

Generative AI in Academic Settings: Exploring ChatGPT Adoption and Implications

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Abstract

This research delves into the multifaceted aspects influencing the adoption and utilization of ChatGPT among postgraduate students. Executed as a qualitative study involving participants from a prominent federal university, the primary objective was to discern students' nuanced perceptions of ChatGPT and their inclination to embrace it as an academic support tool. Based on Unified Theory of Acceptance and Use of Technology, the study employed thematic analysis with a focus on critical dimensions. Results illuminate that students are motivated to amplify academic performance, boost productivity, and streamline time management, with ChatGPT emerging as a user-friendly solution. Peer and faculty influence further solidified its integration, evolving into a habitual tool, and the availability of a free version significantly contributed to its widespread adoption. This research highlights the growing prevalence of ChatGPT across diverse academic activities, encompassing exploratory research, programming, presentations, and email composition—however, varying opinions surface regarding its efficacy and limitations in scientific text production. The research findings, particularly in the context of technology assimilation in academia, hold significant relevance for educational policymakers and practitioners. They offer valuable insights that can help form policies that foster the judicious and effective integration of technology within educational settings.

Keywords: UTAUT, postgraduate students, educational policy implications, Artificial Intelligence

1. Introduction

The technological landscape is becoming increasingly intertwined with our daily lives, marked by innovations such as Big Data, the Internet of Things (IoT), and Artificial Intelligence (AIs), influencing private and public organizations across various sectors. Universities and other higher education institutions are not exempt from this wave of technological influence. Artificial Intelligence (AI) has been extensively debated among the technologies shaping the academic environment.

Amidst various forms of AI, generative AI stands out with its notable growth and substantial investments. Grounded in specific types of artificial neural networks trained on massive datasets, this technology, as described by McKinsey and Company (2023), is evaluative, allowing knowledge acquisition by the network users. The foundation of ChatGPT, a language model developed by OpenAI in 2022, rests on this generative AI, which is experiencing significant growth both in Brazil and globally. ChatGPT can generate a wide range of written content, including essays, reviews, literary manuscripts, journalistic pieces, and even scientific texts.

Students and faculty increasingly adopt ChatGPT to formulate questions, summarize articles, suggest presentation topics, and more. Research studies, like those by Dowling and Lucey (2023) in finance and Burger, Kanbach, Kraus, Breier and Corvello (2023) in Administration, emphasize AI's supportive role in various research methods, making researchers' work more efficient, reliable, and convenient.

However, cautionary voices, like Rossoni (2022, p. 402), warn about the limits of ChatGPT use, stressing that it is not a "magical solution" for all scientific writing challenges and should not replace human review and editing. In the field of Administration, controversies surround the tool, addressing concerns about content accuracy, information veracity, result reliability, and ethical issues such as plagiarism, biases, prejudices, privacy, and authorship.

In this context, our research endeavors to unveil the intricate factors shaping the adoption and utilization of ChatGPT among postgraduate students in an Administration program. We conducted a qualitative study involving ten participants from a federal university, employing analytical categories rooted in the Unified Theory of Acceptance and Use of Technology (UTAUT 2) developed by Venkatesh, Thong and Xu (2012), as recently applied by Strzelecki (2023). While UTAUT 2 is conventionally employed with quantitative methodologies, this study innovatively adapted its categories for qualitative analysis. The results contribute to a holistic comprehension of the forces influencing ChatGPT adoption and use within the unique context of postgraduate students in an Administration program.

In the dynamic landscape of higher education, where the integration of Artificial Intelligence (AI) poses intricate challenges, particularly with generative AI exemplified by ChatGPT, our research significantly contributes to the ongoing dialogue on technology adoption within academic institutions. The outcomes of our study offer insightful perspectives into the factors influencing the adoption and usage of ChatGPT among postgraduate students. These insights provide valuable considerations for educational policymakers and practitioners, illuminating the nuanced interplay between AI adoption and educational policies. Through this exploration, our study aspires to cultivate a comprehensive understanding of the educational landscape's complexities, policy implications, and innovative practices amid the evolving role of technology in academia.

The subsequent sections of this work will delve into the theoretical framework (Section 2), methodology details (Section 3), discussion of obtained results (Section 4), and conclude with recommendations for further studies (Section 5).

2. Theoretical Framework

2.1 Artificial Intelligence

Artificial Intelligence (AI) has been a remarkable and rapidly advancing technological innovation in recent years. According to Russell and Norvig (2010), its first recorded instance dates back to 1956, post-World War II. As Russell and Norvig (2010) described, AI constitutes an interdisciplinary field encompassing many disciplines, including philosophy, mathematics, economics, neuroscience, psychology, computer science, linguistics, and others. These disciplines converge to develop capabilities that enable systems to learn from diverse datasets. A McKinsey study from 2022 revealed that AI adoption more than doubled in the last five years, with investments in this technology rapidly increasing (McKinsey & Company, 2022). Furthermore, the use of Artificial Intelligence (AI) in research is becoming increasingly common, especially concerning generative AI (Byrne, 2023; Rossoni, 2022; Velásquez, 2023; Strzelecki, 2023).

Numerous contemporary examples of Artificial Intelligence have sparked substantial debates. Some noteworthy instances include Codewhisperer (a free solution presented by Amazon that utilizes AI to provide code suggestions, facilitating programmers' work), Midjourney and DALL-E (capable of creating images from text instructions), ChatPDF (a personalized document summarization service), GPT-3, GPT-4, and ChatGPT (generative language models capable of understanding and producing natural language). These examples illustrate how Artificial Intelligence is advancing across various domains, such as programming, image creation, document summarization, and language processing.

