

ARTIFICIAL INTELLIGENCE AND EDUCATION: OPPORTUNITY OR RISK? OPINION FROM THE CONVERSATIONAL AI CHATBOTS

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Abstract

Artificial Intelligence (AI) in education has undergone significant developments in recent years. Tools like ChatGPT are currently used in educational contexts, either as an assistant to teachers generating didactic material, or as a virtual tutor for students, to answer questions and facilitate collaboration. The purpose of this paper is to investigate the benefits and risks of the use of AIs based on the opinion of conversational AI chatbots themselves. Three interviews were held with conversational AIs: ChatGPT, Google Gemini and LLaMA. Twenty categories were identified from the four dimensions developed in the interviews, with 713 citations in total. The Learning Resources, Advantages and Learning Benefits categories stand out. ChatGPT is prominent in terms of the resources available for learning and teaching, as well as the benefits that teachers and students find in its application, awareness of the risks and challenges they face in education in order to make appropriate use of large language models (LLMs). On the other hand, Gemini stands out in identifying the use and strategies of appropriate use and the ethical considerations that educational agents must consider regarding the use of AI in education. Finally, LLaMA response stands out for the resources, benefits, advantages and challenges for learning. In conclusion, the responses generated by the models indicate the possibilities of their use in education and the risks and challenges faced in this field. Therefore, conversational AIs have great potential and impact in education, but it must be up to teachers and students to promote ethical and appropriate use for the experience to be positive and beneficial in education.

Keywords – Artificial intelligence, Education, Chatbots, Benefits, Advantages.

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1. Introduction

Conversational AI tools are increasingly present in the educational context. Their use has been expanding in recent years as an assistant in teaching, whether in the creation of teaching materials, the evaluation and monitoring of students or as a virtual tutor, to facilitate the resolution of questions or collaboration between peers (Lo, 2023). AIs are machines that perform human-like cognitive functions such as perception, reasoning, interaction or learning (Rai et al., 2019). This technology aims to develop systems

that think and act like humans, with the ability to achieve their goals (Akgun & Greenshow, 2022). Thanks to recent breakthroughs in natural language processing (NLP), it has become a useful tool for students due to its great potential in the learning process and its availability. Moreover, it has lately acquired interest when analysing the positive impact of the use of these AI applications on student engagement, academic performance and satisfaction with the learning achieved. (Huang et al., 2023; Lai et al., 2023; Zheng et al., 2023).

Thus, AIs are playing an increasingly important role in the educational field due to their proven effectiveness as personalised learning systems (Khosravi et al., 2022). Artificial intelligence in education appears in a multitude of scenarios within the teaching-learning process, where it can provide personalised instruction and feedback for both teachers and students. For example (Chen et al., 2020): a) in evaluation of the student learning process, as it allows for adaptation of the teaching method with a personalised learning approach; b) in the marking and evaluation of assignments and exams, as they have image recognition, computer vision and machine learning prediction; c) in personalised smart learning, by having data mining or Bayesian inference, an intelligent teaching system and learning analytics; d) in smart schooling, by having facial recognition, voice recognition and virtual labs; and e) in remote and mobile education, such as customised virtual assistance and real-time analytics.

Nowadays, one of the technologies commonly used in the education area are conversational bots (Chatbots), which use NLP. They have several potential benefits for students, such as motivation, interest, improved academic performance and enhanced communication, as well as for teachers, improving their teaching skills, preparing better assignments and helping with marking (Adiguzel et al., 2023). One AI currently used in the educational context is ChatGPT (OpenAI, 2022), which also offers several benefits to students (motivation, academic performance, 21st century skills and non-cognitive aspects), as well as for teachers (teaching skills, work efficiency and attitude towards AI in education) (Chiu et al., 2023). Many examples have emerged in the last two years of experiments carried out in the education scope using AI in the learning process (Boubker, 2024; Ngo, 2023; Rad et al., 2024). ChatGPT and other AIs allow students to self-regulate their pace and learning style, which can positively influence their satisfaction and performance expectations (Cai et al., 2024). For example, in higher education, AI develops benefits in providing interactive and immersive learning experiences, increasing student engagement and motivation by adapting to their pace of learning (Denecke et al., 2023; Pham et al., 2023). As evidenced by students' and teachers' experiences, AI can help analyse large datasets of valuable information to inform content design and by automating routine administrative tasks, thus freeing up teachers' time to focus on teaching, tutoring and supporting students (Denecke et al., 2023).

