

STUDENTS' PERCEPTIONS OF CHATGPT'S USE IN HIGHER EDUCATION

PERCEZIONE DEGLI STUDENTI DI CHATGPT NEI CONTESTI UNIVERSITARI



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ABSTRACT

This contribution examines the use of ChatGPT in higher education as a teaching tool, focusing on the perceptions of university students. The scarcity of studies available in the literature motivated the selection of the 12 most recent and authoritative studies by conducting a literature review. The findings indicate a general positive view on the part of the students, some ethical concerns and, with respect to the disposition towards the tool, the presence of a possible cultural factor.

Il contributo esamina l'utilizzo di ChatGPT nell'istruzione superiore come strumento didattico, concentrandosi sulla percezione degli studenti universitari. La scarsità di studi disponibili in letteratura ha motivato la selezione dei 12 studi più recenti e autorevoli, effettuando una revisione della letteratura. Emerge, da parte degli studenti una generale visione positiva, alcune preoccupazioni etiche e, rispetto alla disposizione nei confronti dello strumento, la presenza di un possibile fattore culturale.

KEYWORDS

ChatGPT, student perception, higher education
ChatGPT, percezione degli studenti, università

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Introduction

The market debut of ChatGPT has inaugurated a novel paradigm in the domain of generative AI. It has introduced a sophisticated natural language processing system based on a machine learning model into the conversational AI landscape. ChatGPT is capable of simulating human conversations in a convincing and insightful manner, with the capacity to engage in fluent and realistic dialogues with users. (Kasneci et al., 2023). In contrast to traditional chatbots, which are often constrained by rigidity and repetition, ChatGPT offers a more natural and engaging conversational experience. ChatGPT is not a simple chatbot; it is a sophisticated artificial interlocutor that is capable of understanding and answering questions in an intelligent and creative manner.

The software was developed by OpenAI² and launched in November 2022. It reached one million users in just five days. As of March 2024, the number of monthly users of ChatGPT has exceeded 180.5 million.

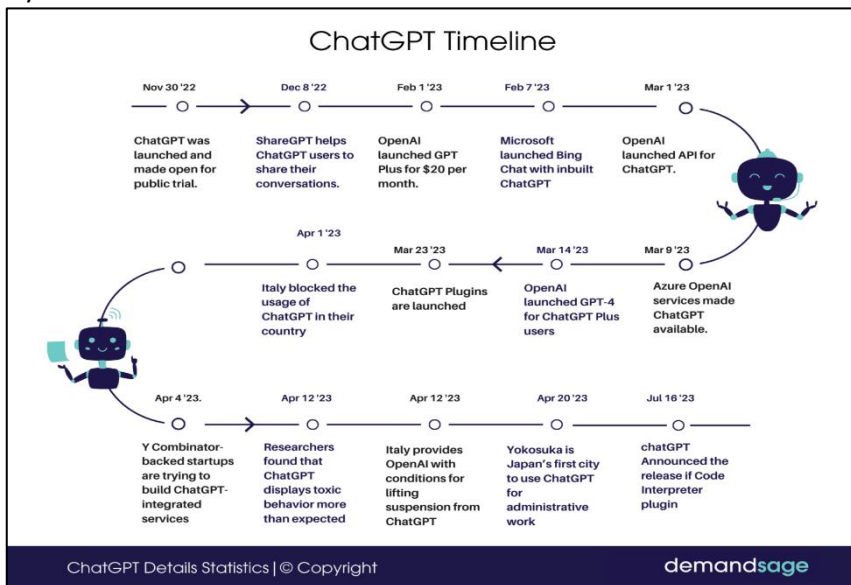


Figure 1 - The ChatGPT Timeline (Source: <https://www.demandsage.com/chatgpt-statistics/>)

ChatGPT is available in 82% of countries worldwide³, with both a free and a paid plan. The considerable impact of ChatGPT on a global scale is evidenced by the

² <https://openai.com/> accessed on 29/04/2024.

³ www.demandsage.com/chatgpt-statistics/ accessed on 29/04/2024.

15,026 scientific research results returned by Scopus between November 2022 and 20 April 2024, using the search string [ALL (chatgpt) AND PUBYEAR > 2022 AND PUBYEAR < 2024]. Similarly, 4,750 publications on the Web of Science Core Collection were identified.

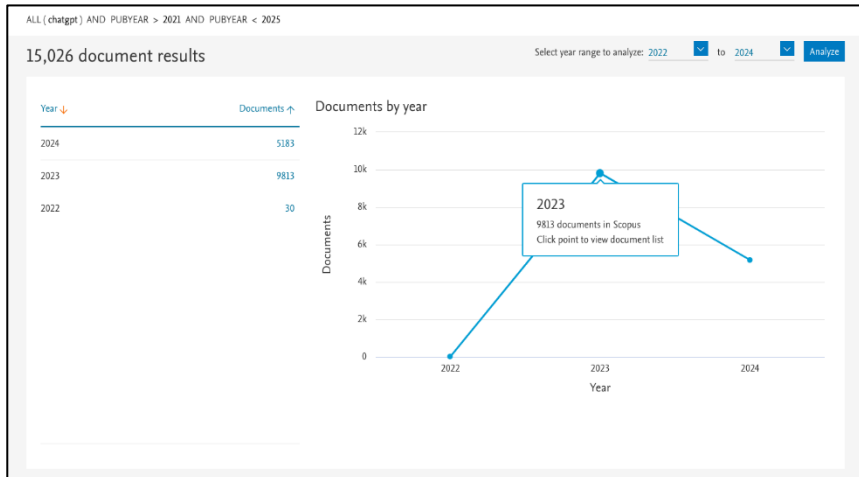


Figure 2 - The Scopus search result graph displays the number of results returned by the search query.

