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Ethics and biases in the use of ChatGPT for academic research

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Abstract

This study investigates the ethical considerations and biases in the use of ChatGPT for academic research, focusing on its acceptance, perceived usefulness and the impact on intentions for future use among university students. A quantitative approach was used, collecting data from 5,000 participants at 20 universities. The relationships between key variables were analysed using structural equation modelling (SEM) with SmartPLS, and reliability and validity were assessed using Cronbach's alpha and AVE. The results revealed that ease of use (coefficient = 0.389, $p < 0.05$) and content reliability (coefficient = 0.530, $p < 0.01$) have positive and significant effects on the intention for future use of ChatGPT. However, ethical considerations (coefficient = -0.047, $p > 0.05$) and perceived impartiality (coefficient = 0.120, $p > 0.05$) did not show significant influence. Furthermore, the acceptance of ChatGPT significantly impacts academic research (coefficient = 0.936, $p < 0.001$). It is concluded that ChatGPT offers significant benefits for academic research, such as improved efficiency and productivity, but its adoption must be accompanied by ethical guidelines to mitigate risks related to authorship and originality. Regarding practical implications, higher education institutions should establish clear policies and training programmes to promote the responsible and ethical use of artificial intelligence tools such as ChatGPT. These measures will ensure that students can take advantage of these technologies effectively without compromising academic integrity.

Keywords: Artificial intelligence, Educational technology, Ethics, Research, Learning, Responsibility (Education).

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1. Introduction

The advance of artificial intelligence (AI) in higher education has marked a turning point in the way students and academics approach learning and research processes. This phenomenon has been widely documented by educational and scientific organisations. According to the Educause Review [1] more than 65% of universities worldwide have integrated AI tools into their educational systems, reflecting the growing relevance of these technologies in the transformation of the academic environment [2, 3]. Among the most prominent tools is ChatGPT, a language model developed by OpenAI, which has demonstrated an outstanding ability to generate coherent, high-quality textual content [4]. This model has been widely adopted in tasks related to academic writing, data analysis and the synthesis of complex information, as pointed out by Hamadneh, et al. [5]. The widespread use of ChatGPT, however, has exposed significant gaps in the academic field, which require rigorous análisis [6]. One of the most critical gaps is the lack of specific ethical guidelines to regulate its use in educational contexts. According to the Council for Higher Education Accreditation [7] 39% of educational institutions lacked explicit policies on the use of AI tools, which allowed students to present texts generated by these technologies as if they were their own, compromising academic integrity and transparency in the production of knowledge. This problem has become a central challenge for universities, undermining one of the fundamental principles of higher education: academic honesty [8, 9]. At the same time, the impact of the excessive use of tools such as ChatGPT on the development of critical and analytical skills has generated concern among experts and educators. According to Noain-Sánchez [10] the use of AI-based technologies poses significant challenges in terms of how students develop critical thinking skills and solve complex problems. A study by the Pew Research Center [11] revealed that 58% of students who used ChatGPT for academic tasks significantly reduced their participation in activities that encourage critical reasoning, such as manual research and comparative analysis of information [12]. This data shows that the inappropriate use of these tools not only affects the quality of learning, but also compromises students' ability to solve complex problems and make informed decisions, essential skills in the academic and professional fields [13, 14]. In addition, another fundamental gap identified is related to the biases inherent in AI models [15]. A report by the Institute of Electrical and Electronics Engineers (IEEE) [16] noted that 42% of AI-generated texts, including those produced by ChatGPT, exhibited some degree of bias. As argued by Wu, et al. [9] these biases stemmed mainly from the data used to train the models, which often reflect cultural, social and gender biases [16, 17]. In the academic sphere, this bias compromises objectivity and diversity in the generation of knowledge, which can perpetuate inequalities and reinforce stereotypes instead of promoting inclusive and equitable education [18]. Based on the above, the objective of this study was to address these issues through a comprehensive analysis. To this end, three key steps were taken: First, a systematic review of the academic literature was carried out to identify the main gaps and ethical challenges associated with the use of ChatGPT; second, a conceptual framework was designed to assess the implications of these technologies on academic integrity and the development of critical skills; and third, empirical data was collected through surveys applied to a representative sample of students and academics from international universities, with the purpose of analysing in detail the impact of ChatGPT on the educational environment [19, 20]. The aim of this study is to: Determine whether there are ethical aspects and biases in the use of ChatGPT for academic research.

