Arab World English Journal
INTERNATIONAL PEER REVIEWED JOURNAL ISSN: 2229-9327

Arab World English Journal (AWEJ) Special Issue on CALL Number 11. July 2025 Pp. 192-209
DOI: https://dx.doi.org/10.24093/awej/call11.12

AI Usage in Academic Writing Among Moroccan Doctoral Researchers at Sidi Mohamed Ben Abdellah University

Fatima Zahra Aich
Sidi Mohamed Ben Abdellah University, Fez, Morocco
Corresponding Author: fatimazahra.aich@usmba.ac.ma

Lahoucine Boumahdy
Sidi Mohamed Ben Abdellah University, Fez, Morocco
Email: lahoucine.boumahdy@usmba.ac.ma

Ismail Benfilali
Sidi Mohamed Ben Abdellah University, Fez, Morocco
Email: ismail.benfilali@usmba.ac.ma

Kebir Sandy
Sidi Mohamed Ben Abdellah University, Fez, Morocco
Email: Sandykebir@hotmail.com

Received: 04/15/2025 Accepted: 07/07/2025 Published: 07/26/2025

Abstract
Artificial Intelligence (AI) is improving research methods in higher education worldwide, encouraging scholarly creativity and accelerating research. This article explores the use of artificial intelligence among Moroccan doctoral students in the context of PhD dissertations and article writing. It offers a new perspective not only on attitudes towards artificial intelligence but also on practices within Moroccan doctoral education. A mixed-methods approach is used to evaluate postgraduate behaviour and ethical practices related to Artificial Intelligence. Based on responses from 80 participants in a questionnaire administered to first-, second, and third-year doctoral students at Sidi Mohamed Ben Abdellah University, Fez, the study collected both quantitative and qualitative data through a combination of closed-ended and open-ended questions. For quantitative analysis, SPSS version 27 was employed, including both descriptive and inferential statistics to answer the research questions. The qualitative data were analysed thematically. Ethical considerations were prioritised, including informed consent and confidentiality measures for respondents. Results show that 76.3% of PhD students utilise artificial intelligence for thesis-related activities, such as brainstorming ideas and designing outlines, with some holding neutral views and most showing moderate agreement regarding its use. The study concludes that there is an urgent need for artificial intelligence literacy training in Moroccan universities to promote responsible use, as well as for universities to establish clear guidelines for their ethics committees.

Keywords: artificial intelligence, academic honesty, academic writing, attitudes, doctoral students, practices

Cite as: Aich, F. Z., Boumahdy, L., Benfilali, I., & Sandy, K. (2025).AI Usage in Academic Writing Among Moroccan Doctoral Researchers at Sidi Mohamed Ben Abdellah University. *Arab World English Journal (AWEJ) Special Issue on CALL (11)*:192-209. https://dx.doi.org/10.24093/awej/call11.12

Introduction

The ongoing developments in artificial intelligence technology are rapid and unpredictably evolving. Several AI tools have been launched, and new ones are being developed. The integration of Artificial intelligence in higher education is revolutionising academia, particularly academic writing. Although AI-assisted writing tools are designed to help students and researchers throughout the writing process, saving time and effort, they also evoke concerns about academic honesty and credibility. Exploring Moroccan students' perspectives and practices of AI is essential for assessing its responsible deployment in Moroccan higher education.

However, it is worth noting that the integration of AI in higher education is still facing many disparities. As El Ghazali & Benbrahim (2024) highlighted, Moroccan higher education navigates the complexities of infrastructure imbalances between rural and urban areas, institutional support inequalities, and socio-economic barriers. Lack of access to decent, let alone high-speed, internet coverage in remote areas hinders improvement in use. Additionally, urban universities often offer more IT support and training. Lastly, lower-income students from rural areas often face affordability issues. However, studies applying the Unified Theory of Acceptance and Use of Technology (UTAUT) in the Moroccan context see more concerns related to access, equity, and informed use. While AI adoption should address data privacy and algorithm bias, it should also consider user readiness, digital confidence, and infrastructural realities that shape equal access opportunities (El Hazzat et al., 2024).