The advent of ChatGPT represents a pivotal advancement in the field of conversational artificial intelligence, heralding a new era of human-computer interaction. Its capacity to learn, adapt and generate realistic language renders it a versatile tool with a wide range of potential applications. By drawing on existing content, it produces new and original content. However, the source of the information produced cannot be traced, and the answer may not always be accurate. In such cases, we speak of 'hallucinations'.

ChatGPT is based on OpenAI's GPT-3 neural architecture, which has undergone further refinement to optimise its dialogue capabilities. The development of ChatGPT represents a significant advancement in the field of AI, particularly in the area of Natural Language Processing (NLP). ChatGPT's architecture is based on transformative neural networks (TNT), a type of deep learning model that has demonstrated exceptional capabilities in dealing with complex textual data. The model is trained on a vast corpus of text and code, enabling it to develop a profound comprehension of language and its intricacies. ChatGPT's capabilities are remarkable and continue to evolve. The system is capable of performing a wide range of linguistic tasks, including natural language understanding, coherent text generation, machine translation, answering questions, and much more (Bahrini et

al., 2023). Thanks to its continuous learning capability, ChatGPT is able to adapt to a variety of contexts and provide relevant and informative answers based on the context of the conversation.

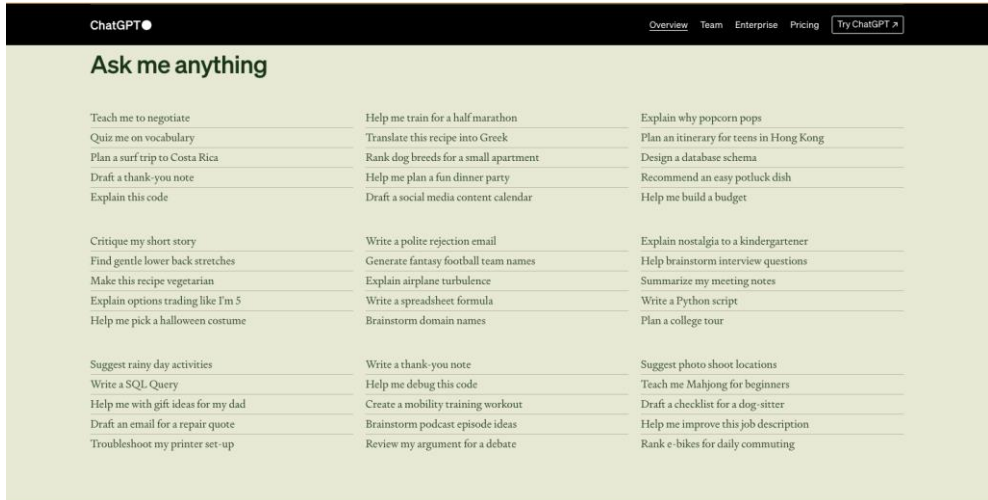


Figure 3 – “Ask me anything” source <https://openai.com/chatgpt>

In addition to its core functionality, ChatGPT has been augmented with control and supervision tools with the objective of ensuring safe and responsible interaction with users. This encompasses the implementation of mechanisms to identify and address inappropriate or harmful content, as well as to respect the privacy and security of user data.

ChatGPT's principal capabilities encompass realistic and consistent text generation, natural language understanding, the capacity to respond to open-ended queries, and a customisable conversation style.

The latest features, which are currently being rolled out for Plus and Enterprise users, include the ability to see, hear and talk. One can initiate a conversation using one's own voice, create images by simply describing them in chat while conversing with the app, or insert an image to demonstrate what one is talking about.

Due to its innovative capabilities, ChatGPT is finding application in multiple areas, including customer service, content generation, training and education, and the development of chatbots and intelligent virtual assistants.

1. ChatGPT in higher education

The advent of generative artificial intelligence systems, such as ChatGPT, has profoundly impacted the landscape of information acquisition and learning in the field of education. This has sparked considerable interest and debate.

The advent of generative AI systems has led to a significant disruption in the traditional role of higher education institutions in the transfer of knowledge and the development of skills. While the potential benefits of these AI systems are considerable, there are significant challenges that must be meticulously addressed to ensure that education remains pertinent and efficacious in the context of a rapidly evolving digital landscape (Walczak & Cellary, 2023).

ChatGPT has the potential to revolutionise the learning and teaching space (Kumar, Rao, Singhania, Verma, & Kheterpal, 2024).

The integration of ChatGPT in academic settings offers a number of potential benefits.

Firstly, the process of content creation can be streamlined through the use of ChatGPT, which enables educators to enhance their lessons with greater dynamism and engagement. By means of prompts, it is capable of creating effective explanations and examples, as well as analogies. As an interactive educational guide, it can act as an AI tutor (see Figure 4), providing support in understanding concepts, explaining ideas, asking questions to stimulate critical thinking, and offering hints and examples to help students better understand the topics covered.