However, while AIs have proven to be effective in the education context, they are not intrinsically positive, but must also take into account the potential dangers that education faces with their use. For, as Williamson (2024) points out, in recent years it has been assumed that AIs will inevitably transform the future of education for the better, but this is not necessarily the case. Like the screen vs. paper debate currently taking place worldwide, following the announcement by the Swedish Ministry of Education of the move to reintroduce paper-based reading (Göteborgs-Posten., 2023, cited in Díaz et al., 2024). Many authors point out the potential dangers of AI technology, especially in education (Baidoo-anu & Ansah, 2023; Díaz et al., 2024). For example, Sweeney (2023) identifies academic dishonesty, defined as a deceitful or unfair act intended to produce a more desirable outcome in an exam, paper, homework assignment or other learning assessment (Zhao et al., 2022). More sophisticated chatbots use algorithms and predictive text to create new content in response to questions posted by users. And these results can be used to compile credible-looking academic writing that may be undetectable even by anti-plagiarism software (Sweeney, 2023). Thus, chatbots trained on large datasets can provide results that appear credible or provide citations from untruthful sources, but risk being misleading or incorrect because there is no human accuracy check (Ali, 2023; Delouya, 2022). Moreover, other disadvantages are also observed in the use of AI in education (Baidoo-anu & Ansha, 2023), such as:

- Lack of human interaction: Generative AI models are not able to provide the same level of human interaction as a teacher or tutor, which is a disadvantage, as bonding is not possible.
- Limited understanding: Generative AI models rely on statistical patterns present in the data they are trained on and do not really understand concepts that help learners learn, a disadvantage in providing explanations and feedback tailored to individual needs.
- Bias in training data sets: generative AI models are only as good as the data they are trained on. If biased, the model will also be from the very beginning.
- Lack of creativity: Generative AI models can only generate answers based on patterns in the data presented during training, limiting the creativity and originality of their responses.
- Data dependency: Generative AI models are trained on large data sets, making them highly dependent not only on data quantity but also its quality - if not sufficient and relevant, performance can be suboptimal.
- Lack of context understanding: Generative AI models usually lack the ability to understand context and situation, which can contribute to inappropriate or irrelevant responses.
- Limited ability to personalise learning: Generative AI models can provide general and assisted feedback, but may not be able to personalise learning to meet individual students' needs.
- Privacy: There are concerns about privacy and data security when using generative AI models.

Given this context, will conversational AIs such as ChatGPT, Gemini or LLaMA be able to identify advantages and disadvantages of their use in education? To find an answer, this study analyses responses from these three conversational AIs chatbots, in their free version, to investigate their own vision of their use in education. Contributing to the understanding on how information from the educational field is processed by the AI models, their biases about their use, inferred by the models. And stating the current limitations of their use despite the possible positive contributions they can offer to both students and teachers.

Therefore, the following aims are proposed: a) identify categories based on the proposed dimensions and analyse the frequency of each of them in general and in terms of conversational AIs; b) analyse the possible benefits of AI use in education and their impact on the learning process of students and as support for teaching; and, c) analyse possible risks of AI use in education and their negative impact in relation to the challenges facing education and the ethical conditions of such use.

2. Methodology

2.1. Conversational AI Chatbots

Interviews were conducted with three conversational AIs in their free version. The conversational AIs used were: ChatGPT, Google Gemini and LLaMA (Large Language Model Application).

2.2. Data Collection Instrument

For the present study, an unstructured interview, by allowing for a more spontaneous response, by allowing the narrative to be explored in greater depth (Zhang & Wildemuth, 2009), was developed to gather information from the AIs in order to find out their *opinion* on the potentials and risks of their use in education. The instrument was divided into four dimensions (see Table 1): 1) Reasons for the use of AIs in education; 2) Benefits of AIs in education; 3) Risks of AIs in education; and 4) Challenges in the use of AIs in education.

The interviews were conducted on the same day for each of the conversational AIs in June of 2025. The interactions took place in a single session in order to review the development of that interaction. However, the prompts listed in Table 1 were kept unchanged, with the aim of maintaining the interaction with the three AIs in the same way.

Dimensions	Questions
Reasons for the use of AI in education	What can AI be used for in education?
	What resources do you offer to facilitate the teaching-learning process?
	Why do you think your resources should be used in education?
Benefits of AI in education	Could you list the benefits of the resources you offer in education?
	Why do you consider these resources to be positive?
Risks of AI in education	Could you list the risks of the resources you offer in education?
	Why do you consider these resources to be negative?
Challenges in the use of AI in Education	Can you list the challenges faced by those using these resources in education?
	Why do you think this is the case?

Table 1. List of dimensions and questions asked of conversational AIs

2.3. Design and Analysis Stages

The study design was qualitative. The use of this methodology allows for the construction of theoretical propositions based on the description of identified categories (Quecedo & Castaño, 2002), setting out from the opinions of the AIs on their potential and risks as an educational tool. For the data analysis, the process based on the Grounded Theory proposed by Corbin and Strauss (2014) was followed. This provides three main aspects: 1) the description of the phenomena analysed; 2) conceptual and relational organisation that determines the identification of categories, based on the previously identified dimensions; and 3) theorisation based on a logical, systematic and explanatory scheme (Bonilla & López, 2016).

