

AI Generative in Brazil's Public Schools: The Teachers' Perspective

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Abstract: Artificial Intelligence (AI) alters the societal landscape and transforms people's lives. In the realm of education, AI offers many opportunities and challenges in teaching and learning. While AI holds promise in enriching learning experiences and fostering motivation, its successful integration into educational practice necessitates that both students and teachers possess digital competence. Education plays a critical role in preparing future workforces. In South America, Brazil stands as the most populous country, with 212.6 million people. The utilisation of AI generative tools, such as ChatGPT, for teaching purposes in the country, is on the rise, albeit constrained within the educational context. Challenges faced in integrating AI generative tools in Brazil's education system include the facilitation of plagiarism and teachers' insufficient digital competence. In an effort to delve into the intricacies of teachers' experiences and challenges regarding the integration of AI generative tools into their pedagogical practice, a qualitative study was conducted, and nine teachers in an upper secondary school in Brazil answered a questionnaire involving seven open questions. The teachers perceive the integration of AI generative tools into teaching practice as an instrument that enhances opportunities for improving the quality of teaching, stimulating student interest, and enriching the dynamism of the content learning process. Teachers have highlighted ChatGPT as a valuable tool for research and consultation. This tool can simplify teaching tasks and is typically well-received by students. Both teachers and students can utilise this tool to generate materials such as lyrics and textual variations and even produce fully composed songs ready for listening. ChatGPT is also used to prepare and correct assessments, ensuring consistency in evaluation. Teachers use AI to prepare texts, quizzes, and multiple-choice tests. AI-generated images are also used to enhance illustrations, making learning materials more engaging and visually appealing. Although AI simplifies complex subjects and makes the learning process more engaging, it is essential to provide adequate training on AI tools to enhance student involvement and educational results.

Keywords: Artificial intelligence, Developing country, Education, School, Teacher, Teaching

1. Introduction

In recent years, the use of artificial intelligence (AI) has increased worldwide, creating opportunities and challenges in many areas, such as education. This is an important standpoint because, as Freire (2020) explained, education helps people find their voices and become more conscious, enabling them to reach their full potential by speaking, thinking, and acting freely. In developing countries, access to and use of AI generative technologies may be limited due to a lack of financial opportunities, well-functioning infrastructure, and teachers' skills in using AI as an educational tool. Yet, AI generative technologies are a reality that cannot be ignored.

In the realm of education, AI brings a host of opportunities and challenges to teaching and learning. Although AI can significantly enhance learning experiences and increase motivation, successful integration into educational practices depends on both students and teachers having strong digital skills (Kuka et al., 2022). However, de Oliveira Durso and Arruda (2022) explain that perceiving AI as having independent intentions is unrealistic.

AI is becoming more advanced, changing how education works, which increases the need for understanding how this tool can be used in teaching and learning practices (Gunnars, 2024). This paper intends to understand how teachers in Brazil's upper secondary schools perceive AI in teaching practice and the opportunities and challenges related to the integration of AI in teaching. The following research questions are put forward:

RQ1: How do teachers in Brazil's upper secondary schools perceive the integration of AI generative tools in teaching?

RQ2: What opportunities and challenges related to the integration of AI generative tools do teachers in Brazil's upper secondary schools describe?

2. Background

Artificial intelligence (AI) is transforming the world, people's lives, and the education systems. This technology provides numerous opportunities, but it also brings challenges that we must address. For instance, it is not just about using AI; it is about how we use this tool effectively for teaching and learning. Silva (2022) highlights a shift in the pedagogical process where techniques play a decisive role in shaping educational outcomes.

Education is crucial in preparing workforces for an uncertain future. The integration of AI tools not only involves adopting advanced technologies to enhance learning and address the AI skills gap but also requires a reformation in educational approaches (Pedro et al., 2019). From the perspective of developing countries, understanding

teachers' views on using AI in their teaching practice is crucial. These teachers face unique challenges when integrating this technology into their classrooms. Brazil, the most populous country in South America with about 215 million people, serves as an important example. According to Carius (2021), the use of digital technologies in schools in Brazil remains precarious. The Brazilian education system faces challenges in integrating these AI tools include facilitating plagiarism, teachers' lack of digital skills, and worsening educational inequality (Godoi, 2024). Exploring how teachers in Brazil integrate AI tools into their teaching practice and the challenges they encounter can offer valuable insights. By understanding these opportunities and challenges, we can better support teachers worldwide in harnessing AI to enhance education for all. In light of this context, AI rises as a transformative force with the potential to revolutionise educational practices, making learning more engaging and accessible. However, realising this potential requires addressing the associated challenges and ensuring that both teachers and students are adequately prepared to utilise AI effectively.