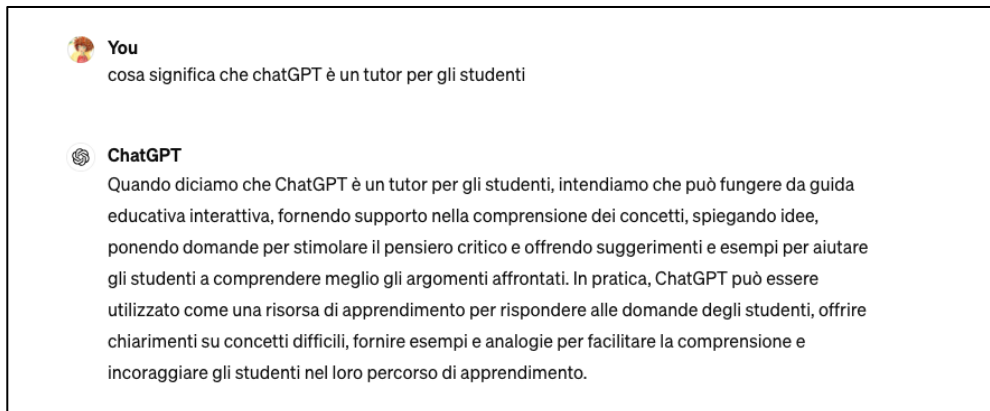


Figure 4 - Image of the authors

In practice, ChatGPT can be employed as a learning resource to respond to students' queries, elucidate challenging concepts, provide illustrative examples and

analogies to facilitate comprehension, and motivate students in their educational pursuits. It can be integrated into the creation of quizzes, tests, and lesson plans based on the curriculum materials, and it can assist in the generation of interactive educational content using information and concepts from the curriculum materials. The following is an example of a prompt submitted to ChatGPT by the authors, accompanied by the responses generated by the tool (Fig. 5).

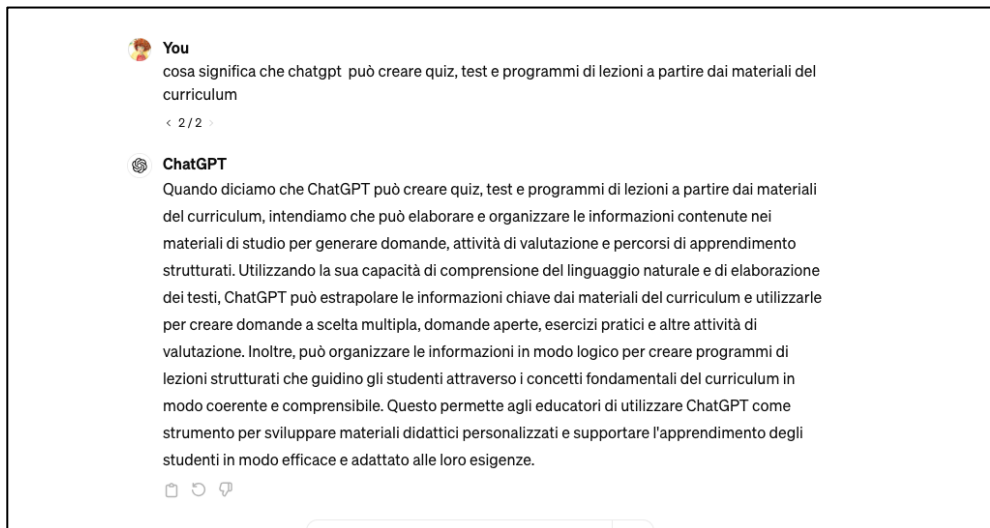


Figure 5 - Image of the authors

Generative AI can serve as a valuable adjunct to lecturers' ideas, offering assistance in translation, text simplification, and the rapid creation of examination materials. Furthermore, it is anticipated that the utilization of ChatGPT will facilitate the emergence of novel professions, such as the 'Prompt Engineer', an expert in formulating precise questions to enhance the quality of responses. In light of the recent "artificial intelligence paradigm shift" (Lee et al., 2024), it is imperative that curriculum content and pedagogical practices in universities be reviewed and updated.

However, the implementation of ChatGPT in academic settings presents a number of challenges. Firstly, it has the potential to impact traditional pedagogies by shifting the emphasis from knowledge transfer to knowledge processing, and from disciplinary to interdisciplinary learning. This prompts educators to rethink assessment, given that GenAI applications could swiftly complete tasks such as essays, reports, research proposals and lesson plans for students (Chiu, 2004).

While generative AI is perceived as an opportunity by academics, it is also regarded as a potential threat (Kumar, Rao, Singhania, Verma, & Kheterpal, 2024). It is important to note that generative AI can produce errors or unexpected results, which may require careful supervision to ensure the accuracy of responses. A number of ethical considerations arise in relation to the use of ChatGPT. These include the possibility of copyright infringement due to plagiarism issues, the lack of guaranteed reliability and accuracy, concerns about academic integrity, and privacy issues.

Given the potential for generative AI to be widely used in formal academic settings, it is recommended that institutions develop policies and provide formal guidance on the use of generative AI. The implementation of generative AI (GenAI) technologies should be marked by transparency, accuracy and privacy to promote trust and mitigate potential risks (Chan & Hu, 2023).

The necessity for appropriate regulation to ensure the responsible and beneficial use of this technology is underscored by concerns about its management and the associated potential risks.

2. Methods

As previously stated, the research was driven by the remarkable success of the AI tool over the past year. The methodology has been influenced by the limited breadth of the literature (Strzelecki, 2023a; Strzelecki, 2023b), which does not allow for a more extensive systematic review.

A literature review was conducted using the six steps of the CLAS-WE method presented by Efron and Ravid (2019). The chosen survey topic focused on university students' perceptions of the use of ChatGPT, which was summarised in the research question 'How do university students perceive the AI ChatGPT tool?'