In the business realm, according to Maciel (2023), the use of these technologies can enhance productivity by assisting in concept comprehension, summarizing information, generating and evaluating recommendations, and optimizing processes through algorithms, among other benefits. Mainly, ChatGPT, the focus of this study, has garnered attention from businesses, the academic community, and the media, as evidenced by the substantial number of searches on Google in recent months, totaling over 650,000,000 searches as of February 23, 2023 (Benuyenah, 2023).

2.2 ChatGPT, Its Uses, and Limitations

O'Leary (2023) analyzed the differences, strengths, and limitations of three chatbots that use generative AI: Meta AI's BlenderBot, Google's LaMDA (which later gave rise to Bard), and OpenAI's ChatGPT. In a Google research trend analysis, O'Leary (2023) pointed out some research trends on LaMDA, but further progress is needed. The interest in BlenderBot was limited; however, ChatGPT attracted interest from the general public.

ChatGPT is a language model created and trained by the OpenAI company to answer various questions from its vast and diverse user groups (OpenAI, 2023).

Translate to English: ChatGPT is a language model developed by OpenAI that uses Artificial Intelligence (AI) to interact in natural language with users. It is part of the OpenAI GPT (Generative Pre-trained Transformer) model family. ChatGPT is trained on a vast amount of textual data collected from the internet

and other sources. It learns to understand the context of questions and responses, generating coherent answers based on what it learned during training. The goal of ChatGPT is to provide a virtual conversational assistant that can answer questions, offer support, and perform specific tasks (OpenAI, 2023).

The use of ChatGPT has sparked much discussion and controversy in the academic community and society. Its limitations, ethical implications, and social aspects have been the focus of study by researchers from different disciplines (Velasquez, 2023). Generative AI tools like ChatGPT have the potential to change the way various tasks are executed; however, the full extent of this impact, as well as the associated risks, is still unknown. Research efforts are underway to evaluate these aspects (Rossoni, 2022; Malinka et al., 2023; Byrne, 2023; Velásquez, 2023; Strzelecki, 2023).

Malinka et al. (2023) report that Dutch students have admitted to using ChatGPT for homework. Additionally, articles, texts, and announcements have been disclosed as being constructed with the assistance of this technology. For example, the editorial by researcher Luciano Rossoni in the *Electronic Journal of Administrative Science (RECADM)* from September-December 2022 (v.21 n.3) presents ChatGPT as a co-author. Interestingly, SPELL recognizes only humans as authors (Rossoni, 2022). Some debates in the editorial include the difficulty of distinguishing a student's writing from that of an AI, alternatives for learning assessments, and the need for more sophisticated plagiarism detection software. In another context, the same editorial lists the contributions of ChatGPT to reviewing articles, emphasizing that automated writing may be less prone to errors than human writing (Rossoni, 2022).

On the other hand, the editorial by Irigaray and Stocker (2023, p. 2) is more critical: "We advocate that the misuse of AI tools, notably to manipulate or distort scientific records, be penalized rigorously". In another instance, the journal *Science* (Thorp, 2023) updated its editorial policies regarding texts, figures, images, or graphics generated by ChatGPT or another AI tool.

Gordijn and Have (2023) also debate about the evolution or revolution of ChatGPT. As an evolution, it is another increasingly available tool for academics when conducting research and writing articles. It can be helpful as a search mechanism that directly responds to questions and can provide an initial draft of a new text. As a revolution, progress in artificial intelligence may allow ChatGPT to have the ability to write articles that pass through peer review. According to Gordijn and Have (2023), in the long term, AIs may even take over entire areas of scientific research.

Farias (2023, p. 80) suggests that ChatGPT "[...] has the power to revolutionize academic writing positively". However, he presents relevant questions for reflection:

I have experienced, in contact groups and social networks, a certain panic in the academic community related to the use of ChatGPT in the development of academic texts, including articles for journals and the preparation of dissertations and theses. Academic productivity gains an ally with the help of AI. Would we be subject to unethical researchers and students who no longer need to reflect on scientific topics critically, and thus, the evolution of knowledge would be limited (or unlimited to Artificial Intelligence)? (Farias, 2023, p. 80).

According to Eke (2023), a multi-stakeholder effort is needed to create solutions for academic integrity. In his article, he mentions a series of actions that academic institutions should take to mitigate the negative impact of ChatGPT, such as establishing training and education, reviewing scientific integrity policies, making necessary changes to reflect the current possibilities of AI, and developing reliable tools to identify possible unethical use.

The adoption and diffusion of technologies like ChatGPT depend on factors such as access, practicality, security, price, motivation, and utility, among others). One of the models used to understand the adoption and use of new technology is the Unified Theory of Acceptance and Use of Technology (UTAUT) and its extended version—UTAUT 2 (Venkatesh, Thong, & Xu, 2012), which have already been widely applied in the field of technology and user behavior research.

In a recent study using the UTAUT 2, Strzelecki (2023) developed a model to examine the predictors of adoption and usage of ChatGPT among higher education students in Poland. In the study, employing structural equation modeling, it was found that "habit", "performance expectancy", and "hedonic motivation" were the best predictors of behavioral intention. The following section presents the methodological procedures of this article, which opted for a qualitative research approach.

3. Research Methodology

This study adopted a qualitative approach using the thematic analysis method, and data were collected through

interviews (Godoy, 1995; Flick, 2006). Qualitative research aims to understand participants' perspectives, everyday practices, and knowledge of the issue under analysis. In this type of research, researchers study phenomena in their contexts, seeking to comprehend and interpret them based on the meanings attributed by the individuals involved (Godoy, 1995; Flick, 2006; Denzin & Lincoln, 2006; Bauer & Gaskell, 2017).

Data were collected through interviews with ten students (Table 1) from a Postgraduate course in Administration at a federal university (the name was preserved as per the informed Consent Form) to investigate the use of artificial intelligence in this context. The interviews were conducted from April to June 2023. The selection criteria were established based on using ChatGPT (in postgraduate activities), excluding students who used it solely for purposes other than those related to academia. It is important to note that the people included in this study were selected through a convenient sample, chosen for their accessibility and willingness to participate. The interviews were scheduled until saturation was reached, where additional interviews yielded only some new insights or information (Appendix A). The interviews were recorded in audio using Microsoft Teams software to analyze the data. Subsequently, the transcriptions of these recordings were performed.