The analysis process was developed in three phases carried out by the first author:

Phase 1. Holding the interviews. The responses of the three AIs were collected and an initial reading was carried out.

Phase 2. Data reduction. A second reading of the responses was carried out and focused, axial and theoretical (selective) coding were identified. The coding process described by Williams and Moser (2019) enables the iteration of codes, based on continuous review and data reduction, to ensure they remain focused on the objectives. The data reduction was carried out in three steps: 1) identifying the dimension like an open-coded as it provides data subcoding; 2) axial coding refines, organises and classifies these emerging themes; and, 3) selective coding continues the axial coding although at a higher level of abstraction enabling the redefinition of the subsequent categories that give meaning to the topic under analysis.

Phase 3. Categorisation process. In a third reading of the AI responses, 20 categories were identified from the selective codes. The content of the interviews was analysed using ATLAS.Ti v24 software.

3. Results

3.1. Categories and General Occurrence by Conversational AIs

To meet the first objective, the categories were identified and their occurrence was established both in general and in terms of each of the conversational AIs interviewed. Table 2 presents the four dimensions, axial coding and categories obtained from each of them with a total of 713 citations, followed by examples for each category. It can be stated that the most featured categories, with more than 80 citations, are Resources for learning, Advantages and Benefits for learning. Specifically, for each of the dimensions, it is observed that in the Motives dimension, the category with the highest presence is Resources for learning. With regard to the Benefits dimension, the most recurrent category is Benefits for learning. In the case of the Risks dimension, the category with the highest presence is Potential risks. Finally, in the Challenges dimension, the most recurrent category is Challenges for learning.

Dimension (cod.open)	Axial coding	Select coding	Category	Example	Citations
Reasons for the use of AI in education (Reasons)	RecDoc RecAlu RecAdm RecGral MotivUso	UtiIA	AI usefulness for education	“Gemini, an AI model developed by Google, offers great potential to transform education in various aspects” (Gemini)	52
		RecDoc	Teaching resources	“Creating Teaching Materials: Lesson Plans: Helps in developing detailed lesson plans with objectives, activities and assessment methods” (ChatGPT)	32
		RecAp	Learning resources	“As a large language model, I can offer a variety of resources to facilitate the teaching-learning process for different educational levels” (Gemini)	82
		RecAd	Additional resources	“Continuous update: I am a continuous learning model, which means that I am constantly learning and improving my skills” (Gemini)	35
		RazUso	Reasons for its use	“I believe that my resources in education can be beneficial in several aspects. Here are some reasons why you should use my resources in education” (LLaMA)	36
		Vent	Advantages	“Advantages for Students: immediate information access” (ChatGPT)	81
Benefits of AI in education (Benefits)	PotPos UsoAd	BenDoc	Teacher benefits	“Save time on lesson preparation: help in creating lesson plans, teaching materials and assessments” (ChatGPT)	16
		BenAp	Benefits for learning	“Improve motivation and engagement: The resources I offer, such as interactive activities and assignments, can increase students’ motivation and engagement with learning.” (LLaMA)	86
		BenAd	Additional benefits	“ChatGPT resources in education offer a wide range of benefits that improve the quality, accessibility and efficiency of the teaching-learning process, adapting them to students’, teachers’ and educational institutions’ needs.” (ChatGPT)	14
		UsoAd	Proper AI use	“The implementation of these resources must be done in a responsible and ethical manner, with appropriate supervision and guidance from teachers and education professionals.” (Gemini)	8
		EstUso	Appropriate use strategies	“It is important to continually monitor and evaluate LLM use in the classroom to identify potential problems and make necessary adjustments to optimise its positive impact on learning.” (Gemini)	23