The search for literature sources was conducted on the Web of Science and Scopus search engines using the following code: A search was conducted on the 'Web of Science' and 'Scopus' search engines using the code 'ChatGPT AND university AND student'. The search yielded 41 articles, which were further refined through the application of appropriate exclusion criteria. These included temporal limitations (2023-2024), linguistic criteria (English), significance (only articles published in band A journals were considered, in accordance with ANVUR guidelines), and a focus on the content of the titles.

- Analysing and synthesising the data – the reading of the obtained articles allowed us to further refine the sources by eliminating those contributions that

did not answer the research question and, therefore, did not address the students' perceptions. This further operation enabled the retrieval of the 12 papers on which this contribution is based and Table. In this study, the locations of the study and the salient features obtained are highlighted.

- Write-editing: The final two stages of the process enabled the six-handed writing of this contribution, which brought out the results of the study of the 12 contributions (see Results).

Authors	Year	Location of the study	Distinctive features
Chan C. K. Y., Hu W.	2023	Hong Kong	<ul style="list-style-type: none"> - Perception⁴ university students - Advantages and disadvantages
Nawaz S.S., et all.	2023	Sri Lanka	<ul style="list-style-type: none"> - Acceptance of students - Using UTAUT2 - Advantages and disadvantages - Positive results
Ngo T.T.A.	2023	Vietnam	<ul style="list-style-type: none"> - ChatGPT student perception - Vision⁵ positive ChatGPT - Disadvantages - Possible solutions
Singh H. et alla.	2023	United Kingdom	<ul style="list-style-type: none"> - Sceptical view of students - Guidelines from universities
Strzelecki A.	2023	Poland	<ul style="list-style-type: none"> - Opinion of university students - Using UTAUT2 - Positive view ChatGPT
Strzelecki A.	2023	Poland	<ul style="list-style-type: none"> - Student behaviour towards ChatGPT - Using UTAUT2 - disadvantages and advantages - comfort students with the programme
Strzelecki A., ElArabawy S.	2023	Poland Egypt	<ul style="list-style-type: none"> - Disadvantages to advantages - Using UTAUT - Students' behaviour towards ChatGPT
Abdaljaleel M. et all.	2024	Arab countries	<ul style="list-style-type: none"> - Students' attitudes to using ChatGPT - TAME-ChatGPT - Advantages and disadvantages

⁴ Perception, in the contribution, is understood as "the process by which we acquire information about the world around us using our five senses" so they are representations of experiences that have not yet created structured knowledge (<https://iep.utm.edu/epis-per/#H1>). On the other hand, the term 'vision' refers to representations that give coherence to experiences (Cfr. Armstrong, 1973; Goldman, 1986).

The studies analysed revealed not only the significance that students attach to the tool, but also a positive idea about its possible use in education.

Chiu T.K.F	2024	Eastern Cultural Region	<ul style="list-style-type: none"> - How ChatGPT influences high education - Positive vision
Essel H.B et all	2024	Ghana	<ul style="list-style-type: none"> - Advantages and disadvantages - Influence on thinking (critical and reflective) - Positive results
Habib S., Vodel T., Anli X., Thorne E..	2024	USA	<ul style="list-style-type: none"> - ChatGPT's impact on students' creativity - AUT use - Vision to support the creative process - Beware of substitution
Silva C.A.G.d. et all.	2024	Brazil	<ul style="list-style-type: none"> - Use for programming challenges and problems - Advantages and disadvantages - Positive view ChatGPT

Table 1 summary of the 12 contributions

3. Results

A total of 41 articles were identified through a search of various online databases. However, only 12 were deemed to be the most significant in answering the research question. This reduction in the literature serves to highlight the fact that, despite the considerable success of the artificial intelligence tool in question, there are still few studies in the literature that take students' perceptions of the topic in question into consideration (Strzelecki, 2023a).

A review of the papers and a tabulation of the data yielded the following results. It was possible to derive and summarise some recurring themes, which are presented in tabular form in Table 2 and in graphical form in Graphic 1.

- The Unified Theory of Acceptance and Use of Technology (UTAUT) is a theoretical model that has been used to analyse students' behavioural intention towards ChatGPT (Strzelecki, 2023a, p. 1; cf. Strzelecki, 2023b). The theoretical model was employed to analyse the behavioural intention of students towards ChatGPT.
- A positive view was expressed by students in general and specifically in the context of the teaching environment.
- The study also examined student behaviour and perception of ChatGPT.
- Critical thinking: This refers to studies that have analysed the impact of the tool on students' critical and reflective thinking.
- The utilization of ChatGPT as an educational tool: the application of ChatGPT in educational and university settings, with a particular focus on its use as an educational tool.

- Disadvantages: The disadvantages of the tool are evident both in its intrinsic characteristics and in its application to educational contexts.
- Socio-cultural aspects: the social and cultural factors that influence students in their choice and use of the tool.