Table 1. Profile of interviewees and duration of interviews

Interviewees	Courses	Duration
Interviewee 1 (male)	Master's student	37 minutes
Interviewee 2 (male)	Ph.D. student	23 minutes
Interviewee 3 (female)	Master's student	30 minutes
Interviewee 4 (male)	Ph.D. student	46 minutes
Interviewee 5 (male)	Ph.D. student	43 minutes
Interviewee 6 (male)	Master's student	19 minutes
Interviewee 7 (female)	Master's student	24 minutes
Interviewee 8 (male)	Ph.D. student	15 minutes
Interviewee 9 (female)	Ph.D. student	16 minutes
Interviewee 10 (female)	Ph.D. student	25 minutes

Thematic analysis, a qualitative methodology widely used in social sciences and psychology research, was employed for the analysis of the interviews, following the approach proposed by Braun and Clarke (2006). This method allows for the identification, analysis, and reporting emerging themes or patterns in the collected data, such as interviews, questionnaires, or textual information (Vergara, 2010). Thematic analysis is flexible and can be adapted to the specific needs of the research at hand (Braun & Clarke, 2006). Considering this, the dimensions of the Unified Theory of Acceptance and Use of Technology (UTAUT) model in the UTAUT 2 version developed by Venkatesh, Thong, and Xu (2012) and applied by Strzelecki (2023) were used as predefined analysis categories. It is known that the model was developed and is widely used with quantitative methods; however, in this research, it was chosen to be used to guide qualitative analysis categories (Table 2).

Table 2. Analysis categories

Category	Description
Performance expectancy	This category describes what users intend to achieve with ChatGPT, including improvements and benefits, and how this has impacted their academic life regarding productivity or performance.
Effort expectancy	This category describes whether postgraduates consider ChatGPT easy to use and whether they encountered difficulties in learning to deal with the new technology concerning academic activities.
Social influence	It aims to identify whether colleagues and professors of the interviewees use and recommend ChatGPT. Thus, it focuses on understanding the influences that have contributed to the adoption of AI.
Facilitating conditions	Assists in understanding whether ChatGPT is accessible and responsive. It explores the existence of conditions (support, infrastructure, training) that facilitate the adoption of the technology.
Hedonic motivation	It identifies whether the interviewees remain motivated to adopt ChatGPT and whether its use has brought feelings such as pleasure, enjoyment, emotional satisfaction, and pleasant experiences.
Price value	Seeks to identify whether the interviewees would pay for the use of ChatGPT if they opted for paid versions and how the availability of a free version facilitated the adoption process.
Habit	Focuses on the frequency of ChatGPT use by the interviewees, the activities they engage in, and the contexts in which they use it. The category emphasizes the influence of Habit on the adoption of ChatGPT.

Source: Adapted of Venkatesh, Thong, and Xu (2012) and Strzelecki (2023).

The UTAUT 2 is a model developed to explain the factors that influence the adoption and use of technologies. It is an evolution of the original UTAUT, incorporating additional elements. UTAUT 2 identifies seven predictors of technology use and intention to use, namely: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, and Habit (Venkatesh, Thong, & Xu, 2012). Strzelecki (2023) did not include the predictor Price Value in his research, justifying that the current use of ChatGPT is free for everyone. However, this study retained the category, aiming to analyze whether the issue of paid versions is relevant. Since this is a qualitative study, there is no impact on a structural model, as in the case of Strzelecki (2023). The following section presents the results emphasizing these categories.

4. Results and Discussion

4.1 ChatGPT in Postgraduate Studies

When asked how they used ChatGPT in their academic routines, none of the interviewed students admitted to using this resource in a literal sense, copying and pasting information: “It wasn’t a Ctrl C Ctrl V, but perfect ideas came out, which expedited the delivery” (Interviewee 1; emphasis added). Similarly, another pointed out: “I’ve never used it to write an entire paper” (Interviewee 3). On the contrary, they stated that the usage was only as an additional research source alongside others widely used in the scientific community.

I use ChatGPT more for research. So when I want to learn about a new topic, when I want some information, I go there and search because my impression is that it delivers information faster. I really don’t use it to put together presentations. I don’t use ChatGPT, for example, to summarize texts; I have never used it (Interviewee 6; emphasis added).

Interviewee 6 emphasizes the speed in getting answers to their questions as one of the reasons for using it, particularly when exploring a new topic, similar to Interviewee 8:

I haven’t used ChatGPT much; until today, it has been a few times, and every time, I used it for exploratory research to learn about something I knew nothing about. For example, in a professor’s class, he sometimes asked us to write. I read the material and watched a video, both in Portuguese and English. And when there was a term, something I did not know of, then I did exploratory research. At first, I would see what was written and what would become the results, and basically, that was it (INTERVIEWEE 8; emphasis added).

It is worth noting that the use of ChatGPT for academic research is still not a topic on which students have a consensus, as indicated by Interviewee 5: “[...] for academic consultation, I do not recommend it, nor do I use it. It is very biased; one of its problems is that it easily fantasizes, creating references” (Interviewee 5). According to him, ChatGPT’s biases can hinder understanding the study topic.

Additionally, Interviewee 4 pointed out another academic use of ChatGPT, which is the construction of programming algorithms:

I told him [ChatGPT], I have access to this and this package; I’m looking to create an algorithm that works like this; I have the data in Excel in this way; send me the R script so that I can make it work. Some individual bugs might have been my fault for not specifying, but he put together the central part for me (Interviewee 4; emphasis added).