2. Literature Review

In recent years, the use of artificial intelligence (AI) in educational environments, especially at university level, has generated growing interest in the ethical implications and possible algorithmic biases in tools such as ChatGPT. Cain, et al. [21] discuss how technology influences leadership and decision-making within organisations, providing key elements for understanding the impact of AI on educational management. This relationship between technology and ethical leadership extends to the use of tools such as ChatGPT in higher education, where students turn to these platforms to produce their academic work, facing similar ethical challenges related to originality and academic integrity.

Huang, et al. [22] analysed trust and leadership in conflict management in academic contexts, which can be extrapolated to the university environment, where educators face the challenge of managing the ethical use of technology by students. In this sense, the trust between students and teachers is put to the test when using tools such as ChatGPT, which, while facilitating the production of academic texts, also generate ethical dilemmas related to authorship and the quality of the work.

The acceptance of technological tools such as ChatGPT in academic environments improves the research process by providing quick and organised access to relevant information [23]. Based on the Technology Acceptance Model (TAM), when students perceive ChatGPT as useful and easy to use, this drives its adoption and use in academic research, increasing both the efficiency and quality in the production of scientific work [24]. Previous research confirms that the acceptance of AI technologies is directly related to improvements in the structuring and development of ideas, as well as to greater productivity in the creation of academic content [25].

Hypothesis 1: Acceptance of the use of ChatGPT has a significant positive relationship with academic research.

Similarly, Liu, et al. [26] investigated inclusive leadership in education, an approach that connects with the analysis of the algorithmic biases present in ChatGPT, which impact on equity in knowledge production and on the fair representation of diverse perspectives in research work. In terms of academic and ethical quality, Hussain and Ahmad [27] examined transformational leadership in higher education, highlighting how ethical leadership can influence decision-making in educational contexts. Within the university context, this concept relates to the ethical responsibility of students and teachers in the use of ChatGPT, since the misuse of these tools could compromise the quality of research work and, consequently, academic integrity.

Birks and Clare [28] addressed decision-making in higher education institutions, but their analysis of how technology influences decision-making processes can be related to the decisions made by university students when they resort to AI to

carry out their research. Similarly, De Leon, et al. [29] studied the integration of AI in academic libraries, offering a useful framework for understanding how students decide to use ChatGPT in their work, considering perceived accessibility and benefits, but also ethical risks.

Regarding the challenges associated with ethics and quality in the university environment, Kong, et al. [30] discussed the importance of leadership skills in the management of educational technologies, highlighting the need for teachers to guide the ethical use of ChatGPT in student research. This approach is relevant for monitoring how students use ChatGPT in their research, ensuring that the principles of authorship and originality are respected in their academic work. Similarly, Ghio [31] emphasised the importance of ethical training in university environments, which has a clear connection with the management of the use of AI such as ChatGPT in the preparation of academic research.

Pereira, et al. [32] examined the quality of services in educational environments, which is related to academic quality in the university environment. The use of ChatGPT to produce academic work raises questions about whether the quality of AI-generated content is equivalent to the original work produced by students and how these works are evaluated in terms of rigour and depth.

The relationship between technology and ethics in university education has been explored in several recent studies, highlighting the challenges that the use of artificial intelligence presents for academic integrity. Li and Coates [33] found that ethical leadership is key to managing complex situations, such as those faced by educators when supervising the use of technologies such as ChatGPT in the preparation of research papers. Similarly, Nguyen and Goto [34] emphasised the importance of ethical leadership in higher education, ensuring that students use AI responsibly without compromising the principles of authorship and originality. Furthermore, Tamanna and Sinha [35] indicated that the use of technology improves student satisfaction but warned of the need to monitor its use to prevent tools such as ChatGPT from affecting the quality of learning and the development of critical skills.