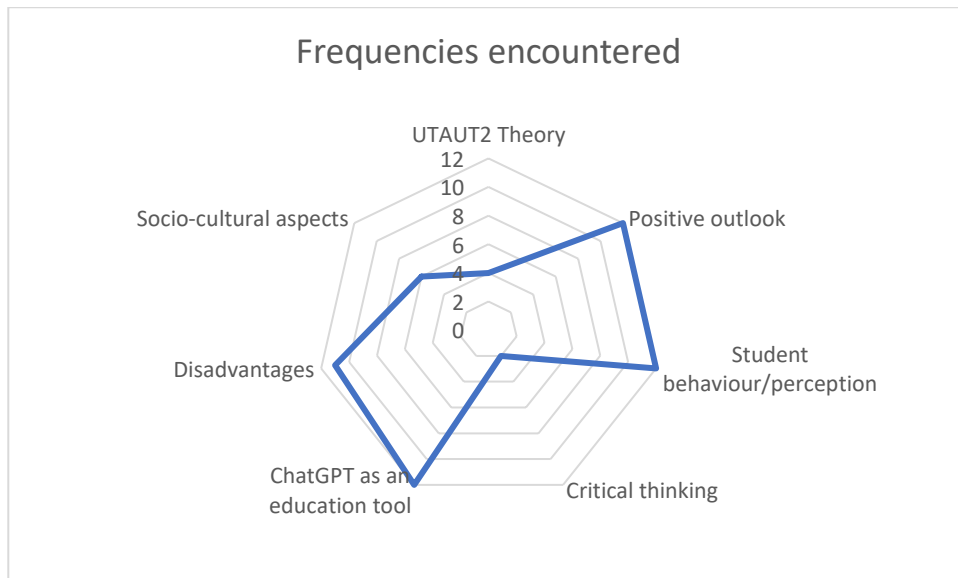
These are explored in depth, including:

- A general positive view from students on the instrument.
- The utilization of ChatGPT as a pedagogical instrument.
- Concerns have been raised regarding the ethical implications of utilizing the instrument and the identified disadvantages.
- The instrument may influence critical and reflective thinking.
- It is possible that socio-cultural aspects may influence the use of the instrument.

Article	UTAUT2 Theory	Positive view	Student behaviour/perception	Critical thinking	ChatGPT as an education tool	Disadvantages	Socio-cultural aspects
Abdaljaleel et al. (2024)		x	x		x	x	x
Chan, Hu (2023)		x	x		x	x	
Chiu (2024)		x	x		x	x	
Da Silva, Ramos, de Moraes, dos Santos (2024)		x	x		x	x	
Essel, Vlachopoulos, Essuman, Amankwa (2024)		x	x	x	x	x	
Habib, Vogel, Anli, Thorne (2024)		x	x	x	x	x	
Sanjeetha et al. (2023)	x	x	x		x		x
Singh, Tayarani, Yaqoob (2023)		x	x		x	x	x
Strzelecki (2023a)	x	x	x		x	x	x
Strzelecki (2023b)	x	x	x		x	x	x

Strzelecki, ElArabawy (2023)	x	x	x		x	x	x
Thi Thuy An Ngo (2023)		x	x		x	x	

Table 2 Frequencies encountered



Graph 1 Frequencies encountered

Furthermore, the research is enhanced by the international scope of the studies considered. It is notable that, although no limitations or criteria have been imposed on the country of origin, the pool of sources appears to encompass almost all continents (Europe, Africa, Asia and America). This allows for a broader perspective to be taken in answering the research question.

3.1 The instrument is perceived positively by the majority of students

The studies analyzed present a positive view of the ChatGPT tool by students. Indeed, the tool was widely accepted by the participants of the studies in all the articles analyzed.

This trend is strongly influenced by the immediate availability of the tool (online and 24/7), anonymous support, ease of use (Chan, Hu, 2023, p. 8; Strzelecki, 2023a; Ngo, 2023; Silva et al, 2024; Abdaljaleel et al., In addition, the speed of idea generation (Habib et al., 2024; Abdaljaleel et al., 2024) and intuitive interaction in

prevailing languages (Strzelecki, ElArabawy, 2023; Singh et al., 2023) have been identified as key factors.

The students interviewed by Singh et al. (2023) also considered the aspect of speed to be crucial. They stated that it is important to save time on trivial tasks and spend more time on complicated tasks that require more enhanced skills.

No particular influence on the 'price value' was identified (Strzelecki, 2023b, p. 13). It should be noted that the use of ChatGPT is currently free of charge during the tool's research preview. Although the ChatGPT plus version with the latest GPT-4 language model is available for \$20 per month, the difference in the ChatGPT's use, powered by the GPT-3.5 version, for everyday student tasks is unlikely to be noticeable.

However, should the offer of free use cease in the future, it could become a significant factor (Strzelecki, 2023b).

In contrast, Nawaz et al. (2003) posit that feelings of happiness and pleasure serve as a significant motivator for the utilization of these technologies. technologies⁶. Indeed, the characteristics of innovation, sophisticated functionality, and conversational ability exert a strong influence over students who are attracted to it and eager to use it (consistent with the studies on self-efficacy conducted by Andrès-Sanchèz and Genè-Albesa (2003).

The results also demonstrated that a positive attitude is strongly correlated with the frequency of use and knowledge of the instrument (Chan, Hu, 2023, p. 8; Nawaz et al., 2023, p. 19).

Indeed, habit has a significant impact on students' behavioural intention (Strzelecki, 2023a; Singh et al., 2023; Strzelecki, 2023b). It positively influences the acceptance and use of learning management systems (Zwain, 2019).

Additionally, Strzelecki identified the construct "performance expectancy" as the second most significant predictor of students' intention to use the tool, following habit. Conversely, the decision of students to utilize the tool is contingent upon their awareness of its added value ('perceived usefulness'⁷ Abdaljaleel et al., 2024, p. 8) and its utility in the learning process (Nawaz et al., 2023).

Furthermore, the positive perception of students is influenced by their expectations of the future of ChatGPT. Indeed, there is a shared awareness of the need to integrate the tool into the learning system (see 2.2). This is evidenced by the following statements: "We need to learn with ChatGPT for social science" and

⁶ Strzelecki (2023a) calls it 'hedonic motivation' (p. 10).

⁷ The perceived usefulness in the cited study refers to 'enhancing efficiency in university assignments and duties' (p. 8).