Dimension (cod.open)	Axial coding	Select coding	Category	Example	Citations
Risks of AI in education (Risks)	RiesUso PotNeg UsoInad	RiePot	Potential risks	“Although resources offered by ChatGPT for education have many benefits, there are also several potential risks that should be considered.” (ChatGPT)	51
		ConseRie	Consequences arising from risks	“Overreliance on technology can lead to a decrease in problem-solving and critical thinking skills.” (LLaMA)	23
		UsoInap	Inappropriate AI uses	“It is important to clarify that I do not consider these resources to be inherently negative, but rather that their negative potential lies in inappropriate use or use without due consideration.” (Gemini)	6
		ConsEt	Ethical considerations	“Ethical AI use: the use of Artificial Intelligence in education raises ethical questions about equity, transparency and control over content and automated decisions.” (ChatGPT)	13
		ImpNeg	Negative impact	“Teachers’ devaluation: the perception that technological tools can replace teachers can devalue the fundamental role they play in students’ education, emotional and social development” (ChatGPT)	20
Challenges in the use of AI in Education (Challenges)	RetDoc RecAlu RecGral	TeaChall	Teaching challenges	“Lack of experience and skills in using technology can be a barrier for educators, which can limit their ability to integrate online educational resources into the classroom.” (LLaMA)	35
		LeChall	Learning challenges	“Lack of social interaction and online information overload can lead to students feeling overwhelmed and unmotivated, which can negatively impact their learning experience.” (LLaMA)	82
		EtChall	Ethical challenges	“Transparency and equity in AI use: Ensuring that the use of artificial intelligence is equitable and transparent is a challenge, as there are concerns about equity, transparency and bias in algorithms.” (ChatGPT)	8
		GeChall	General challenges	“LLM technology is still under development and may not always be completely reliable or accurate.” (Gemini)	10
Total citations					713

Table 2. Dimensions, axial codes, categories (selective coding), examples and number of citations per category and overall

Likewise, for each of the conversational AIs interviewed, occurrence of the categories was observed, as shown in Table 3. It is worth noting that ChatGPT's responses focus more on explaining the benefits of AI and the resources available to teachers. Above all, however, it stands out from the other two AI systems in terms of the benefits it lists for its use in learning. However, in the case of LLaMA, when it mentions resources, it only focuses on those for learning, without mentioning teaching or additional resources. In addition, it does not cite any Teacher benefits in the use of AI in education, nor does it mention challenges or ethical considerations. Furthermore, it can be stated that ChatGPT goes deeper into the resources it offers in education, whether for learning, teaching or additional resources. Furthermore, there is a clear difference in risk identification; we can see that ChatGPT has been trained more comprehensively in this area than the other two AIs analysed. LLaMA highlights the resources and benefits for learning, the advantages of using AI in education and the challenges for learning. Finally, Gemini focuses on the appropriate use, usage strategies and ethical considerations faced by educational stakeholders in the use of AI in education.

Dimension	Category	ChatGPT	Gemini	LLaMA
Reasons	AI usefulness for education	26	16	10
	Teaching resources	20	12	-
	Learning resources	25	25	32
	Additional resources	31	4	-
	Reasons for its use	18	8	10
	Advantages	23	26	32
Benefits	Teacher benefits	9	7	-
	Benefits for learning	28	18	40
	Additional benefits	9	4	1
	Proper AI use	2	5	1
	Appropriate use strategies	5	18	-
Risks	Potential risks	19	13	19
	Consequences arising from risks	11	4	8
	Inappropriate AI uses	1	1	4
	Ethical considerations	5	8	-
	Negative impact	16	1	3
Challenges	Teaching challenges	20	12	3
	Learning challenges	25	25	32
	Ethical challenges	5	3	-
	General challenges	6	3	1
Total		304	213	196

Table 3. Distribution of citations in each of the categories for each conversational AI and in total

3.2. Benefits of the Use of Conversational AI in Education and its Positive Impact

In response to the second objective, an analysis of the benefits that conversational AIs answers identify about their use in education was carried out. To this end, a network of codes was created to show the relationship observed in terms of the potential benefits and impact on students (see Figure 1). It can be seen how AIs identify a great utility in their use, such as the generation of educational content and materials, translating texts and encouraging autonomous or collaborative learning. AIs offer a 'wide range of applications that can transform education, making it more personalised, engaging, accessible and effective' (Gemini). These reasons are directly related to the advantages offered in the teaching-learning process. As indicated by the AIs, in education they can 'analyse texts, images and interactive content to create personalised educational experiences' (Gemini), which allows adaptation to any material, regardless of its complexity and even to the learning styles of students. Moreover, according to the conversational AIs, 'they provide clear and detailed explanations of difficult concepts in various subjects such as

mathematics, science and history, etc.’, directly linked to the advantages offered by the use of AIs in education, such as ‘helping to improve learning efficiency’ (LLaMA) or 24/7 availability, which ‘allows students to access information and support at any time, removing barriers of time and space and favouring continuous learning’ (ChatGPT). These advantages are directly linked to the multiple resources they offer in education, such as resources for teachers in the development of teaching materials, like lesson plans creation, as AI ‘assists in the development of detailed lesson plans, including objectives, activities and assessments’ (ChatGPT). In addition, they offer learning resources such as personalised tutorials by providing detailed explanations of ‘complex concepts, answering questions and offering additional support during the learning process’ (Gemini), or even additional resources by offering access to an extensive database of information with continuous update and learning, as AIs have ‘resources and tools that are continuously updated with the latest best practices and knowledge’ (ChatGPT).