On the other hand, Nikolic, et al. [36] analysed transformational leadership in educational contexts, emphasising the need to guide students towards ethical practices in academic production. This idea is related to academic authorship, a recurring challenge when using artificial intelligence technologies such as ChatGPT, which can raise questions about the originality of the work. In line with this, Fathi and Rahimi [37] pointed out that the leaders of higher education institutions must establish clear guidelines for the use of advanced technologies, minimising algorithmic biases that can influence the impartiality of research. Similarly, Segbenya, et al. [38] addressed inclusive leadership in the university context, highlighting how biases in algorithms can generate inequalities in research results, posing a risk to academic equity.

The impact of AI tools such as ChatGPT has also been discussed from the perspective of academic quality and principles of intellectual responsibility. Al-Mamary, et al. [39] found that transformational leadership is fundamental to promoting ethical responsibility within organisations, which is directly applicable to the supervision of students who use AI in their research. Lestari, et al. [40] also discussed how technology can influence decision-making, suggesting that teachers should encourage ethically based decisions to ensure that the use of ChatGPT does not compromise academic integrity.

Studies on educational technology have shown that the more intuitive and accessible a tool is, the more likely students are to want to integrate it into their future activities, thus increasing its sustained adoption [41]. This relationship ensures that an accessible design of ChatGPT not only optimises learning, but also promotes its long-term retention as an academic support resource.

Hypothesis 2: The ease of use of ChatGPT has a significant positive relationship with the intention of future use.

For their part, Kalbande, et al. [42] analysed the impact of technological dependence on academic practices, which is related to the academic conditions in which university students resort to tools such as ChatGPT. It is important to assess whether the use of these tools improves the quality of research work or, on the contrary, generates technological dependence, negatively affecting the development of autonomous research skills.

3. Theoretical Framework

Artificial intelligence (AI) refers to the ability of machines to perform tasks that traditionally require human intelligence, such as information processing, problem solving and decision making [43]. In the field of education and research, AI has been widely adopted to optimise processes such as information retrieval, data analysis and content generation. This technology has the potential to revolutionise the way academic knowledge is developed, although it also poses significant challenges, including algorithmic biases and ethical implications, particularly with tools such as ChatGPT [18, 19]. In addition, the ethical dimension of using ChatGPT must be considered, as adherence to ethical principles generates trust and a sense of responsibility among users. Studies indicate that when students perceive a tool as being aligned with ethical standards, they are more likely to adopt it in a sustainable way, integrating it as a reliable resource in their academic research [20].

Hypothesis 3: Ethical considerations in the use of ChatGPT have a significant positive relationship with the intention of future use.

Language models are AI systems designed to process, understand and generate text based on large data sets. These models use deep neural networks to predict the most likely sequence of words, enabling them to produce coherent texts in a variety of contexts [21, 22]. Among the most advanced models is ChatGPT, which has been trained with extensive textual corpora to generate content that emulates human language. However, language models are not perfect; they can reflect biases present in the training data and generate texts that, although grammatically correct, are not always accurate or ethical in academic terms [35].

ChatGPT is an advanced language model developed by OpenAI that uses natural language processing (NLP) techniques to generate text automatically. ChatGPT has been trained with large volumes of textual data, enabling it to write

coherent texts, summarise content and answer questions in a conversational manner [23]. In the academic context, ChatGPT has been used to support research tasks such as idea generation, drafting and text structuring [25]. However, its use presents ethical and technical challenges. Texts generated by ChatGPT can exhibit algorithmic biases, and their use raises questions about intellectual authorship and academic originality, given that AI-generated content may not reflect the original contribution of the researcher or student [41].

Algorithmic biases refer to distortions or prejudices that emerge in the results generated by AI systems due to the nature of the data used for their training [44]. In the case of language models such as ChatGPT, biases arise when the algorithm replicates patterns present in the data set, which can lead to the production of texts that reinforce stereotypes or present a partial view of reality [11]. These biases can be cultural, racial, gender-related or associated with other contextual factors.

In academic research, algorithmic biases represent a significant risk, as they compromise the objectivity and neutrality expected in academic work [13]. Therefore, if a researcher uses ChatGPT to produce an academic paper without being aware of the biases inherent in the model, the result may reflect unbalanced or biased views. This affects the quality of the research and, ultimately, its integrity. Identifying and mitigating these biases is crucial to ensure the responsible and ethical use of AI in academia [14]. Furthermore, when students perceive ChatGPT as a useful tool and consider continuing to use it, their level of acceptance increases, integrating it more solidly into their learning and research processes. Previous studies indicate that a sustained intention to use strengthens the positive evaluation and active integration of technological tools in academic environments [15, 16].