"In the future, we need to work with ChatGPT." It would be beneficial to gain an understanding of how to work with ChatGPT (Chiu, 2024, p. 5).

3.2 Using ChatGPT as a teaching tool

A review of the literature reveals that students express a preference for integrating the tool into their own learning (Nawaz et al., 2023) and future careers through the utilization of the tool for the acquisition of unique insights and personalized feedback⁸ (Chan, Hu, 2023, p. 8).

A significant proportion of students utilize the tool⁹ "to gather information for their courses and write an article or piece of work" (Chiu, 2004, p. 5; Ngo, 2023), or as a search engine (in a wide range of languages¹⁰) and study support (Ngo, 2023). In support of this, statements such as "ChatGPT makes me lazy to think" and "ChatGPT can give answers quickly" received little acceptance (Ngo, 2023, p. 8).

In contrast, other students were aware of the tool but had never used it due to the ban imposed by some universities (Essel et al., 2024, p. 8), Consequently, their use was limited "similarly to Google search engine" or "as a live Wikipedia".

In addition, students interviewed by Ngo (2023) also highlighted "helping save time", "providing information in different fields", "providing individualized tutoring and feedback to students" and "helping students improve their learning and retention" as advantages (p. 12). Conversely, with regard to the learning aspect, several significant elements emerged concerning the following: possibility of use for the explanation of theories, improvement and criticism of writing and development of apps and software (Ngo, 2023, p. 12). In contrast, the sample identified by Essel et al. (2024) emphasized the personalized learning that can be enjoyed through the use of ChatGPT. It allowed sampling methods to be understood "at their own pace and in a less intimidating mode" (Essel et al., 2024, p. 9).

In the study by Silva et al. (2024), the benefits of ChatGPT are identified in terms of "clarifying doubts, providing educational examples, and assisting in identifying programming errors" (p. 15).

⁸ The feedback received from artificial intelligence has a significant impact on students' self-learning (Allen, McNamara, 2015; Roscoe et al., 2015, Snow et al., 2015).

⁹ Others would be in favour of doing so if their universities allowed it (Chiu, 2024).

¹⁰ According to Abdaljaleel et al. (2024) ChatGPT could be a useful tool for non-native English speakers for language learning "process, thereby promoting inclusivity and equity in higher education" (p. 8).

The students interviewed by Chan and Hu (2023) also perceived ChatGPT as a valuable tool for "personalized and immediate learning support" (tutoring and presentation of activities tailored to the students), "writing and brainstorming support" (generating ideas and insights) and "research and analysis support", "visual and audio multi-media support", "administrative support" (handling bureaucratic issues) (p. 9 - 10).

However, students are aware that integrating the tool into teaching requires "solid disciplinary knowledge" (Chiu, 2024, p. 6).

This is necessary in order to benefit from the use of the tool while avoiding being overly receptive (Chiu, 2024). Furthermore, Habib et al. (2024) emphasize the importance of developing new competencies in order to be able to use the tool profitably and develop creative thinking (see 2.5).

Another advantage identified in the studies with regard to the introduction of ChatGPT into education is the interdisciplinary view that it would offer for problem-solving (Chiu, 2024).

The study by Singh et al. (2023) revealed that a considerable proportion of students were already familiar with the tool, yet had never utilized it within an educational context. These findings can be attributed to the absence of university policy on the utilization of ChatGPT. It can be surmised that students would have been reluctant to utilize a prohibited tool, thereby risking long-term impairment. Additionally, the authors propose an alternative explanation due to a lack of knowledge regarding the methods of use.

In a similar vein, respondents proffered potential applications of ChatGPT in education, including code generation, application development, report writing, further clarification of uncertainties, and preparation for evaluation (Singh et al., 2023).

Furthermore, Chiu and colleagues emphasize how ChatGPT would encourage students to summarize rather than recall facts and knowledge, and call for this to be taken into account when integrating the tool into the teaching environment.

Despite acknowledging the advantages of the tool, the majority of students in Silva et al.'s (2024) study expressed reservations about the potential for ChatGPT to replace teachers. Instead, they suggested that it could serve a supportive role.

3.3 Perceived disadvantages of the instrument

A further analysis of the articles revealed a number of concerns and disadvantages identified by the students in using the tool¹¹.

In Chiu (2024), the participants expressed concern about the potential impact of ChatGPT on their performance in examinations. At the same time, the teachers highlighted the difficulties in assessing the work produced by students¹².

In Ngo's study (2023), students demonstrated a superior level of awareness regarding the challenges associated with the instrument, identifying the following as the primary obstacles: "unable to examine quality and reliability of sources", "unable to replace words and use idioms wisely", and "inability to measure the value of difficult mathematical formulas" (Ngo, 2023, p. 13). Conversely, "producing responses weakens after several paragraphs" (Ngo, 2023, p. 13). Concerns encountered thus relate to the accuracy and credibility of sources (Essel et al., 2024; Chan, Hu, 2023), formulating the correct questions and understanding ChatGPT's answers (sometimes difficult to interpret) (Ngo, 2023).

In the study by Silva et al. (2024), students also identified limitations in the tool 'with real-time visual and auditory learning methods' (p. 15).

Another concern among students is the potential impact of ChatGPT on their own learning (Silva et al., 2024). There is a perception that it could lead to a reliance on it (Chan, Hu, 2023) (cf. 2.5), with the risk of affecting their skills (Singh et al., 2023). "students believe that over-dependency is the main threat with using ChatGPT. [...] there is always the possibility that the students may use it for trivial tasks and may become over-dependent on the tool' (p. 13).