Russell and Norvig (2016) describe AI as an intelligent system capable of maximising task success rates. This technology presents significant opportunities for enhancing teaching and learning practices, such as personalised learning experiences and more efficient administrative tasks. However, AI distinguishes itself from other classroom technologies by its autonomous and automated approach to performing tasks (DURSO, 2024). Lindqvist and Arvidsson (2024) emphasise that teachers must critically assess AI resources and tailor them to fit their educational contexts.

To address challenges, the use of AI generative technology in education needs structured training, support, and clear policy guidelines for both students and teachers (Albadarin et al., 2024; Adeshola and Adepoju, 2023). According to Albadarin et al. (2024), more research and proactive dialogues with policymakers, stakeholders, and educational practitioners are needed to refine and enhance AI use in teaching and learning practices.

2.1 ChatGPT in Education

The term ChatGPT stands for Chat Generative Pre-training Transformer, an AI chatbot based on large language models (LLM) (Zhao et al., 2023). This online text-based AI chatbot can interact with humans and generate human-like responses. In a literature review, Mai et al. (2024) identified 51 articles on the use of ChatGPT in educational practices. Only three of these articles were from South America: two from Peru and one from Uruguay.

ChatGPT is one of the several AI tools that have been used in education. Its impact on pedagogical practices and student engagement has been discussed due to the opportunities and challenges that the use of ChatGPT entails. This tool has the potential to revolutionise educational practices, but the challenges connected to its integration need to be taken into account (Mohebi, 2024). Islam and Islam (2024) explored the opportunities and challenges of ChatGPT in education and explained that ChatGPT could offer personalised learning experiences for students but may also provide false information due to mistakes in its training data. Leite (2023) pointed out that ChatGPT can, among other possibilities, write and summarise texts, answer questions, and draw up lesson plans.

There is potential in using ChatGPT in educational practices, but careful integration and adaptation of this tool, along with improved professional development for teachers in utilising ChatGPT and other AI tools in teaching and learning practices, are essential (Al-khresheh, 2024). Teachers recognise ChatGPT's usefulness in various applications, such as lesson preparation and creating learning activities, but they also express concerns that students may become dependent on ChatGPT and question their own knowledge (Ulla et al., 2023). Using ChatGPT in teaching practice may enhance students' motivation and satisfaction with learning processes (Woo et al., 2024). However, according to Al-khresheh (2024), teachers should allow students enough time to enhance their engagement with materials and tasks. Students need to use critical thinking when using ChatGPT in learning processes, and teachers can use ChatGPT to generate responses as models for developing students' critical thinking skills (Janse van Rensburg, 2024). Jayaron and Blessy Jayaron (2024) argue that further research is necessary to understand the implications of tools like ChatGPT and to develop effective anti-cheating strategies.

Sandu et al. (2024) pointed out that the discourse surrounding ChatGPT in education settings encompasses a range of perspectives, highlighting the pedagogical utility, ethical considerations, and potential challenges. The scholars emphasised that while ChatGPT provides personalised and flexible support for students and teachers, it is limited in understanding complex queries and lacks human interaction. However, frequent users of ChatGPT perceive more benefits from this tool than those who do not use it (Sandu et al., 2024).

3. Method

This study adopted a qualitative research design to facilitate the extraction of significant insights from the data (Cohen et al., 2017). The data were collected by distributing a questionnaire to thirty teachers in an upper secondary school in Brazil. Only nine teachers, which is about 30 percent of the respondents, have answered the questionnaire. This low response rate in the questionnaire can be addressed by elements such as teachers' workloads and the time the questionnaire was distributed, May and June, before the mid-year holidays.

3.1 The Questionnaire Construction

The questionnaire comprised a total of fourteen questions, divided into two sections: seven background questions and seven open questions. The background questions gather information about the respondents, such as their teaching experience, subject areas, and familiarity with AI technologies. Nine teachers, four men, and five women answered the questionnaire. Over 50 % were aged 30-50 and had 5-15 years of experience. All nine teachers had received teacher training and were qualified to teach their subjects.

The open questions explored the perceptions, opportunities, and challenges associated with the integration of AI, specifically ChatGPT, into educational practices. These questions aimed to understand how teachers perceive the impact of AI on their teaching practices, the ways they are currently using AI tools in their classrooms, and the opportunities they have observed from such integration.