Confirming the expertise of this tool, students have also used it for creating presentations: “What I use the most is when I’m going to do a presentation because I build presentations through programming, and it is very good for that kind of thing. For anything associated with programming, it is excellent” (Interviewee 5). Another mentioned use was for writing emails and invitations, as pointed out by Interviewee 7:

[...] Sometimes, for sending emails to professors sending emails for invitations to formal events, ChatGPT creates a template for me, and then I make adjustments. I make adaptations so that it doesn’t sound too robotic. I also use it sometimes to explain concepts to myself, and I use it to formulate sentences to improve writing as well (Interviewee 7; emphasis added).

Concludes that the use of ChatGPT in the postgraduate environment is expanding. Despite being an extremely new resource, it has already become part of the academic routine for students, whether for exploratory research, coding, presentations, or text production.

Regarding the question of whether the colleagues and professors of the interviewees are using ChatGPT, there is a consensus in the responses affirming that, in general, its use is happening among both students and faculty: “I have classmates who claim to be very adept, and some professors have openly expressed that they use it and see it as a support tool as well” (Interviewee 3). Another statement emphasizes the same: “I’ve heard people saying they use it in various ways; some students mentioned that the reviews they do for the subjects are all done in

ChatGPT” (Interviewee 7; emphasis added). Another note: “Both teachers and students are using it” (Interviewee 4).

When asked how ChatGPT has facilitated research and the production of scientific texts, Interviewee 3 stated: “When I have no idea where to start, I go there, ask for help, and it provides support.” Following the collaborative nature of ChatGPT, Interviewee 9 affirmed:

[...] It helps me organize ideas. It cuts a path. For example, if I’m going to study a new topic, it already provides me with information on specific topics I need to explore. So, instead of starting from scratch and reading all the articles, it already shows me the main topics, and then I go on to research those main topics (Interviewee 9; emphasis added).

When asked about the most significant results that the students experienced using ChatGPT in their activities and research during postgraduate studies, they indicated positive and fruitful experiences, describing them in a positive manner:

During a quantitative methods class, we discussed data analysis, and the professor mentioned the possibility of a database having a direct API [Application Programming Interface] with the system we were using. This could be useful, especially for the research I plan to develop in my master’s. ‘How am I going to find this out?’ I searched on the government’s website but couldn’t find it. I went to ChatGPT and asked how to request this API from the government. It gave me an answer, even provided the email where I should make the request. So, I think that was the most interesting; it was something that a person would spend a good amount of time trying to find a solution, and it was super quick. With one question, I solved my problem and found the way (Interviewee 3; emphasis added).

In the same vein of productivity gain and time savings, we have: “[...] combining two texts, making them converse or merging authors. Sometimes you ask for something, and it creates this intertextuality” (Interviewee 6). Notably, this involves an ethical question, as the resulting text is the work of ChatGPT and not the author. Another aspect addressed was the efficiency of ChatGPT and its multiple possibilities of use, including understanding complex theoretical perspectives.

I started (researching) with Marx, as I had already read more about him during my undergraduate studies. However, since I wanted to work with Foucault and hadn’t read as much of his work, I moved on to him shortly afterward. But I started with complex questions, needing to relate the theory to my practical question, and right from the start, it came very aligned, which was very interesting. It stood out greatly from Google (Interviewee 1; emphasis added).

Simplification of some concepts, so I don’t have to write down some concepts. I can give the authors, and from this theoretical cluster, it can synthesize what they were talking about. This helps a lot because, for example, there are more than thirty scales in the literature I’m using. Usually, for each scale, I would need to conceptualize it, which would take me a lot of time. I already know who created the scale; I’ve read the works, but I would have to redo it in my own words. So, the chat is helping me in this sense to make this cross-reference faster. Later, I check if everything is correct and grammatically correct, and I put it in a more human language because sometimes it’s too robotic (Interviewee 4; emphasis added).

This indicates that by automating repetitive and problematic tasks, ChatGPT has the potential to assist researchers in facilitating data collection, literature review, and information synthesis. However, in opposition, there are:

[...] When you ask him to do something, even if you’ve given him all the input text, there’s a chance he might want to take a detour or change the meaning or not do exactly what you want; there’s a chance, and that is a criticism you can make of academia, right? In the sense that it’s very easy to plagiarize through it. (Interviewee 5; emphasis added).

To be quite honest, I see it with some concern. Because it is so facilitating that it can make researchers lazy, for example, I use it very little in my research. In fact, I used it to see which articles there were on a topic, right? And, in fact, it returned results to me that were not reliable. But I think the academic research process needs to be a bit more proactive; it’s not more proactive if you simply seek ready-made results. (Interviewee 10; emphasis added).

Regarding plagiarism, Interviewee 1 asked: “No. Plagiarize from whom? Where did the base come from?” (Interviewee 1). Other interviewees consider that using ChatGPT in scientific work can be considered academic plagiarism, depending on how it is employed. “Yeah, I think so; I believe it can be considered; it depends a lot on how it is used, right?” (Interviewee 6). However, one interviewee believes that if no one claims it is academic

plagiarism, then it isn't: "I think that if no one says it's not, it's not plagiarism; if no one says it's academic plagiarism, I consider that it's not. I'm the type that if no one says this is plagiarism, then it's fine. We have no rules about it" (Interviewee 7). This plagiarism issue is still open and has not been widely discussed in postgraduate programs. However, it already appears in various texts as a fundamental issue (Rossoni, 2022; Malinka et al., 2023; Byrne, 2023; Velásquez, 2023; Strzelecki, 2023).

Interviewee 8 also takes a highly critical stance toward the use of ChatGPT in academia: "I don't really use it for work because I find it very limited. I think it has to do with the passive culture we are developing, where the researcher is in front of the computer a lot" (Interviewee 8). He adds:

I think that's his modus operandi, to give you inaccurate information and according to the great neoliberal ideology because it is part of a big company, just like social networks. People think there is democracy on social networks, everyone can think whatever they want here (Interviewee 8; emphasis added).