The need for sustainable solutions to emerging AI-related issues in academic research is becoming increasingly apparent. It has become an active research area for researchers and practitioners, due to its prospects for personalising the research and writing process and enhancing its quality. Researchers are conducting ongoing research on this topic worldwide. However, it remains novel within the Moroccan context. Several unresolved issues and gaps hinder a comprehensive understanding of AI ethical usage in academic writing among Moroccan doctoral students. Fulfilling these gaps is necessary to maintain research ethics and cultivate AI literacy in postgraduate students.

This study examines the use of AI-assisted writing tools by Moroccan doctoral students in their thesis writing process. It explores the potential of AI research writing while addressing its limitations and challenges. The research aims to contribute to the existing literature by providing new data concerning the implementation of artificial intelligence in Moroccan higher education, including practical applications of AI tools and solutions to AI ethical issues. It aims to explore these complexities using a mixed-methods approach, focusing on the perceptions, experiences, and emerging trends of doctoral students. It endeavours to shed light on how AI-academic writing dynamics are changing. The outcomes will help clarify how AI can be effectively integrated into academic writing techniques while considering potential flaws and ethical issues.

To address these objectives and aims, the study addresses three questions and hypotheses:

Research questions

RQ1: To what extent do SMBAU doctoral students use AI for their thesis writing?
RQ2: What are SMBAU doctoral researchers' attitudes towards generative AI?
RQ3: What are the main practices of AI in thesis writing? Do they align with academic integrity?

Research hypothesises

H1: SMBAU doctoral researchers use AI in academic writing.
H2: SMBAU doctoral researchers have a positive attitude toward AI tools.
H3: SMBAU doctoral researchers' conduct aligns with academic honesty and ethical guidelines.

The current research and theoretical literature are critically analysed to establish the context for this study. This study examines the convergence of academic writing and artificial intelligence, with a focus on the practical and ethical considerations of AI use in higher education. The literature review offers a comprehensive overview of current research, highlighting key gaps and suggesting directions for future investigations.

Literature Review

The use of generative artificial intelligence in academic writing and its potential to revolutionise academic research has sparked debates and controversies worldwide. AI, being at the forefront of innovation and continually advancing, presents challenges for research on its integration in academia. Longitudinal studies are needed to provide specific and clear illustrations of how different AI tools are used by students (Moussa & Belhiah, 2024; Boubker et al., 2024; Alberth, 2023) in academic research.

Ongoing research has been conducted on the application of ChatGPT, an AI tool developed by OpenAI, in various spheres (Boubker et al., 2024; Rudolph et al., 2023), including education in general and academia specifically. ChatGPT, a chatbot that facilitates text-based conversations in multiple languages, can help researchers become more effective writers and thinkers. Through prompts or queries and based on "its pre-trained massive data corpus", this chatbot can help researchers brainstorm research ideas, write a tentative outline, and generate hypotheses.

ChatGPT can also peer review and give feedback on researchers' manuscripts. In the Moroccan context, undergraduate and postgraduate students use ChatGPT and other AI applications to generate ideas and enhance their writing quality (Bouzar et al., 2024; Moussa & Belhiah, 2024). Such AI capabilities make it easy for ChatGPT to be considered an author and to produce a complete literature review instantly and effortlessly (Pavlik, 2023), which raises academic ethical concerns—plagiarism and academic honesty (Buriak et al., 2023; Chen, 2023; Liebrenz et al., 2023; Salvagno et al., 2023; Halaweh, 2023). A potential solution is collaboration between researchers and ChatGPT, considering the latter a co-author (Halaweh, 2023). Moussa and Belhiah (2024) and Al-Zubaidi et al. (2024) emphasised the need for explicit guidelines and strong ethical frameworks regulating AI use in Moroccan higher education. Another AI tool regarded as more reliable and precise for academic writing, albeit less widely recognised than ChatGPT, is known as Paperpal. This specialised large language model is explicitly created to assist researchers and students with their academic writing, editing, and formatting tasks (Pinzolits, 2023). However, the validity of these AI tools in the academic research context remains complex and debatable (Alberth, 2023). It is also argued that the use of AI, particularly ChatGPT, reduces creativity and independence (Van Dis et al., 2023). Although some may claim that ChatGPT and other AI tools are mainly overlooked because researchers have long relied on applications like SPSS (Statistical Package for Social Sciences) and Microsoft Excel to analyse their data, there is a clear distinction between the process of writing a research paper, which requires academic skills, critical thinking, creativity, and contributions to academia, and the mechanical process of analysing quantitative data.