Hypothesis 4: The intention to use ChatGPT in the future has a significant positive relationship with the acceptance of its use.

Academic ethics are a set of principles that govern the behaviour of academics and researchers in the production of knowledge [27]. These principles are based on fundamental values such as honesty, integrity, transparency and respect for copyright. In the context of AI-assisted research, such as the use of ChatGPT, academic ethics are particularly relevant, as they raise challenges related to authorship, originality and responsibility in the creation of academic work [28].

One of the main ethical issues that arises is the risk of students or researchers delegating cognitive tasks to ChatGPT excessively, thus compromising their ability to generate original knowledge and actively participate in the research process [31]. Furthermore, the lack of clarity about the degree of AI involvement in the writing of a paper raises doubts about the authenticity of the final product. Therefore, it is essential to adopt clear guidelines to regulate the use of tools such as ChatGPT in the academic sphere, guaranteeing that the creative process is genuine and that academic ethical principles are respected [32].

Authorship refers to the formal recognition of an individual's contribution to the creation of an academic or intellectual work. This concept is fundamental in academic production, as it ensures that those who create original content receive due credit for their work. In AI-assisted research, the question arises as to who the true author of the generated content is. If a researcher uses ChatGPT to write an article or part of a study, the question arises as to whether authorship should be attributed to the researcher, to the AI model or whether the researcher's contribution is limited to editing or supervising the text. In addition, there is a risk that texts generated by ChatGPT may overlap with pre-existing work, which could lead to cases of inadvertent plagiarism. This highlights the need for clear policies on the use of AI in academia and the attribution of intellectual authorship, thus protecting the integrity and originality of academic work [33].

The perceived impartiality of ChatGPT encourages greater intention to use it, as students value its objectivity and consider it essential to maintaining neutrality in their research. When users perceive that the tool presents information free of bias, their confidence in the resource increases, as does their willingness to continue using it in academic projects. Therefore, the perception of impartiality strengthens trust and commitment to educational technology, promoting its long-term adoption [34, 35].

Hypothesis 5: The perception of ChatGPT's impartiality has a significant positive relationship with the intention of future use.

Academic originality is a fundamental principle in the production of knowledge, which involves the creation of ideas, theories, analyses or findings that have not been previously presented by other authors [36, 37]. An original academic work is distinguished by its novel contribution to the field, whether in the form of new methodologies, approaches, hypotheses or discoveries. Originality is valued because academic and scientific progress depends on innovation and on the ability of researchers to advance the state of knowledge [38].

In practice, originality does not necessarily mean that all parts of a paper must be completely new, but there must be a distinctive approach or an innovative way of addressing existing problems [39, 40]. Academic works that simply replicate previous studies or do not add value to existing knowledge run the risk of being considered as lacking originality. Furthermore, to guarantee originality, it is essential that authors recognise the influence of previous works through appropriate citations and references [41-43, 45].

Academic integrity refers to the set of ethical principles that guide the conduct of students, teachers and researchers in the production and dissemination of knowledge. It involves acting with honesty, transparency and responsibility in all aspects of academic work, from data collection and analysis to the presentation of results [46, 47]. The perceived usefulness of ChatGPT encourages researchers to use it, as students value tools that optimise their academic processes and enable them to achieve more effective results in less time. Research into educational technology confirms that the perception of a tool's practical functionality reinforces the decision to integrate it permanently into academic activities, especially when it contributes to improving productivity and the quality of work [48].

Hypothesis 6: The perceived usefulness of ChatGPT has a significant positive relationship with the intention of future use.

Plagiarism is a serious violation of academic ethics that involves presenting the work, ideas or words of another person as one's own without giving due credit to the original author. It is a dishonest practice that goes against the principles of originality and intellectual property that underpin academia [49]. Plagiarism can be intentional or unintentional, but in both cases it compromises the legitimacy of academic work, affecting both the student or researcher who commits the offence and the academic system as a whole. To avoid plagiarism, it is essential to correctly cite all sources used and to ensure that any external material is properly attributed, which not only protects the rights of the original authors, but also reinforces the integrity of one's own academic work [50].