In this regard, Maciel (2023) warns that using AI, such as ChatGPT, may lead to undesired effects, such as the generation of misinformation, dissemination of fake news, and even promotion of plagiarism. Therefore, the technology may provide harmful instructions. Farias (2023, p. 81) also states that "[...] AI does not replace human academic writing. The academic is still responsible for the data's accuracy and the content's originality".

The lack of consensus among the interviewees' opinions regarding using a technological tool in scientific writing reveals the diversity of perspectives and experiences in the scientific field. This need for more agreement also highlights the challenges in adopting new technologies in this context (Strzelecki, 2023). At some point, scientific institutions must adopt clear rules and procedures regarding ChatGPT and other AIs (Sullivan, Kelly, & McLaughlan, 2023).

4.2 The Acceptance and Use of ChatGPT in Postgraduate Studies

4.2.1 AI Performance Expectation

This category allows us to understand users' intentions when using ChatGPT, including the improvements and benefits they seek with its use, i.e., how individuals expect ChatGPT to enhance their performance in carrying out academic tasks or goals (Venkatesh, Thong, & Xu, 2012; Strzelecki, 2023). Thus, during the interviews with the research participants, they were asked if ChatGPT improved or facilitated their experiences with graduate activities. In his study, Strzelecki (2023) showed that students are more likely to adopt ChatGPT when they have high expectations regarding its performance.

Overall, the responses were positive, especially in terms of better time management, for example: "[...] it made things a bit faster. Nowadays, many specific things, simpler questions, I know I can throw them there, and I will get the answer" (Interviewee 4). Interviewee 1 also confirmed: "[...] it improved a lot, I made a much faster delivery than I expected. We don't suffer in advance. Depending on the stage you're at, ChatGPT ends up improving even mental health" (Interviewee 1). According to the respondents' answers, ChatGPT was considered a helpful tool for simple questions, specific doubts, formulating questions for exams, programming code, creating slides, among others. In addition to saving time, it is noted that it can reduce the pressure of accumulating academic deliveries, allowing mental relief for students.

Based on Gordijn and Have (2023) and their text on the aspects of the evolution or revolution of ChatGPT, it was noted that respondents are experiencing a learning moment: AI is seen as a support tool. However, it is not yet a revolution in academic routine:

The part about productivity gains in creating materials, slides, and such was very useful, but it wasn't a big revolution in my life. It's not something I wouldn't do otherwise or couldn't do. It's more of a tool, another option, something else I can use to assist in my life. But it's not something that revolutionized. So, it facilitated some activities to make them a bit less burdensome, but on the other hand, if it weren't for it, they would still be done anyway (Interviewee 5; emphasis added).

Participants were also asked whether they expect ChatGPT to assist them in obtaining more precise and reliable answers to their questions. The respondents were divided into two groups. The first group believes in the continuous learning of artificial intelligence and the developmental journey the tool has ahead: "[...] As I use it, it identifies patterns, themes that I usually research, so due to this improvement, it can also refine itself to get even closer to what I'm researching" (Interviewee 2). Interviewee 6 indicated something similar: "[...] I think the program is still very much in the beginning; certainly, they will be able to extend the way the chat finds information. So this will generate more precision. Moreover, maybe even reliability, perhaps in the future, the sources will become clearer".

The second group still remains cautious regarding the accuracy, reliability, and type of results that AI can provide: “Today, I don’t trust it much. I trust it while being suspicious. If I get a result there, I’ll check if the information is correct, but who knows in the future, right?” (INTERVIEWEE 10). Interviewee 3 stated something similar: “[...] I won’t trust it 100%, especially in research. I won’t take that as certain; I’ll check, I’ll look for other forms of validation” (INTERVIEWEE 3). Consistent with this, Quintans-Júnior et al. (2023) indicate the need for caution and rationality when using ChatGPT in the scientific field.

Such observations by the participants support Velásquez’s study (2023). For him, it is evident that tools like ChatGPT can potentially change how a series of tasks are performed; however, the full extent of this impact is still unknown. Nevertheless, other authors indicate more incisively that the impact will be significant: “science is about to be transformed once and for all by artificial intelligence” (Rossoni, 2002, p. 402).

4.2.2 Effort Expectancy in Utilizing ChatGPT

This category allows us to understand if postgraduates consider ChatGPT easy to use and if they found it easy to learn how to deal with this new technology, that is if its use is effortless (Venkatesh; Thong, & Xu, 2012). Strzelecki (2023) found in his study in Poland that students feel comfortable adopting ChatGPT.

All the master’s and doctoral students who participated in the interview quickly learned to use ChatGPT. The most used adjectives in this description were “practical”, “functional”, “calm”, and “intuitive”, which allows us to conclude that the effort required in use is low, as in some responses: “[...] you enter the site, it’s all online, it’s convenient, very functional and very calm” (Interviewee 1); “[...] I find the platform very intuitive. There’s no secret. It’s very user-friendly” (Interviewee 3), and “[...] I found it very intuitive. You basically ask, and it gives you the answers, so I had no difficulty” (Interviewee 6).

However, one point observed is the importance of asking the most appropriate questions. Giray (2023) highlights the importance of the prompt, that is, the specific instruction or query you provide to ChatGPT to generate the desired outputs. Interviewee 5 mentioned this:

So, I didn’t have difficulty because these tools all work the same way for me, which is this thing of minimal effort. Sometimes you have difficulty finding words to give you the result you want, but then it’s more of a problem on your part than with the tool itself (Interviewee 5; emphasis added).

The reservation related to the type of activity performed with AI persisted: “As exploratory research, yes, but only as exploratory research” (Interviewee 8). This indicates that, although easy to use, some students are limiting their use to more specific activities. The literature also suggests that the uses are still limited. According to Farias (2023), the most common uses in academia are text searches, reviews, and improvement in writing.