3.2 Data Analysis

Inspired by Braun & Clark, the data was unpacked and analysed thematically. First, I familiarised myself with the data by reviewing the collected data. After that, I organised the data to generate codes and search for themes. For example, AI, such as ChatGPT, helps prepare questions and update the creation of assessments. These two codes are connected because they are about AI as a transformative tool in teaching practice. It is important to note that, these codes are not strictly limited to a single theme. After the codes were generated and themes revised, I clustered codes into themes. Five themes were found: AI as a transformative tool, AI in assignments and tests, efficiency and engagement, challenges in AI integrations, and evaluating student engagement. To strengthen the data, some quotations were included.

3.3 Method Discussion

Due to the short timeframe and difficulty scheduling teachers, I decided to send the questions by e-mail. This approach allowed teachers to respond at their convenience, as they could choose the most suitable time to answer the questions. However, a drawback is that I could not observe the teachers' facial expressions and body language, which are visible during face-to-face interviews. This lack of visual cues limits interpreting non-verbal communication.

4. Findings

This section presents the findings of this study. Five themes have been founded: AI as a transformative tool, AI in assignments and tests, efficiency and engagement, challenges in AI integrations, and evaluating student engagement. The findings may not be universally generalisable, but they improve the knowledge of the importance of perceptions of AI tools in teaching practice. Table 1 summarises the findings of this paper.

Table 1: Summary of AI impact on education: key themes, descriptions and teacher quotations

Theme	Description	Teacher Quotation
AI as a transformative tool	AI improves teaching, creates assessments, and boosts participation.	<p>"AI can be used in my didactics and in my working methodologies."</p> <p>"AI can be used for research and consultation, which is excellent. It can produce materials such as lyrics, variations of texts, and even the final version of a song ready to be listened to."</p>
AI in assignments and tests	AI aids in preparation, grading ensuring consistency in evaluations and activities.	<p>"AI can be used for correcting assessments, formulating activities and, above all, checking the activities carried out by the students."</p> <p>"AI can be used to prepare texts, quizzes, and tests with alternatives A, B, C and D."</p>

Theme	Description	Teacher Quotation
Efficiency and engagement	AI increases efficiency, boosts participation, and optimises teaching time.	“AI offers agility and speed in processing information.” “AI is a tool for time optimisation at work.”
Challenges in AI integration	Meeting individual needs, verifying sources, and adapting to new tech.	“A challenge is to recognise each student’s difficulties and check the legitimacy of the sources.” “A challenge is teachers’ mastery of technology.”
Evaluating student engagement	AI simplifies learning but risks superficial understanding; training is essential.	“It is easier to teach.” “We can see that young people are very connected to technology. There is a lot of interest in using computers, perhaps not yet in terms of studies, but in general contexts such as games, social networks, and various websites.”

4.1 AI as a Transformative Tool

Teachers perceive generative AI as a transformative tool in their teaching practice, offering several opportunities and improvements. They noted that AI helps in preparing questions, updating the creation of assessments, and adapting them to different learning levels. One teacher pointed out, “AI can be used in my didactics and in my working methodologies.” Specific areas where AI has been helpful include enhancing both student learning and teaching practice, particularly in active participation and engagement strategies. Another teacher highlighted AI’s role in research and consultation, noting how it assists in producing materials like song lyrics, text variations, and complete songs, thereby enhancing the creative aspects of teaching and providing diverse learning resources. The teacher explained “AI can be used for research and consultation, which is excellent. It can produce materials such as lyrics, variations of texts, and even the final version of a song ready to be listened to.” This capability highlights how AI tools, including ChatGPT, Google Search, and YouTube enhance the potential for improving learning outcomes. By making information more accessible, these tools trigger student interest and add dynamism to the classroom experience.

4.2 AI in Assignments and Tests

Teachers frequently utilise AI tools for assignments and tests, highlighting their flexibility in educational practices. These tools play a crucial role in both preparing and grading assessments, ensuring a consistent evaluation process across students. One teacher emphasised that “AI can be used for correcting assessments, formulating activities and, above all, checking the activities carried out by the students.” This use of AI not only saves teachers time but also facilitates more frequent and varied assessments, thereby enhancing the overall efficiency and effectiveness of the evaluation process.

In the realm of content creation, AI proves invaluable for generating texts, quizzes, and multiple-choice tests. These AI-generated materials are adapted to meet teaching objectives while maintaining relevance. Moreover, according to teachers, AI extends its utility to enhancing visual learning benefits through the creation of images and illustrations. Another teacher explained, “AI can be used to prepare texts, quizzes, and tests with alternatives A, B, C and D.” These visuals not only reinforce learning concepts but also capture students’ attention, thereby enhancing their overall engagement with the learning materials.