Figure 1. Network of interrelated codes of the usefulness of AI and its benefits for use in education

Considering the ability of AIs to offer an abundance of resources that can help both students and teachers in the teaching-learning process as a utility for their use, it is observed that it is directly related to the reasons for the use of AIs in education. For their ability to personalise content, to provide an unlimited amount of information with unlimited access, to be flexible, innovative, to promote knowledge retention and skills development or the possibility of collaborating with peers or experts. Meanwhile, AI offers ‘a personalised learning experience for each student, tailoring content, activities and feedback to their individual needs, learning styles and paces’ (Gemini). Likewise, the use of AI ‘can foster greater integration of technology in the classroom, preparing students for an increasingly digital and technological world’ (ChatGPT).

These reasons thus illustrate the multiple benefits of using conversational AIs in education. For example, teaching benefits such as: 1) saving time in class preparation, as they provide resources such as teaching materials and assessments; 2) improving teaching quality, by making pedagogical suggestions and additional educational resources to enrich teaching; 3) efficient assessment and feedback, as they automatically generate tests and rubrics, facilitating the evaluation process; 4) development of educational resources, by providing examples, exercises and activities adaptable to different educational levels; and 5) training and professional development, giving access to materials and resources for continuous training and professional development. These benefits therefore ‘enrich the teaching-learning process and provide opportunities to explore different topics and perspectives’ (Gemini). Regarding the learning benefits, it is noted that AIs: 1) enable students to reach their full potential and develop their talents; 2) promote increased motivation and engagement in learning; 3) foster independence and self-confidence; 4) ensure equal information access opportunities and academic success; 5) promote social skills development and prepare students for real-world teamwork; and 6) significantly contribute to improving the quality of teaching and learning overall. In other words, AIs are beneficial for learning, as they encourage students to stay engaged and focused on learning ‘to facilitate the teaching-learning process’ (LLaMA), such as ‘applying what they have learned and developing creative and critical skills’ (LLaMA). Finally, the reasons for using AI in education relate directly to additional benefits to the educational process. As an aid to improve the quality of education globally, with the capacity to adapt and update itself continuously, it is

geared towards educational innovation, fostering creativity and critical thinking. Conversational AI in education offers a wide range of benefits that improve the quality, accessibility and efficiency of the teaching-learning process, adapting to the students, teachers and educational institution's needs.

They also propose the empowerment of the teacher's role as a positive impact, as the digital resources they offer in education allow the teacher to spend less time preparing the lessons and focus on other more important tasks such as planning, interaction with students and peers or assessment. This is linked to teachers' ability to prepare assessment by making use of AIs, as it saves time, promoting fast and accurate assessment through the automatic generation of tests and rubrics that can be used effectively in their subjects. Another impact highlighted by conversational AIs is the promotion of collaboration and teamwork, as it allows students to work together, developing social skills and preparing them for teamwork in the real world. This impact is seen in a completely positive light, as at no point do they raise any doubts or dangers that teachers, students or the education system may be facing. Only Gemini, without explicitly asking about other conditions, identifies that these potentials and benefits require knowledge in use and strategies to be applied appropriately. For example, it states that 'while Gemini is a powerful tool, its effective use requires a proper understanding of its capabilities and limitations on the part of teachers and students'. Furthermore, it adds, 'it must be used in a responsible and ethical manner, ensuring accuracy of the content generated and promoting a conscious use of AI in the educational environment'.

3.3. Potential Risks of AI and Challenges in Education

To respond to the third objective of this study, an analysis was carried out of the main risks that teachers and students face when making use of AIs, as perceived by AIs themselves.

To this end, a network of codes was developed that shows the relationship that conversational AIs observe concerning their potential risks and impact in terms of identifying the challenges facing education today (see Figure 2).