Nevertheless, the field of AI is diverse, and there are other AI tools that postgraduate researchers can depend on when writing their literature review, such as Consensus, Elicit, Inciteful,

Laser AI, Litmaps, and Research Rabbit (Pinzolits, 2023). All of this underscores the importance of conducting a thorough study to examine the AI tools used by Moroccan doctoral students in their research papers, as well as their attitudes towards these tools, in order to promote a valid and informed integration of AI in Moroccan academia.

Attitudes (a manifestation of perceptions) and practices towards Artificial Intelligence (AI) are worth investigating in a period marked by a public boom of AI in industry and academia. A simple online search in the former field of inquiry shows a wealth of publications available (537,070 on Scopus; 471,859 on Web of Science). After including the keywords "attitudes" and "practices," a decrease in the numbers was observed (645 on Scopus; 10 on Web of Science), indicating the need for further studies in this area. However, the public's view of AI-based technologies is rarely rooted in writings, but is mainly shaped by the media. Stai et al. (2020) stated that "(…) media coverage has the possibility of increasing the public's confidence and inflating the capabilities of such technology."

Attitudes towards AI tend to be controversial, ranging between the binary positions of trust and scepticism. Luca Liehner et al. (2023) found out that "respondents considered chances in the use of AI to support people in their everyday life by, for instance, automating processes and thus reducing work time (> 90% agreement)." This implies that the public is reasonably likely to anticipate the usefulness of AI. Similarly, Bouzar et al. (2024) and Moussa and Belhiah (2024) noted that Moroccan university students are adopting a cautious yet increasingly positive attitude toward ChatGPT and other AI tools. The present research aims to thoroughly investigate whether this tendency towards usefulness can be generalised and is also observable among Moroccan doctoral students at Sidi Mohamed Ben Abdellah University. Employing a Technology Acceptance Model, Zou and Huang examined the attitudes of Chinese postgraduate students, which were influenced by their perceptions of using ChatGPT for writing. They found that attitude is a key predictor of the intention to use ChatGPT for writing and acts as a mediator for how perceived usefulness and ease of use influence this intention (2023). This centralises the study of attitudes as a prerequisite for stimulating practical and behavioural intentions. Experience, price value, and habit proved to be influential factors in establishing a helpful attitude towards AI, meaning that behavioural intentions, whether intrinsic or extrinsic, can change one's perspective (Romero-Rodríguez et al., 2023).

On the other hand, attitudes showcase concern towards AI. Despite the pressing need for and use of AI in everyday life, a margin for scepticism still exists. Raison d'être of these suspicions arises from an ethical perspective, foregrounding "whether the use of AI is appropriate and legal in a scholarly context' (Tomlinson et al., 2023). A thorny question is whether the previous ethical and legal view extends to the use of AI in language evaluation. Students expressed that they positively perceive the use of AI in 'Automated Writing Evaluation (AWE)' (Abdul Rahman et al., 2023). Balel (2023) called for exploring new ways of using Language Learning Models without portraying prejudices.