Academic quality refers to the excellence of a research paper and is measured by its ability to meet the highest methodological, theoretical and ethical standards [51]. A quality academic paper should be based on a critical and comprehensive review of the literature, employ a sound and appropriate methodology, and present results that contribute significantly to knowledge in the field of study Gallagher and Wagner [44]. According to recent studies, when users perceive that a tool produces high-quality, error-free content, they are more willing to continue using it over time [52]. The perceived reliability of ChatGPT, by reinforcing students' trust, promotes its constant use in future academic activities [53].

Hypothesis 7: The reliability of the content generated by ChatGPT has a significant positive relationship with the intention of future use.

4. Methodology

4.1. Research Approach and Design

This research adopts an applied approach with a non-experimental-cross-sectional design [54, 55]. It has a quantitative focus, centred on the analysis of algorithmic biases and ethical considerations in the use of ChatGPT for academic research [56]. This research used structural equation modelling (SEM) implemented with SmartPLS, allowing for the analysis of relationships between latent variables. Unlike previous descriptive studies, this explanatory approach delves deeper into the causal relationships between key variables.

4.2. Participants and Sample

The sample consisted of 5,000 participants from 20 universities, both public and private, representing a diversity of ages and academic levels. In terms of age distribution, 48% were between 21 and 25 years old, 42% were under 21, and 10% were between 26 and 30. In terms of academic level, 45% of the students were in their third year, 25% in their first year, 18% in their fourth year and 12% in their second year.

4.3. Data Collection Instruments

The questionnaire, consisting of 24 questions, was developed incorporating latent and observed variables derived from the existing scientific literature. These variables are detailed in Table 1.

Table 1.
Constructs: Latent and Observed Variables

Latent variables	**Observed variables**	
Content reliability	CR1	Accuracy and reliability
	CR2	Confidence in the information
	CR3	Academic consistency
Ease of use	EOU1	Ease of use
	EOU2	Time-saving
	EOU3	No advanced skills required
Perceived fairness	PF1	Impartiality
	PF2	Neutral approach
	PF3	No predefined bias
Ethical concerns	EC1	Academic integrity
	EC2	Ethical issues
	EC3	Authorship risks
Perceived usefulness	PU1	Research efficiency
	PU2	Rapid development
	PU3	Quality of results
Intention of future use	IFU1	Continued use
	IFU2	Key tool
	IFU3	Increased usage frequency
Acceptance of ChatGPT usage	AU1	Full acceptance
	AU2	Standard tool
	AU3	Value in research
Academic research	AR1	Prior verification
	AR2	Conscious usage
	AR3	Ethical consideration

4.4. Convergent Validity

Convergent validity was assessed through the average variance extracted (AVE), applying a threshold of 0.5 to guarantee adequate theoretical representation. For discriminant validity, the Fornell-Larcker criteria and the heterotrait-monotrait ratio (HTMT) were used, which confirmed that each construct is distinct and well differentiated from the others. Finally, the path coefficients and their p-values were calculated within the structural model to test the hypotheses related to the use of ChatGPT and the variables linked to ethics and academic quality.

4.5. Model Convergence

Convergence in variance-based structural equation models, such as the PLS-SEM method, was crucial to ensure that the results obtained are reliable and accurately represent the relationships between the variables. In this context, the SmartPLS iterative algorithm reached convergence in less than the maximum configured limit of 300 iterations, indicating a stable solution and a well-adjusted model. The evaluation of convergence was based on the stopping criterion of the PLS algorithm, which verifies that the differences between the estimation values in consecutive iterations are sufficiently small. This ensures that the relationships between constructs, measured in terms of factor loadings and path coefficients, stabilise at consistent values without the need for additional adjustments.

In this study, the algorithm reached convergence in the 12th iteration, as shown in the SmartPLS results. This result confirms that the estimated parameters are stable and that the structural model is well specified for the data analysed. The rapid convergence of the model indicates a solid structure, allowing us to proceed with the interpretation of the path coefficients and other model fit indices.

Table 2.
Construct validity and reliability.