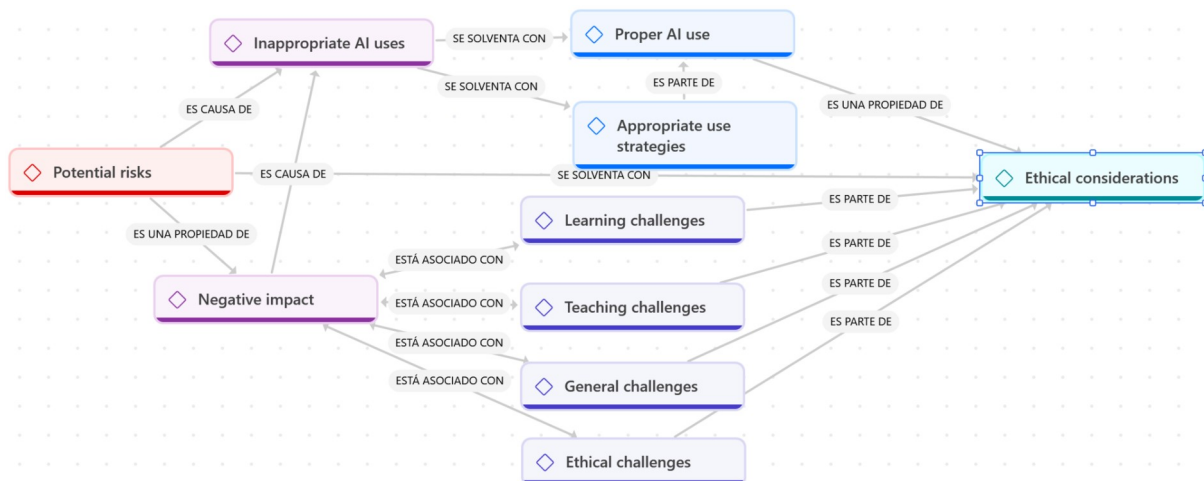


Figure 2. Network of interrelated codes of potential risks, misuse and negative impact, regarding challenges, strategies for use and ethical considerations

As shown in Figure 2, conversational AIs identify potential risks in the use of such technologies in education. For example, limited access to some resources due to Internet access itself, excessive dependence on technology, lack of supervision, inequity in access, privacy loss, unverified or inaccurate content, security risks, algorithmic biases, superficiality of learning, social interaction limitations or lack of personalisation in educational resources that are adapted to the students' needs. These are some of the risks that AIs themselves point out from their use, as the AIs mention that 'availability and access to LLMs

and digital educational resources may be uneven across different schools, regions or countries, which may exacerbate existing educational gaps' (Gemini). These potential risks can be caused by inappropriate uses of AI and have a negative impact on its potential educational use.

Concerning inappropriate uses, the AIs themselves mention great potential in their resources for education. However, they identify they are constantly learning and developing, for as Gemini itself states: 'my answers are based on information and data that I have been trained on and I am always working to improve my ability to provide accurate and useful information'. Noting that the resources they offer are not inherently negative, but that inappropriate uses can lead to risks if no ethical considerations or precautions are taken into account, 'it is important to remember that I am under development and that my answers should not be taken as a substitute for human judgement or experience' (Gemini). Moreover, AIs allude throughout to the following reasons to be respondents that inappropriate use is a potential risk: a) when online access to resources is not properly monitored, this can lead to exposure to inappropriate or dangerous content; b) if unverified information is present in educational resources, it can lead to learning of inaccurate or false concepts; and c) if technology is not used responsibly, students may lose important skills like reading or writing. Thus, the AIs identify that 'considering these resources as negative is based on the possible adverse impacts they can have on education if they are not used in an appropriate and balanced way' (ChatGPT). To achieve this appropriate and balanced use, the AIs identify a series of strategies that should be taken into consideration when using technology in education. Knowing how to integrate the resources effectively into teaching methods, checking information sources, supervising students' use of the AIs, using the tools with caution and knowing their limitations, teacher and student training, careful resources selection, monitoring, communication, transparency and ethical approach, etc. AIs identify their use as effective, accessible and attractive with a lot of potential, but to take advantage of these benefits 'it must be used responsibly and ethically, ensuring the accuracy of the content generated and promoting a conscious use of AI in the educational environment' (Gemini).

Considering the negative impact AIs themselves observe on their educational use, such as: 1) too much reliance on tools to solve problems and questions and becoming technology dependent; 2) giving up on searching for and evaluating critical information; 3) relying on information that could be incorrect or outdated; 4) loss of privacy and information security; 5) access to inappropriate or incorrect information or content; 6) devaluation of the teaching role; 7) reduced face-to-face social interaction; and 8) digital divide in technology access and use. These are some of the negative impacts observed by the AIs themselves in their educational use. For, as the AIs themselves indicate, 'the ease of obtaining quick answers can lead to superficial learning, where students do not delve deeper into the topics or develop a profound and solid understanding' (ChatGPT). However, to mitigate this negative impact, there are challenges that have to be faced in order to take advantage of AI's full potential in education. These include challenges for learning such as the development of dependence on technologies, critical evaluation of information, unequal or lack of access to technology and lack of digital skills, etc. For, in learning, students must make sure that the information can be trusted and develop their full potential, which constitutes a great challenge, because as identified in LLaMA, 'the amount of information available online can be overwhelming, which can make it difficult for students to find resources that are accurate and reliable'.