4.3 Efficiency and Engagement

Teachers highlighted the ease and speed provided by AI tools, noting a significant increase in efficiency. AI allows them to accomplish tasks more quickly than traditional methods. One teacher clarified, “AI offers agility and speed in processing information.” AI also serves as an extra tool to encourage student integration by offering diverse and innovative ways to engage students, creating a more inclusive and interactive classroom atmosphere. Teachers pointed out that this integration encourages students to participate more actively in their learning process. A further advantage is the optimisation of time. One teacher pointed out, “AI is a tool for time optimisation at work.” AI tools help simplify various tasks, making it possible for teachers to focus on essential aspects of teaching, such as personalised instruction and student support. AI also summarises content and provides quick access to information, offering teachers and students many possibilities for deeper exploration and understanding of subjects.

4.4 Challenges in AI Integration

Concerning the integration of AI in teaching, teachers have highlighted several challenges. A significant challenge is addressing each student’s difficulties and verifying the legitimacy of sources. One teacher explained, “A

challenge is to recognise each student's difficulties and check the legitimacy of the sources." Teachers also emphasised that traditional teaching methods allow them to interact directly with students, observe their struggles, and provide personalised support. With AI, there is a risk of missing these nuances, as the technology may not always respond precisely to each student's unique needs. Ensuring the information provided by AI is accurate and from credible sources is crucial to prevent misinformation.

Another challenge is adapting to new tools. Many teachers have spent years enhancing their skills with traditional methods and may find it challenging to learn and integrate new technologies. This adaptation process requires time, training, and dedication, which can be problematic for some. There is also the challenge of avoiding too much reliance on AI for lesson preparation. While AI can be a powerful assistant, it is essential for teachers to maintain their creativity and ingenuity. Over-reliance on AI might lead to a decline in these skills and reduce the personalised touch they bring to their classrooms.

Lastly, one teacher pointed out, "A challenge is teachers' mastery of technology." Not all teachers are equally comfortable with or proficient in using new technologies. Bridging this gap is necessary to ensure the effective use of AI tools and that all students benefit from their potential.

4.5 Evaluating Student Engagement with AI

Teachers have shared insights on student engagement with AI tools like ChatGPT in teaching. Some teachers have noted that learning becomes easier with the integration of AI, as these tools can simplify complex topics and provide instant access to information, making it easier for students to grasp new concepts and for teachers to present material engagingly. However, there is also a concern that AI can hinder genuine learning, as students might copy information from AI outputs without understanding the content. This practice undermines the learning process and does not encourage critical thinking or deep understanding.

On the positive side, some teachers have observed that students react well to the use of technology in the classroom. One teacher pointed out, "It is easier to teach." The familiarity and interest students have in technology help to make lessons more engaging and interactive. Yet, students need proper training on effectively using AI tools. Without understanding how these tools work and their appropriate uses, students may continue to use them in ways that do not enhance their learning process. Proper training promotes AI in ways that promote deeper engagement and better learning outcomes.

Interestingly, one teacher mentioned a lack of experience in observing students using AI tools like ChatGPT. The teacher noted, "We can see that young people are very connected to technology. There is a lot of interest in using computers, perhaps not yet in terms of studies, but in general contexts such as games, social networks, and various websites." While young people are connected to technology through games, social networks, and websites, this interest does not always translate directly into educational engagement.

In summary, AI serves as a transformative tool in education, enhancing teaching practice by assisting with question preparation, assessment updates, and the creation of diverse teaching materials, such as song lyrics and text variations. Teachers utilise AI for efficiently preparing and correcting assignments and tests, ensuring consistent evaluation. AI also facilitates the creation of engaging texts, quizzes, and AI-generated images, optimising teaching efficiency and promoting deeper understanding through quick content summarisation. Despite its advantages, integrating AI into education poses challenges, including addressing individual student needs, verifying sources, and adapting to new technologies, which require time and training. Additionally, there is concern about potential over-reliance on AI, which may diminish teachers' creativity and students' critical thinking.

5. Discussion

This paper intends to understand how teachers in Brazil's upper secondary schools perceive AI in teaching practice and the opportunities and challenges related to the integration of AI in teaching. In returning to the research questions, the first question yielded information about how teachers in Brazil's upper secondary schools perceive the integration of AI generative in teaching.