Construct	Cronbach's alpha	Rho_A	Composite reliability	Average variance extracted (AVE)
Academic research	0.882***	0.896**	0.928***	0.811***
Acceptability of using ChatGPT	0.874**	0.896**	0.923**	0.801**
Ease of use	0.840**	0.892**	0.903**	0.758**
Ethical concerns	0.840**	0.976***	0.900**	0.755**
Intention for future use	0.870**	0.892**	0.922**	0.798**
Perceived fairness	0.898***	0.963***	0.936***	0.831***
Perceived usefulness	0.807**	0.816*	0.888**	0.726**
Reliability of content	0.818**	0.839**	0.894**	0.739**

Note: *** $p < 0.001$, ** $p < 0.01$, *$p < 0.05$.

5. Results

5.1. Analysis of Construct Validity and Reliability

The construct validity and reliability Table 2 shows that all the constructs have high levels of internal consistency, as evidenced by Cronbach's alpha and composite reliability values greater than 0.8, which indicates excellent reliability of the scales used. Furthermore, the AVE values, all greater than 0.7, reflect adequate convergent validity, ensuring that the items within each construct accurately represent the theoretical concept. Together, these results confirm that the constructs are valid and reliable, providing a solid basis for further analysis in the structural model.

Table 3.
Discriminant validity.

Construct	Academic research	Acceptability of using ChatGPT	Ease of use	Ethical concerns	Intention for future use	Perceived fairness	Perceived usefulness	Reliability of content
Academic research	0.900***							
Acceptability of using ChatGPT	0.936***	0.895***						
Ease of use	0.935**	0.988***	0.871***					
Ethical concerns	0.204	0.281	0.328	0.869***				
Intention for future use	0.800*	0.865**	0.921**	0.389	0.893***			
Perceived fairness	0.58	0.65	0.701	0.419	0.77	0.912***		
Perceived usefulness	0.159	0.224	0.252	0.485	0.286	0.241	0.852***	
Reliability of content	0.748	0.814	0.867	0.472	0.939	0.741	0.311	0.860***

Note: *** $p < 0.001$, ** $p < 0.01$, *$p < 0.05$.

5.2. Discriminant Validity Analysis

The discriminant validity of the model, evaluated according to the Fornell-Larcker criterion, is confirmed by observing that the square root of the AVE for each construct is greater than its correlations with the other constructs. For "Academic Research," the value is 0.900, which exceeds its correlations with other constructs. Similarly, "Acceptability of Using ChatGPT" has a diagonal value of 0.895, while its correlations with other constructs do not exceed this value. Likewise, "Ease of Use" and "Ethical Concerns" exhibit square root AVE values of 0.871 and 0.869, respectively, each greater than their correlations with other elements in the model. Other constructs, such as "Intention for Future Use" (0.893), "Perceived Fairness" (0.912), "Perceived Usefulness" (0.852), and "Reliability of Content" (0.860), also exceed their respective correlations with other constructs, indicating a clear and consistent separation among them. These results reinforce discriminant validity, ensuring that each construct measures its specific concept without overlap with other elements in the model.

Table 4.
Structural model R^2 and f^2 values.

Construct	R^2	Adjusted R^2	f^2 (Effect Size)
Academic research	0.875	0.873	Acceptability of using ChatGPT: 7.022 (Great effect)
Acceptability of using ChatGPT	0.748	0.744	Intention for future use: 2.962 (Great effect)
Intention for future use	0.935	0.930	Ease of use: 0.531 (Moderate)
			Reliability of content: 0.815 (Moderate-Great)
			Ethical concerns: 0.021 (Small)
			Perceived fairness: 0.094 (Small)
			Perceived usefulness: 0.003 (Small)

5.3. Evaluation of the Structural Model

The R^2 and f^2 values Table 4 presents the explanatory power and effect size of each variable within the evaluated structural model. The R^2 and f^2 values reveal that the model has a high level of fit, with the variable "Intention for Future Use" standing out particularly with an R^2 and f^2 of 0.935, suggesting that the model explains 93.5% of its variability. Regarding f^2, the results indicate that "Acceptability of Using ChatGPT" has a considerable impact on "Academic Research," with an f^2 of 7.022, indicating a substantial and significant effect. In contrast, other f^2 values, such as that for "Perceived Usefulness" on "Intention for Future Use" (0.003), reflect a minimal effect, suggesting limited relevance in that relationship. Collectively, these indicators enhance understanding of the model structure, highlighting both the magnitude and significance of individual relationships and the explanatory strength of the model in terms of ChatGPT usage in academic research.