Regarding teaching challenges, a teacher's lack of experience and skills can be an obstacle to AI use. Likewise, the resistance to using it in the classroom; these two elements are important when coupled with the technological complexity itself, since it requires a certain technical knowledge level and computer skills, as well as pedagogical skills to know how to effectively and appropriately integrate it in the classroom, a great challenge for teachers. In this sense, "mastering the use of LLMs and digital educational resources may require a significant learning curve, which entails additional time and effort for teachers. This can be an obstacle for some educators with busy schedules or little capacity for ongoing training." (Gemini). Similarly, the AIs identified challenges in general such as constant updating, taking into account the rapid evolution of AI and constant adaptation to technological changes, as "the rapid evolution of technology means that educational institutions must continually adapt to new developments and tools,

which can be costly and laborious” (ChatGPT). Cost issues associated with online educational devices and resources acquisition and maintenance are also identified, in that “the costs associated with the acquisition and maintenance of online educational devices and resources can be a significant hurdle for students and educators, especially for those with financial constraints” (LLaMA). Finally, ethical challenges such as privacy and security issues, with difficulties in assessing the quality and veracity of resources. For, “the use of LLMs in education presents ethical questions related to transparency, accountability and the potential impact on the social and cognitive development of students” (Gemini). Ethical challenges are also seen in transparency and fairness in the use of AIs or in determining liability, as “establishing who is responsible for the information provided by ChatGPT, especially if it leads to misunderstandings or serious errors, is an ethical and legal challenge” (ChatGPT).

In conclusion, these challenges derived from the impact and inappropriate use of AI, as well as the risks faced by LLM users, can be overcome by having a clear ethical and legal framework to which both teachers and students must refer. Knowing how to make proper use, with a clear ethical and legal framework, promotes the full utilisation of the AI resources available. Fairness, transparency and control over automated content and decisions, identification of those responsible for the information, or “clearly knowing the potential impact on the social and cognitive development of students” (Gemini), are necessary and vital considerations to achieve positive impact. Thus, we see how conversational AIs are clearly aware of the risks faced by students and teachers and what must be the necessary elements for their potential to be harnessed. Above all, to reduce the possible consequences of negative impact, either: 1) overreliance on students to solve problems, without developing their own critical thinking and problem-solving skills; 2) loss of answer-seeking skills and their evaluation; 3) reliance on erroneous or biased information; 4) lack of continuous updating, which may lead to presenting outdated data; 5) widening of the digital divide in access to and use of LLMs and in the education system itself; 6) superficiality of learning by not delving deeper into topics or developing a deep understanding; 7) decrease in students’ intrinsic motivation to research and learn on their own. These are some of the potential consequences observed from the conversational AIs themselves, and it is essential that the users acquire digital and technical skills and are guided by ethical codes and good practices to reduce the risks and potential consequences of a negative impact.

4. Discussion

The objectives of the present study were to analyse the benefits of the use of AI in education and its impact on the teaching-learning process, as well as to analyse the risks and negative impacts. To conduct the analysis, three unstructured interviews were held with LLMs, namely ChatGPT, Gemini and LLaMA, in their free versions. The underlying dimensions and categories provide a rich picture of conversational AIs’ view of both their positive and negative impact on use in education. They are also a palpable demonstration that LLMs are trained to identify their own advantages and disadvantages, analysing the ability to assist in education, supporting both teachers and students in the teaching-learning process,

Regarding the first objective, there is a significant presence of the reasons for using AIs in education and the benefits for learning, and, to a lesser extent, the risks associated with the use of AIs and the challenges faced in the learning process. This helps to understand that these generative AI models have been trained to identify the benefits over the risks of their use in education. That is, they are prepared to identify the benefits provided by interactive and immersive learning experiences, such as indicating increased engagement, motivation of students and being able to adapt to different learning paces in the classroom (Denecke et al., 2023; Pham et al., 2023). However, although their training is focused on identifying the motives and benefits of using AIs in education, it does not mean that they are unable to identify possible risks of their use in the educational environment (Baidoo-anu & Ansha, 2023). The fact that LLMs are able to identify possible problems and risks faced by both teachers and students for making use of these tools helps to understand the development that conversational AIs are undergoing, being able to think and act like humans focused on achieving the goals set out in the questions and actions they are asked to perform (Akgun & Greenshow, 2022).

Concerning the second objective, as expected, conversational AIs answer questions about identification and listing each of the benefits offered by their use in education. such as saving time in class preparation that leads to improving teaching quality, or being able to develop educational resources, exercises, evaluation of the learning process, etc. In recent years, a multitude of benefits have been observed for teachers in the use of AI in their subjects: providing greater teaching efficiency; relieving pressure on their teaching work by providing support; offering tutoring systems that provide AI-generated feedback that promotes a more focused teaching in the classroom; or in interaction, reducing the organisation work and development of teaching materials (Chiu et al., 2023; Denecke et al., 2023). But they are also able to identify the potential for students and for the development of their talents, promoting increased motivation, engagement and self-confidence building, preparing them for the future, among other benefits. Several studies have analysed the learning benefits of using chatbots in education in recent years (Boubker, 2024; Ngo, 2023; Rad et al., 2024). Some examine the positive impact on students (Wang et al., 2023), such as the ability to self-improve, personalised response and, increased information accessibility, facilitating complex learning (Farrokhnia et al., 2023), while also identifying benefits for motivation, interest, improved academic performance, improved communication and teamwork (Adiguzel et al., 2023). It is clear that Artificial Intelligence has become a vital tool in education, promoting efficiency and effectiveness in teaching processes (Bolaño-García & Duarte-Acosta, 2024).