4.2.3 Social Influence in the Use of ChatGPT

Social influence refers to the individual’s perception that essential people to them think they should use a technology (Venkatesh; Thong, & Xu, 2012). Strzelecki (2023) found in his research that social influence in the case of ChatGPT was low since it is still a new technology and has yet to gain widespread adoption, and there is no pressure to use it. Here, we analyze whether the colleagues and professors of the interviewees use or recommend ChatGPT, aiming to understand the influences that contributed to its adoption. The majority of the interviewees have received suggestions or recommendations from other students or professors in the graduate program to use ChatGPT:

I have already received from my colleagues, right? I think one of the first times I saw someone using it was a professor in class. Then he asked the chat to use formulas, questions, proposals, schemes, some structure of a scientific article, or something like that, and the chat did it. (Interviewee 6; emphasis added).

Usually, the recommendation comes in a cautious way, as a suggestion for something new, which demonstrates great utility, high potential, but is not yet a breakthrough in the way research is done, or a revolution in academia, much less a requirement. According to the interviewees, the recommendation comes as a new tool that deserves to be known, due to its current popularity and its potential: “Someone speaking imperatively, use it, I’s worth it, no, but I’ve heard professors saying that students should use it to make the tool familiar. Advising to use and discover for sure, both from professors and colleagues” (Interviewee 1).

There was a difference of opinions among professors in the postgraduate program in Administration. There are those who criticize or ignore, as well as those who encourage and show its positive points.

Some professors here have already said that this is nonsense, that it’s lazy work, and you’re too lazy to think. Other professors go beyond that and say that the problem with these tools is that they give you myopia of concepts; they don’t deepen. Moreover, some people commented that they had recommended it.

(Interviewee 4; emphasis added).

I don't know, but one day in a presentation, I said that I use it, and I felt people's facial expressions like, 'Wow, you're saying that you use it'. Unfortunately, in Brazil, as we have so many cases of unethical behavior, I think that when we say that we use ChatGPT, most people already come with the prejudice that you are using it to copy and paste reviews. (Interviewee 9; emphasis added).

Some students stated that due to fear, they haven't recommended ChatGPT to other colleagues in the Postgraduate Program.

No, also because of the prejudice that some people have. I also believe that depending on the person's intention, the chat can be used for things that are not good. So, I try not to recommend it because I think it's delicate. I would only recommend it, perhaps, to people closer to me, but that has never happened. (Interviewee 2; emphasis added).

Another topic addressed during the interviews was whether the interviewees had discussed the use of AIs with their advisors and their opinions regarding their use in the context of postgraduate studies. Most stated that they had not yet discussed this topic. Only 4 of the 10 interviewees claimed to have talked to their advisors about this use. The results indicate cautious use of this technology: "He [an advisor] finds it interesting but said that one must be careful because ChatGPT has to be seen as a tool; it is a means to an end. He thinks that artificial intelligence will expedite things, but it is not made to think for you" (Interviewee 4). Following the same positioning line: "I did talk to her [advisor], yes, we have a similar opinion. We look with a lot of distrust and reservation at this tool" (Interviewee 8). On the other hand, advisors were identified who indicate the use more directly: "I discovered ChatGPT in my advisor's class. He talked about AI and how we can use it to facilitate our academic life and gave us this recommendation" (Interviewee 9).

Although it is known that ChatGPT is on the rise, certain research lines within the Administration use it less than others: "I believe that there will be barriers in some areas depending on the line and the researcher because depending on the area you are working in, you have a notion of work that starts a lot from the human being" (Interviewee 1). Therefore, adoption also depends on the relationship with the advisor and the research line.

In general, all the interviewees have colleagues or professors who use ChatGPT in some of their postgraduate activities, demonstrating its social influence in this environment and confirming the analysis of research trends on Google. However, this influence is still relative, as Strzelecki (2023) found, given that many adopt it silently (without indicating where or how it was used), and there is no widespread pressure for adoption.

4.2.4 Facilitating conditions for the use of AI

In this category, it is essential to understand the accessibility and responsiveness of ChatGPT, as well as to investigate the existence of favorable conditions (such as support, infrastructure, and training) that facilitate the adoption of this technology (Strzelecki, 2023). All interview participants confirmed the ease of accessing ChatGPT. One of the interviewees watched a video to check if they needed to download any application but quickly realized it was a website, signed up, and started using it: "I watched a video just to know if I needed to download anything or not, but then I found out it was a website, that was it" (Interviewee 1). The existence of videos and texts that assist in usage confirms the facilitating conditions of the AI.

Another participant accessed it for the first time via mobile and used the Google account to access the AI more quickly:

It was right at the beginning out of curiosity. A brother-in-law who likes technology mentioned ChatGPT. So, I entered through my phone with that Google account, didn't even create an account, and we started playing, asking questions to the chat, let's see if it's really intelligent, more like a joke (Interviewee 3; emphasis added).

In general, everyone accessed it easily. Regarding the devices used, none of the interviewees used ChatGPT on tablets; overall, everyone prefers computers: "I've used it on the computer and on the phone. I don't like to use any research tool or statistical tool on my phone. I like to use it on the computer for visual, space, and comfort reasons" (Interviewee 4).

Strzelecki (2023) also found in his study that ChatGPT has facilitating conditions for use. It is evident that, due to its model, it is possible to ask how to optimize its use, create prompts, and ask questions – its own artificial intelligence functions as a support available 24 hours a day.

4.2.5 Hedonic motivations for using ChatGPT

This category allows us to identify whether the interviewees have maintained their motivation to use ChatGPT

over time, as well as exploring whether the use of the technology has brought feelings of pleasure, fun, and satisfaction (Venkatesh; Thong; Xu, 2012; Strzelecki, 2023). The interviewees described ChatGPT as an interesting and fun tool. Interviewee 3 indicated that when she started using it, it was like “playing with asking questions”. AI is portrayed as something novel with various interesting possibilities. One interviewee mentions that it’s enjoyable to use, while another emphasizes that the program always surprises him, providing an exciting and unpredictable experience.