Overall, teachers perceive generative AI as a valuable addition to their teaching tools, which aligns with the findings of Sandu et al. (2024). They are integrating AI into educational practices in innovative ways, such as creating and grading assignments, developing engaging learning materials, and providing immediate support and clarification to students. These applications enhance the efficiency, effectiveness, and interactivity of teaching and learning processes. Teachers see both opportunities and challenges in using AI, like ChatGPT, in

education. While these tools can make teaching easier and students often respond well to the integration of technology, there are concerns about superficial learning practices and the need for proper training. Teachers raised the issue of whether students should use tools like ChatGPT in their learning. At the same time, they emphasised that it is more a question of how and when an AI generative tool should be used, rather than whether they should be used at all. This perspective aligns with Lindqvist and Arvidsson (2024) emphasis on assessing AI resources in specific educational contexts. Teachers also pointed out that more experience is necessary to fully understand and evaluate student engagement with AI in educational settings.

The second research question revealed what teachers in Brazil's upper secondary schools perceive as opportunities and challenges of AI. Teachers identified several advantages of using AI, such as ChatGPT, over traditional teaching methods. These advantages include increased ease and speed, enhanced student engagement, time optimisation, and improved information processing, all contributing to a more effective and dynamic educational experience. These findings align with Leite's (2023) statement that ChatGPT offers many opportunities in education. The integration of AI in assignments and tests also underscores its transformative impact on educational practices, offering teachers innovative tools to optimise learning experiences and promote educational success among students.

However, AI also presents challenges, such as addressing individual student needs, verifying source legitimacy, adapting to new tools, avoiding over-dependence on technology, and ensuring teachers are technologically competent. This relates to Jayaron and Blessy Jayaron's (2024) argument about the need to understand the implications of AI in education and to develop effective anti-cheating strategies. Teachers have emphasised that addressing these challenges is essential for successfully integrating AI into teaching, aligning with Albadarin et al. (2024). While AI simplifies complex topics and makes learning more engaging, proper training in AI tool usage is crucial for enhancing student engagement and learning outcomes.

In summary, while AI makes complex topics easier to understand and learning more engaging, it is crucial to have proper training in using AI tools to improve student engagement and educational outcomes. Teachers recognise both the potential opportunities and the challenges of incorporating AI, like ChatGPT, into their teaching practice. These tools can simplify teaching tasks and are generally well-received by students. However, there are concerns about superficial learning and the necessity for comprehensive training. To fully grasp and assess the effects of AI on education, more structured studies and practical experience are needed to close the gap between students' familiarity with technology and their educational engagement.

5.1 Implications

The practical implications highlight the importance of digital competence among teachers in using AI generative tools. Teachers recognise both the potential opportunities and challenges associated with integrating AI, such as ChatGPT, into their practices. AI generative tools can enhance teaching efficiency, student engagement, and learning outcomes. However, ongoing professional development is essential to equip teachers with the skills and knowledge necessary to fully use AI's potential in enhancing educational experiences. Moreover, fostering digital competence among teachers not only aids in AI tools but also enables them to tailor learning experiences and support diverse student needs.

6. Conclusion

Teachers in Brazil's upper secondary schools perceive generative AI, like ChatGPT, as a valuable addition to their teaching toolkit, offering numerous benefits and improvements. They integrate AI into educational practices innovatively, using it to create and grade assignments, develop engaging learning materials, and provide support to students. These applications significantly enhance the efficiency, effectiveness, and interactivity of the teaching and learning process.

Teachers identify several opportunities and challenges associated with AI integration. AI tools like ChatGPT simplify teaching tasks, improve learning experiences, and promote educational success by enhancing speed, ease, and efficiency in assignments and tests. These tools facilitate rapid information processing and provide interactive learning that engages students. Despite the opportunities, integrating AI presents challenges such as addressing individual student needs, verifying source legitimacy, adapting to new technologies, and avoiding excessive reliance on AI. Balancing technological dependency is crucial to maintaining students' critical thinking. Teachers emphasise the importance of training to use AI effectively and creatively in teaching while ensuring it complements traditional teaching approaches rather than replacing them.

AI simplifies complex topics and makes learning more engaging by quickly processing information and adapting content to different learning levels. However, the effective integration of AI into education requires digital competence and training in AI tool usage to maximise student engagement and improve learning outcomes.

Bridging the gap between students' technological familiarity and educational engagement is crucial and necessitates structured learning and practical experience.

6.1 Future Research

Future research is needed to understand the impact of AI generative tools on teachers' and students' utilisation of this technology in both teaching and learning practices. This area deserves attention due to the potential influence of AI use on teachers' creativity in teaching practice and students' development of critical thinking. Further exploration could shed light on how these tools shape teachers' daily practices and students' learning behaviours, educational performance, and overall educational experiences.

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