With regard to the last objective, AIs identify the dangers of their use in relation to the challenges faced by teachers and students in learning. These risks are directly related to inappropriate uses, such as lack of monitoring of the veracity of the data provided by the AI, as well as irresponsible use that can lead to loss of skills and abilities in students. That is, conversational AIs have been trained to understand academic dishonesty by identifying the ability of students to fail to make responsible and ethical use of AIs like them in learning, writing papers, taking exams or plagiarising, etc. (Sweeney, 2023; Zhao et al., 2022). One of the issues currently being raised regarding the inappropriate use of conversational AIs is the democratisation of plagiarism (Farrokhnia et al., 2023). None of the responses of conversational AIs are usually an exact copy of a particular text, but rather often synthesise training data. Nevertheless, they may present wording with a high degree of similarity from other existing sources (OpenAI, 2022). However, with this in mind, language models can integrate plagiarism detection tools, such as Turnitin, so that students themselves can check their work for plagiarism, and this work self-check is very useful to ensure that it meets academic integrity standards (Khowaja et al., 2024). An interesting finding from the interviews held is the ability of AIs to identify strategies for appropriate use, for example by checking information sources, supervising students' use or the necessary teacher training for teachers to be able to monitor students' use, among others. AI has great potential as an effective tool to help students, but this information may or may not be valuable, depending on the use they make of it and the instructions or the formulation they use to get feedback, which means that the potential will depend on the literacy of the students or teachers (Pham et al., 2023). A number of limitations have been identified in the use of AI in education. Several unintended impacts are observed in the inappropriate use of AI in education such as abuse, incorrect manipulations, lack of privacy, inaccurate answers that are not checked and ethical issues (Adiguzel et al., 2023; Klimova et al., 2023). These impacts are seen as challenges that teachers and students must face. These are challenges of use and, above all, ethical challenges that must be taken into account for the improvement of AI use in education. Fortunately, there is now a high awareness of the need to respect and employ diverse perspectives on the ethics of AI when designing, programming and creating mobile applications for various purposes, including education (Stenseke, 2022). In education, it is important to bear in mind that these tools are used by children and adolescents, as they are in the ongoing process of education and will be impacted by these technologies (Klimova et al., 2023). It is necessary to comprehensively examine the effects of AI integration in education and learning, perceiving the role of AI as a support and not as a substitute for teachers, being able to examine the risks and negative impacts and taking advantage of the benefits that improve learning outcomes (Fu & Weng, 2024).

The present work has limitations that should be identified for future studies. Firstly, as identified throughout the paper, conversational AIs are trained to respond to the questions asked, so responses may be biased or inaccurate when identifying benefits and risks. Secondly, the free version of the AIs was used in the study, as they would be the ones that would mainly be accessed by university and non-university students, but they might not be highly developed, being more limited in their answers than the paid version. Given that the free version is being used, it is important to bear in mind that the quality of the results may be limited compared to the paid version, as well as any differences in the models' security policies. It is also important to note that the interview was conducted without modifying the prompts, at a specific point in time, without allowing the interaction to develop based on the AI's response. Nevertheless, this study is a first approximation from the perspective of the AIs themselves on both the positive and negative impact of their use in education. Providing a clear overview of how generative AI has been trained to serve as a development model in education, helping to understand the impact it has had on teaching and learning processes. Future studies should delve deeper into their use by teachers and students and the potential they themselves see in their use in education.

In short, conversational AIs open up a range of possibilities for their use in education, offering a multitude of benefits and opportunities to improve the learning process. However, the fact that these tools exist does not mean that they should be used without having the digital skills to use them appropriately. As reflected in the responses from the conversational AIs analysed, misuse leads to a negative impact, and reducing these dangers, so that the experience of using them is satisfactory, remains a great challenge for educators and students.

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Authors' contributions

Arminda Suárez-Perdomo conceptualization, methodology, investigation, writing-original draft preparation, and editing.

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Data availability

Data included in the article itself or supplementary material

Use of Artificial Intelligence

The authors declare that the content of the article has not been developed using Artificial Intelligence. They specify the purposes for which it has been used.

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