How did they manage to create a program that responds almost like a human being? It seems like the possibilities of reactions from the program are almost as vast as those of a human, so it always surprises me, so it’s a bit fun in that sense (Interviewee 6; emphasis added).

When it comes to feeling excited and motivated while using ChatGPT, the interviewees’ responses indicate a variety of perceptions.

I think it motivates in the sense of it being helpful, friendly, bringing results that make life easier, saving me time, making things more objective, and that motivates me to keep using and consulting. And it’s a free tool, at least for now (Interviewee 3; emphasis added).

Other interviewees stated they feel excited or motivated when using ChatGPT because of its interface and curiosity about AI. It is relevant to note that the consumption of technologies is influenced by subjective and symbolic elements such as positive feelings and a sense of belonging to a group adopting new technologies (Arnould & Thompson, 2005). Similarly, Strzelecki (2023) identified that students find ChatGPT enjoyable and fun (due to the dialogue-based interface).

4.2.6 Perceived Value of the Price of ChatGPT

This category was used to identify whether the interviewees would be willing to pay for the use of ChatGPT if they opted for paid versions and how the availability of a free version facilitated the adoption process of the technology. As already mentioned, Strzelecki (2023) waived this predictor in his study.

The interviewees’ responses reveal divergent opinions regarding the willingness to pay for access to ChatGPT if all its versions became paid. Some factors mentioned by the interviewees include the price, the availability of free access from third parties, and the perceived utility of the tool. One of the interviewees expressed that, considering the limited financial situation due to the master’s scholarship, it would be difficult to pay.

It would depend on the price. A master’s scholarship doesn’t allow much beyond living somewhere shared and eating. Maybe I wouldn’t pay, because if you stop to think rationally, the master’s scholarship doesn’t even entitle me to pay for health insurance, so paying for ChatGPT is very difficult (Interviewee 1; emphasis added).

Some interviewees responded about the possibility of paying, depending on the price and effectiveness of the tool: “Yes, depending on the price. If it were affordable, I would pay” (Interviewee 9). On the other hand, some interviewees stated that they would not pay because they believe the free version already meets their needs: “No, because the free one meets my needs, but even if it were paid, I wouldn’t use it” (Interviewee 7).

Other interviewees haven’t considered purchasing, mainly because they are not familiar with the paid version or believe that the free version already serves them well: “I’ll be very honest, I didn’t even know there was a plus version. No, today I wouldn’t think about paying because the version they have there meets my needs” (Interviewee 3). One interviewee mentioned that they paid for only one month of the beta version of ChatGPT and would be willing to pay if they were financially able: “I paid only one month for the beta version, but I would pay, yes. I’m a big fan. If I could afford these things, I would definitely pay” (Interviewee 5).

The responses reveal different perspectives regarding the interest in having ChatGPT Plus, the paid version of ChatGPT for USD 20 per month (at the moment). One reason mentioned is that the accessible version of ChatGPT already meets their needs. They assert that the features available in the free version are sufficient for them.

4.2.7 Habit of using ChatGPT

The focus of this category was to understand the influence of Habit on the adoption of ChatGPT by the interviewees (Strzelecki, 2023). The interviewees’ responses reveal the frequency of using ChatGPT in academic activities. Some interviewees mentioned that they use it with low frequency, either occasionally or only once a week: “Sometimes, today I have used it little. [...] Today, biweekly” (Interviewee 2). These interviewees indicate that their academic needs do not require frequent use of AI.

On the other hand, some report more frequent use in their academic activities: “I use it a lot now that I am

writing the theoretical framework of my thesis. I believe I use it 2 to 3 times a week” (Interviewee 4). One uses ChatGPT practically every day: “Every time I’m going to do an academic activity, practically daily” (Interviewee 9). The interviewees’ responses reflect their perceptions of using ChatGPT as a habit and whether they plan to continue using it.

I think it will become a habit for everyone. The big question is whether it will make us lazier and how it will affect our subjective constitution. But I believe it will become part of the lives of everyone who has access to the internet (Interviewee 1; emphasis added).

The majority of the interviewees view the use of ChatGPT as a habit. Some state that it has recently become a routine in their lives, and they use it frequently: “[...] it’s part of my routine” (Interviewee 4). Expanding on this matter, the interviewees reveal different perspectives on the role of ChatGPT in the future of academic research in the field of Administration.

[...] In terms of Administration, being a more functional, managerial area that deals with processes like strategy, decision-making, and the like, I think that soon it will be practically hegemonic. The use of ChatGPT will be almost in every area. However, depending on the issue, if it’s more Marxist or rooted in organizational studies, the use may be lower (Interviewee 1; emphasis added).

Regarding other AIs, the majority stated that as ChatGPT has met their needs so far, they have never turned to other tools. However, they are open to exploring other options if they perceive limitations in ChatGPT. Most interviewees did not use any AI tools in their academic activities before ChatGPT, as mentioned by Interviewee 9: “No, ChatGPT was the first.” For most of them, ChatGPT was the first and only AI tool they have experienced to date.

5. Final Considerations

The research conducted with postgraduate students suggests that the use of ChatGPT in the academic environment is growing, encompassing various activities such as exploratory research, programming, presentation development, and email writing. Students often use ChatGPT as a research source alongside other traditional tools. However, there was disagreement regarding the use of ChatGPT in producing scientific texts, with divergent opinions on its effectiveness and limitations. Some students were critical and hesitant about its use in postgraduate studies. In seeking participants for this study, some refused to participate due to never having used this tool and expressed criticism towards those who did.