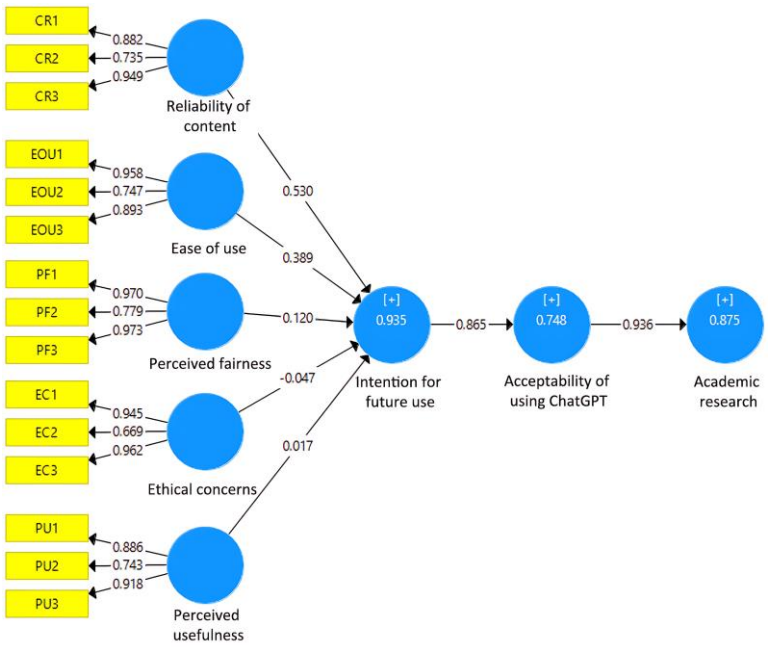

Figure 1.
Relationship between variables in a reflexive model.

5.4. Theoretical Model

The model includes "Acceptance of ChatGPT Usage" and "Academic Research," with exogenous constructs such as Ease of Use, Content Reliability, Perceived Fairness, Ethical Concerns, and Perceived Usefulness. The Intention of Future Use shows an R^2 of 0.935, indicating that 93.5% of its variance is explained by constructs like Ease of Use (0.389) and Content Reliability (0.530). Acceptance of ChatGPT Usage has an R^2 of 0.748, significantly influenced by Intention of Future Use (0.865), while Academic Research reaches an R^2 of 0.875, strongly impacted by Acceptance of ChatGPT Usage (0.936). Non-significant relationships, such as those of Perceived Fairness and Ethical Concerns with intention to use, suggest these factors have little or no influence on the predisposition to use ChatGPT in the future. In summary, reliability and ease of use are crucial determinants for ChatGPT usage, with acceptance serving as an essential mediator for its application in academic research.

Table 5.
Path coefficients.

Relationship	Original coefficient	Sample mean	Standard deviation	t-value	p-value
Acceptance of ChatGPT -> Academic research	0.936	0.941	0.032	28.933	0.000
Ease of Use -> Intention of future use	0.389	0.421	0.184	2.117	0.034
Ethical considerations -> Intention of future use	-0.047	-0.044	0.038	1.248	0.212
Intention of future use -> Acceptance of ChatGPT	0.865	0.872	0.067	12.854	0.000
Perceived fairness -> Intention of future use	0.120	0.118	0.078	1.539	0.124
Perceived usefulness -> Intention of future use	0.017	0.015	0.036	0.476	0.634
Content reliability -> Intention of future use	0.530	0.494	0.180	2.945	0.003

5.5. Structural Model Path Coefficients

The Path Coefficient Table 5 highlights the strength and significance of relationships within the structural model. Acceptance of ChatGPT has a strong, significant influence on Academic Research (coefficient = 0.936; t-value = 28.933; $p < 0.001$). Similarly, Ease of Use drives Intention of Future Use (coefficient = 0.389; t-value = 2.117; $p = 0.034$). However, Ethical Considerations and Perceived Fairness do not exhibit significant relationships with the intention to use, while Content Reliability shows an important positive effect (coefficient = 0.530; t-value = 2.945; $p = 0.003$). These findings indicate that acceptance and reliability are key factors for the adoption and future use of ChatGPT in an academic context.

