when I need help and outlines, although I never make it to do my tasks completely.*<br>*- My personal experience with using generative artificial intelligence tools has been quite positive. I've used these tools for tasks like content creation, brainstorming ideas, and simplifying complex information. They've been particularly helpful in saving time and enhancing creativity by providing fresh perspectives. However, I also make sure to critically evaluate the outputs to ensure accuracy and relevance, as AI can sometimes produce errors or unintended results.*<br>*- I use it rarely, but when I do, I use it to help me with something, not to do something for me.*<br>*- Positive, but it can be confusing.*<br>*- Sometimes it is good, but also very frightening with the speed it is developing.* |

Students who had positive experiences emphasized that GAI tools assist them with learning, make learning easier, save time and effort when looking for answers to various questions. They noted that these tools enhanced their efficacy and creativity. Many students pointed out that GAI tools help them manage complex tasks, solve mathematical problems, summarise books and texts, learn foreign languages, converse in foreign languages, understand better subjects like philosophy and psychology. Some even indicated that GAI tools could help them with some emotional issues.

On the other hand, students who had negative experiences pointed out that GAI tools are not reliable and can give false information. They noted that copying things from GAI tools does not support genuine learning, as such outputs are easily recognizable, and it is unfair to researchers who spend months researching a topic. Additionally, students expressed concerns that reliance on GAI tools could lead to complacency, diminish critical thinking skills and make peoples less knowledgeable.

Many students expressed mixed views and experiences regarding using GAI tools, noting that, although they use them regularly and find them helpful for variety of purposes, they also notice inaccuracies and errors. They find GAI tools to be positive but also confusing. Some students pointed out that they are not sure how to use GAI tools properly, while others expressed concerns with the speed AI is developing.

The last question in the questionnaire was an open-ended question in which students were invited to share anything else they considered relevant for the topic. In total, 112 (49.6%) students answered this question. The thematic analysis of students' answers showed the three main subtopics: positive aspects of GAI tools, negative aspects of GAI tools and calls for actions regarding the use of GAI tools. Table 4 provides an overview of the main subtopics and examples of students' answers.

Table 4: Overview of students' additional comments

| | Subtopics | Example answers |
|---|---|---|
| 1 | Positive aspects of GAI tools | *- AI is an amazing technology. It is really useful, especially when I have no idea what will I do with my research. I ask ChatGPT to follow some steps, then it helps me to have an idea.*<br>*-It is really amazing for people with certain disabilities, making accessing stuff as easy as possible.* |
| 2 | Negative aspects of | *- It takes away the struggle in learning. For example, math: you can't just* |

| | Subtopics | Example answers |
|---|---|---|
| | GAI tools | *learn math; you need to struggle in order to gain a high enough level of understanding it to its core. So, AI can help but not as main source of knowledge.*<br>*- It should be used just as a helping tool, it is not always 100% accurate.*<br>*- It scares me that it can answer everything.* |
| 3 | Calls for actions regarding the use of GAI tools | *- AI tools in education require proper legal and educational framework, which should be developed by legal experts, IT experts and educators in general.*<br>*- The threat of AI does not come from the AI itself, but from people who will misuse it, especially if AI evolves to a terrifying extent, such as it being able to generate false, hyper realistic videos and images which can be used for unethical and illegal purposes.*<br>*- Students generally lack the knowledge to use the AI appropriately, so it is a skill that should probably be taught.*<br>*- AI could never replace humans in teaching due to their somewhat passive responses. Human to human contact is imperative in learning, in my opinion.* |

Students emphasized the positive aspects of GAI tools, highlighting their efficiency, safety in searching, speed, helpfulness and utility in generating ideas for assignments. One student emphasized the amazing assistance GAI tools provide to people with disabilities. However, majority of responses focused on the negative aspects of GAI tools. Students pointed out that, even though GAI tools are helpful, they are not always accurate, they also make students lazy and less confident in their own skills. Additionally, students expressed their concerns about the ethical aspects of using AI tools in some contexts, but also the threat of overreliance on AI which diminishes students' critical thinking skills, their independence and decision-making. Some students highlighted that, since everyone uses AI tools nowadays, they feel pressured to use them in order not to feel inferior to others. Students also believe that GAI tools are jeopardizing certain jobs and hobbies, for example, in the field of graphic design. Other students were quite categorical in declaring that AI was a mistake.

In terms of future prospects of AI, students called for certain actions regarding the use of AI, advocating for collaboration among legal experts, IT experts and educators. They noted that everyone needs to adapt to the changes that are taking place, emphasizing their need to learn more about the use of AI, but also professors managing AI tools and their use in teaching. They expressed their concerns about the potential of AI and the way it may be misused, calling for close control over AI tools. In addition, one student noted that the use of AI in teaching cannot be compared to the role of humans and human contact for students and their learning.

## 6. Conclusion

University students at IUS recognize the importance of GAI tools for learning in general and learning the English language in particular. They generally have positive perceptions of the use of GAI tools. More male than female students have GAI tools downloaded on their smartphones. More students in the field of natural and technical sciences maintain positive attitude towards GAI tools than students in the field of humanities and social sciences. ChatGPT is the most commonly used GAI tool among the university students at IUS, followed by Copilot, Gemini and Grammarly. Overall, the majority of students have positive attitudes towards GAI tools; they use them regularly and view them as valuable resources for their learning and university education. Some students expressed negative attitudes and concerns about the use of GAI tools, especially in relation to GAI tools' inaccuracies, misinformation and bias, ethical issues of using these tools and their

potential harmful impact on humans. Students pointed out that they need more education on how to use GAI tools adequately and efficiently. Students are calling for actions in regulating the use of GAI tools in education. All the stakeholders, including the governmental authorities, university boards and academic staff, should provide clear guidance about the use of GAI tools in education and university education, with considerations of ethical issues, misuse and risks associated with the use of GAI tools.

**Declaration of competing interest**

The author declares that they have no known financial or non-financial competing interests in any material discussed in this paper.

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