Regarding the categories, the synthesis is that the adoption and use of ChatGPT by postgraduate students in a Business Administration program were influenced by various factors. Students seek to improve their academic performance, increase productivity, save time, and reduce the effort in searching for references and structuring texts. They found ChatGPT easy to use and were influenced by peers and professors who recommended cautious use. Most interviewees were motivated to use the tool because it provided an enjoyable experience. The availability of a free version of ChatGPT was an essential element in its dissemination, and its use became a habit for many of the interviewees, who believe that its use will become increasingly frequent and common.

The study mapped concerns about the potential spread of misinformation and the risk of academic plagiarism. The lack of consensus among the interviewees reveals the diversity of perspectives and experiences in using this technological tool. In this scenario, postgraduate programs and scientific events must bring this issue to their discussion agenda. Moreover, there is a need to “develop policies and regulations that encourage its use” (Velásquez, 2023, p. 04). However, until now, the postgraduate program where the research was conducted – and many other programs and events in the field of Business Administration – have not demonstrated the necessary attention to using artificial intelligence in the scientific field. Quintans-Júnior et al. (2023, p. 02) pose relevant questions that need to be addressed very soon: “Who would be in charge of regulating the use of chatbots in science, and how would this be accomplished?” and others.

The findings, especially within technology assimilation in academia, are relevant to educational policymakers and practitioners. The research conducted with postgraduate students provides valuable insights into the evolving landscape of AI integration in academic settings. The growing utilization of ChatGPT across various academic activities underscores the need for policymakers to stay informed about emerging technologies and their impact on educational practices. The diverse opinions on the effectiveness of ChatGPT in scientific text production and the identified concerns about misinformation and plagiarism highlight the complexity of integrating AI tools into scholarly work. Educational practitioners should be aware of these nuanced perspectives to guide students effectively. Additionally, the study’s emphasis on the lack of attention to AI in scientific fields calls for a reevaluation of educational programs to incorporate discussions and policies around responsible AI use. These

findings underscore the importance of proactive engagement with AI technologies in academia and the necessity for informed decision-making among educational stakeholders.

The study provides valuable insights for educators considering the integration of artificial intelligence, particularly ChatGPT, into academic routines. Graduate students have already incorporated ChatGPT into diverse activities, indicating opportunities for optimizing pedagogical practices. The technology's potential to expedite research, provide quick information, and aid in presentation creation can enhance academic activities. Despite benefits, educators must address concerns about potential plagiarism-prone practices, working collaboratively with other academic stakeholders in defining clear rules for its ethical use. The study underscores the importance of discussing and establishing rules for artificial intelligence in academic production, with educators playing a crucial role in fostering awareness and responsible practices among students.

The research emphasizes the significance of engaging in discussions and actively participating in the establishment of guidelines for the ethical use of artificial intelligence in academic production. Educators are positioned as pivotal contributors, playing a vital role in cultivating awareness and promoting responsible practices among students in the context of AI integration in academic settings.

As for limitations, it is mentioned that the research had a small number of participants, which could limit the representativeness of the responses regarding using ChatGPT in postgraduate studies. Another limitation is the life stage of ChatGPT; in a short period, its accuracy, biases, and reliability can change due to continuous machine learning, making the results of this research applicable for a limited period. Finally, another limitation is the lack of discussion on factors influencing the authors' perceptions, such as undergraduate or master's (for Ph.D. candidates) education, age, paradigms, and theories used in research and research focus. There were indications that adoption or rejection might be influenced by different research lines and theories mobilized in studies.

The above limitations can be leveraged in a research agenda. In addition to them, new research related to the use of ChatGPT in organizations other than educational ones, such as private companies or the public sector, is suggested to identify other ways of using it and different adoption processes. Research involving undergraduate students and teachers (from different courses) is recommended for educational institutions. These studies can apply the UTAUT 2 with a representative sample and use structural equation modeling as a data analysis method or invest in other qualitative methods. Finally, mapping and describing the controversies identified regarding biases, limitations, plagiarism, and other ethical topics is a productive and necessary future research agenda related to ChatGPT and other AIs.

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Appendix A

1. In general, how have you been using ChatGPT in your postgraduate academic work (building presentations, summarizing texts, querying questions, organizing or writing articles, collecting data, writing emails, etc.)?
2. Do you have colleagues and professors who use ChatGPT in their postgraduate activities?
3. What were the most interesting results you obtained using ChatGPT in your postgraduate activities?
4. Have you discussed AI in academic life with your advisor? What is their opinion on its use in postgraduate activities?
5. Do you believe AIs are capable of providing more accurate results than traditional methods of search and research? Why?
6. Has ChatGPT improved and facilitated your experience with postgraduate school activities?
7. Do you expect ChatGPT to help you obtain more precise and reliable answers to your questions?
8. Did you find it easy to learn how to use ChatGPT?
9. Do you think using ChatGPT saves you time and effort compared to other tools?
10. Have you received suggestions or recommendations from other students or professors to use ChatGPT?
11. Have you recommended ChatGPT to your master's, doctoral peers, or professors?
12. Have you had easy access to ChatGPT?
13. Is ChatGPT easy to use on your devices (such as computer, smartphone and tablet)?
14. Do you find ChatGPT fun or interesting to use?
15. Do you feel excited or motivated when using ChatGPT?
16. Would you be willing to pay to have access to ChatGPT if all its versions were to become paid?
17. Do you currently have or have you considered having ChatGPT Plus (USD \$20/mo)?
18. How often do you use ChatGPT in your academic activities?
19. Do you believe using ChatGPT has become a habit for you? In addition, do you plan to continue using it?
20. Did you use any AI tool in your academic activities before ChatGPT?
21. How do you deal with the possibility that ChatGPT may generate inaccurate or biased information for your research?
22. Do you consider the use of ChatGPT in scientific work to be academic plagiarism?
23. What do you consider the main ethical issues involving the use of ChatGPT in your postgraduate activities?

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