These concerns are also echoed by Abdaljaleel et al. (2024) "possible unreliability of the generated content, risk of plagiarism, security concerns, risk of violating academic policies, and privacy issues when using ChatGPT5" (p. 8).

In the study by Singh et al. (2023), students demonstrated a concern for the development of language skills and reflective thinking. The authors posit that human-human interaction is of fundamental importance and that it is not possible to substitute for it in the development of successful learning.

In addition to concerns regarding plagiarism and the fabrication of sources, ethical concerns become apparent in Chan and Hu (2023). In this study, we read doubts concerning:

- privacy: some students were concerned that ChatGPT could collect personal information 'AI technologies are too strong so that they can obtain our private information easily' (p. 11).

¹¹ No correlations were found between the concerns raised by students and their knowledge of GenAI technologies (Chan, Hu, 2023).

¹² The teachers were not able to understand the originality of the tasks handed in.

- Possibility of being replaced at work: "I will probably lose my job in the future due to the advent of ChatGPT" (p. 12).
- Human values: The interviews with students revealed concerns regarding the potential for injustice and social inequality. Some participants perceived ChatGPT as a potential instrument that could exacerbate socioeconomic disparities, disadvantaging those who are unable to utilize it.

Despite these findings, not all students were aware of the risks and ethical issues involved in using the tool (Chiu, 2024; Chan, Hu, 2023). Some students expressed a lack of confidence in its use (Silva et al., 2024).

Although numerous disadvantages were identified, the students expressed a desire to continue utilizing the tool, suggesting potential solutions to address the disadvantages and enhance its functionality (Ngo, 2023; Abdaljaleel et al., 2024).

3.4 Potential impact of social factors on the utilization of the instrument

The social aspect, as evidenced by empirical studies, is a significant determinant of students' selection and utilization of digital tools.

This aspect is identified by Nawaz et al. (2023, p. 18) and Strzelecki, ElArabawy (2023), who found that students are more likely to view ChatGPT as a useful tool for their learning when they obtain support and encouragement from their peers and teachers. (18) and again, the results suggest that acceptance and usage of ChatGPT are influenced by external figures, such as instructors, peers and administrators, underlining their vital role in promoting and encouraging students' adoption and use of AI chat systems (Strzelecki, ElArabawy, 2023, p. 15).

The provision of social support, including encouragement and suggestions from peers and teachers, can enhance students' sense of security and certainty, thereby increasing their intention to use it.

The influence of socio-demographic factors was also identified in the study by Abdaljaleel et al. (2024), although this was not investigated further.

In his 2023a article, Strzelecki presents ChatGPT as a recent technology and notes that social pressure related to its use has not yet been created. However, with time, social influence may become more relevant.

A number of studies (Strzelecki, ElArabawy, 2023) have also attempted to investigate the factors 'gender' and 'level of study', but have yielded inconclusive results. Further research will be necessary to ascertain the influence of these factors on the utilisation of AI.

The authors also identified a possible cultural influence in students' perceptions (Strzelecki, ElArabawy, 2023; Singh et al. 2023¹³), in fact, belonging to more liberal or conservative countries could direct students in their use and perception of ChatGPT. This aspect was also identified by Abdaljaleel et al. (2024) who found a higher usage for Egyptian students.

3.5 Critical thinking

Some studies have highlighted concerns regarding the potential impact of ChatGPT on students' critical thinking (Habib et al., 2024; Essel et al., 2024).

The findings of Ngo (2023) indicate that the use of the instrument as a consultant may offer a potential solution to this issue, as it avoids the direct copying of answers and the development of a strong dependency.

The study by Habib and colleagues (2024) Conversely, the study by Habib et al. (2024) identified positive outcomes for fluency and divergent thinking through collaboration with the tool. It can be argued that the utilization of artificial intelligence would enable students to process a more diverse array of creative ideas, thereby prompting them to think in unconventional ways¹⁴.

These findings were also observed in the study by Essel et al. (2024), which demonstrated that utilizing ChatGPT for in-class tasks effectively enhanced students' critical thinking abilities. This was attributed to the dialogue with the interface, which prompts students to engage in critical thinking.

Notwithstanding these encouraging outcomes, the research landscape in this area remains limited and requires further investigation to fully capture its complexity (Habib et al., 2024). Moreover, it was highlighted that although ChatGPT offers valuable assistance in developing critical thinking skills, it may only partially replicate the nuances and complexity of human creativity, which is shaped by socio-cultural factors and personal experiences (Essel et al., 2024, p. 10).

¹³ The authors found no differences between African and Asian students but admit 'it may not be the case for a balanced representation of international students' (p. 8).

¹⁴ Although to a lesser extent, some students experienced difficulties with using the tool stating "With using ChatGTP, it's way easier to brainstorm because the computer literally does everything for you", "The use of the AI was nice, but in some ways feels like taking 'the easy way out'", "It felt as though the bot was giving me an easy way out and not allowing me to think on my own as much", "AI came up with those ideas so easily, and I felt bad that I didn't come up with more ideas myself" (Habib et All., 2024, p.4; Silva et All., 2024). Others, however, emphasized the 'practicality' of the answers given by the tool, which turned out to be uncreative and unoriginal (plagiarism risk).

4. Discussion

A comprehensive analysis of the 12 articles reveals a complex and multifaceted picture that stimulates reflection and poses clear challenges for the future.

Firstly, it is essential to conduct in-depth studies to identify the potential threats underlying the instrument (Chiu, 2024; Habib et al., 2024; Strzelecki, 2023a; see 2.3).