6. Discussion

The results of the study confirm that the acceptance of the use of ChatGPT has a positive and significant relationship with academic research, with a trajectory coefficient of 0.936 ($t = 28.933$, $p < 0.001$). This finding validates the proposed hypothesis and aligns with the conclusions of Lestari, et al. [40] who emphasise the influence of technology on decision-making and leadership within educational environments. In this context, the acceptance of ChatGPT as a support tool facilitates the production of academic research, although it also raises ethical challenges related to authorship and originality. Nguyen and Goto [34] argue that trust is a key factor in the use of academic technologies, which also supports ChatGPT's positive impact in this area.

Ease of use, with a significant coefficient of 0.389 ($t = 2.117$, $p = 0.034$), reinforces the idea that accessible and practical design encourages the intention of future use. Duah and McGivern [50] and Renkema and Tursunbayeva [56] emphasise that intuitive educational technologies not only optimise learning processes, but also guarantee their sustained adoption in academic activities. Ease of use is also related to perceived usefulness, a concept supported by Sevnarayan and Potter [45] who found that the integration of technological tools improves efficiency in the generation of academic content.

However, variables related to ethical concerns and perceived fairness did not show a significant relationship with the intention of future use. This lack of impact may be related to the priorities of students, who tend to value the functionality and accessibility of the tool over its immediate ethical implications. Li and Coates [33] point out that the practical benefits of technologies often outweigh ethical considerations in educational contexts, while Cain, et al. [21] emphasise the need for clear guidelines to ensure the ethical use of tools such as ChatGPT.

The acceptance and use of ChatGPT reflects a shift in the dynamics of academic production, with artificial intelligence tools transforming the way students access, process and present information. [28] examine how technologies influence academic decision-making, a phenomenon also observed in the adoption of ChatGPT, where students prioritise efficiency over other factors. These findings spark a debate about the balance between the use of technological tools and the development of critical and ethical skills in higher education.

The debate is enriched by the analysis of the relationship between ease of use and intention of future use, a key aspect of the TAM model, according to Kong, et al. [30]. A positive perception of a technological tool can guarantee its long-term integration into academic practices, as long as its accessibility and functionality are maintained. However, authors such as Segbenya, et al. [38] warn that algorithmic biases can compromise equity in academic outcomes, an aspect relevant for future studies.

The results indicate that the acceptance and ease of use of ChatGPT are key factors for its adoption in academic research. These results are consistent with previous studies, such as those by Al-Mamary, et al. [39] and Lestari, et al. [40] which highlight the importance of guiding the ethical use of technologies in higher education. However, it is necessary to

delve deeper into the ethical implications and risks of technological dependence to ensure a responsible and balanced use of these tools in the academic sphere.

7. Conclusions

This study confirms that the acceptance and perceived reliability of ChatGPT content are crucial factors in students' intention to use this tool in future academic research. The significant and positive relationship between the acceptance of ChatGPT use and its applicability in academic research (coefficient = 0.936) shows that, as students value this technology, they integrate it as an essential resource in their research activities. This integration is due not only to the ease of use, but also to the perceived reliability of the content generated by ChatGPT, which reinforces students' decision to use it in future research projects ($f^2 = 0.815$).

The results also establish that ethical considerations and the perception of fairness do not significantly influence the intended use of ChatGPT. This suggests that students do not perceive substantial risks in these areas, indicating a lack of critical awareness regarding the potential biases and ethical dilemmas associated with this tool. The relationship between ease of use and intention of future use (coefficient = 0.389) emphasises that, while technological accessibility contributes to the adoption of ChatGPT, its impact is less significant than the perceived reliability and general acceptance of the tool.

These findings have important practical implications for academic institutions, which should implement regulations and guidelines for the use of ChatGPT in academic contexts. It is essential that these guidelines promote a critical understanding of the inherent biases and ethical issues associated with the use of AI in research, ensuring that students can benefit from this tool without compromising academic integrity. Taken together, this study provides strong evidence on the factors driving the adoption of ChatGPT in higher education and lays a solid foundation for future research on the impact of artificial intelligence in education.

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