Secondly, the development of digital skills, including AI, data, computational, algorithmic, digital, and media literacy (Chiu, 2024, p. 5), should be fostered in the future in line with global initiatives. It is imperative that this mode of educational action considers the adaptability of students, who will have to change their approach to technology (Chiu, 2024).

It is therefore necessary to acknowledge the role of technology in educational environments and to identify appropriate ways of integrating it into the curriculum to support students' creativity in a healthy and collaborative manner, rather than in a detrimental and reliant relationship with AI.

It is evident that the introduction and use of the tool in education inevitably causes a rethinking of pedagogy. This is evidenced by the shift in emphasis from transfer of knowledge to processing of knowledge, and from disciplinary learning to interdisciplinary learning (Chiu, 2024, p. 6; Habib et al., 2024).

In fact, the tool could be used as a mediator and regulator of the level of teaching difficulty to create more personalized learning that can meet everyone's needs (Essel et al., 2024).

Furthermore, the students concurred that the development of mixed (digital and face-to-face) classrooms and environments in the future is essential, with the integration of ChatGPT to foster the development of interpersonal communication skills in digital environments (Chiu, 2024).

It is, however, of the utmost importance to adopt a balanced outlook, neither denying nor exalting technology, when considering the enhancement of existing teaching methods through programming language (Silva et al., 2024; Singh et al., 2023).

According to studies, the ethical concerns raised for the study of the tool could be overcome through the development of policies and guidelines in universities, which would promote academic integrity (Ngo, 2023; Silva et al., 2024; Singh et al., 2023). It is therefore recommended that universities take action to prevent academic misuse, including the identification of actions to be taken in the event of plagiarism (Singh et al., 2023).

It is noteworthy that the evaluation domain is worthy of further examination. The difficulty that teachers have in determining the originality of students' work is

analyzed from a novel perspective by students. Rather than viewing this as a disadvantage of the instrument, they perceive it as an opportunity to re-evaluate school assessment from a more formative and student-centered perspective (Chiu, 2024; Singh et al., 2023).

As previously outlined, in addition to the area of evaluation, the students identified potential solutions to address the disadvantages encountered (see 2.3). These included verifying the answers provided by the IA through scientific articles and assigning it an advisory (and not direct copying) role.

In general, the concerns raised by students could be overcome through appropriate training in the use of the tools. This could enhance students' comfort and diminish present reservations and prejudices (Nawaz et al., 2023).

Finally, the study and the interesting cultural aspects that emerged are presented as a basis for the design of a follow-up survey, with the structuring of a questionnaire to be administered to a transcontinental population of students. This will facilitate a more comprehensive understanding of the subject matter from a wider perspective.

In light of the recent nature of the research, further studies and insights will be required, taking into account the variability of technology and ongoing discoveries. It is pertinent to mention that ChatGPT does not have adaptive capabilities and is not tailored for academic use, indicating a need for more research on its potential role in learning environments (Strzelecki, 2023b, p. 14).

Finally, it is important to acknowledge the limitations of the studies analyzed in the scoping review. This will help to contextualize the present contribution and inform future research. The studies included in the review had a number of limitations. These included a lack of diversity in the samples, difficulties in generalizing the findings and the need to analyze the practical uses of the instrument.

Conclusions

The advent of ChatGPT marked a pivotal moment in the evolution of generative artificial intelligence, prompting a re-evaluation of the field. Its accessibility and ease of use have made it a technology available to a very wide audience, thereby accelerating innovation and the spread of new language models. The advent of ChatGPT has prompted research into new areas and accelerated the development of innovative applications in various fields. The advent of ChatGPT has not been without consequence, however. It has prompted a broad debate on the ethical implications of generative AI, leading to greater awareness and responsibility in the development and use of these technologies. Of particular interest is the

introduction of ChatGPT in the educational field.

The findings of this literature review indicate a generally positive view of ChatGPT as a tool in general, despite the concerns highlighted. Furthermore, there is a positive view of its application in the educational context.

It is evident that an analysis of students' (users') perceptions is a crucial element for the tool's success, particularly in the educational context (Chan, Hu, 2023). It is evident that a comprehensive understanding of the perceptions, concerns and applications of the tool among academics, educators and policy makers is essential for the successful integration of AI into educational contexts.

The positive reception of the instrument highlights the necessity for further study and analysis by those involved in training.

Those with a responsibility for education and training students must recognize the significant impact of such tools on the learning experience. Both university lecturers and tutors, who are responsible for the curriculum, as well as those responsible for formulating usage policies, are involved in this process.

The former should address the study of the tool in order to gain insight into its advantages and disadvantages and to ascertain its potential inclusion in their teaching and in support of student learning. It is therefore of the utmost importance to gain an understanding of these tools in order to define their impact and effects on learning and teaching, as well as to identify targeted pedagogical strategies that carefully integrate AI resources into teaching practice. Furthermore, educators, families and students must participate in workshops to gain familiarity with GenAI technologies.

In particular, course leaders should engage in both the training of teachers and the organization of appropriate staff, including technologists, tutors, and learning analytics experts (Perla, Vinci, 2022)

The latter should be responsible for drafting usage policies or guidelines that strike a balance between the appropriate and responsible adoption of ChatGPT and similar tools. These policies should aim to avoid both indiscriminate use and outright rejection.

The pervasive impact of generative AI will undoubtedly play an important role in shaping the higher education of the near future. It is incumbent upon humanity to utilize this technology in a responsible and conscious manner, addressing the ethical and social issues that will undoubtedly arise. It will be a significant challenge for the educational sector to shape the citizens of tomorrow.

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