While attitudes are pivotal in influencing behavioural intentions, practices remain central to shaping a quality research sphere for doctoral students. Good practices in scholarly writing include but are not limited to 'fact-checking, ' 'text-verification and proofreading, ' 'limitation and potential bias consideration, ' plagiarism,' 'copyright and fair use' (Tomlinson et al., 2023). Implementing these practices will enhance the quality of AI-assisted writing.

Therefore, this article focuses on investigating the use of quality control measures by Moroccan doctoral researchers during the writing process. Furthermore, it scrutinises whether their attitude

towards AI, as a rapidly growing field of technological advancement, and their practices align with the expressed attitudes.

Method

Data collection, sampling

The study employed a mixed-methods approach and was conducted during the 2024/2025 academic year, specifically within three months (September to November). It used a questionnaire as its primary data collection method. It contains six scales, each of a varying number of items. First, the consent form demonstrated the respondents' willingness to participate in the research voluntarily. Second, demographic information was collected to identify the sample population. Third, data on the usage of AI in academic writing was gathered through three items to determine whether the respondents use AI in the process of writing their theses, the tools they employ, and the perceived benefits of relying on AI in academic writing. Fourth, detailed data were collected in six items to explore how AI is applied in academic writing. Fifth, the attitudes of the sample population towards AI applications in academic writing were examined using three items. Finally, five items addressed the ethical considerations regarding the usage of AI in academic writing. The questionnaire included open-ended questions, which are used to enrich a thematic analysis of AI benefits and the various tools employed, without limiting respondents' answers to a limited number of options. This approach aimed to acquire an in-depth understanding of their views. The thematic analysis was conducted based on three emergent themes: (a) efficiency and time-saving, (b) idea generation and structuring, and (c) quality enhancement. This questionnaire has undergone several modifications. A Cronbach's Alpha test was run using the 27th version of SPSS Software. The scales produced satisfactory results (α = 0.85, 0.77, 0.76), indicating that the data collection instrument is reliable.

Table 1. *Test of reliability*

Scale	Items	Cronbach's Alpha
Attitudes	3	0.85
Practices	7	0.76
Ethical usage	2	0.77

Participants

The study involved 80 doctoral researchers in their first, second, and third years at SMBAU within the English Department. The total number of enrolled doctoral researchers within different disciplines is 5409. The participants consisted of 46% males and 54% females, with the majority being first-year doctoral students (n = 54). The demographic age range was 22 to 27 years. They were all chosen through a non-stratified sampling, taking into account their current enrollment, availability to answer the questionnaire, and whether they were currently writing their thesis and/or article. The sample size faced limitations in not being able to have any representation from the 6th-year doctoral students.

Table 2. *Participants' age and academic year*

Age	Count	95.0% Lower CL for Column N% %
22-27	31	28.6%
27-34	16	12.4%
34-45	27	24.1%
45-55	6	3.2%
Academic year		
1st	54	56.8%
2nd	14	10.4%
3rd	5	2.4%
4th	4	1.7%
5th	3	1.1%
6th	0	.

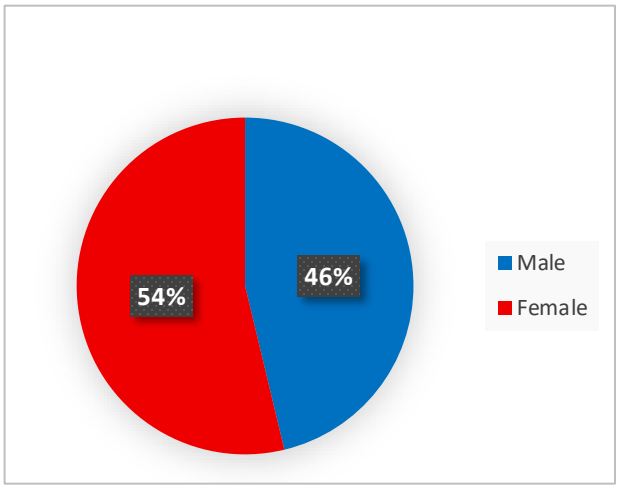


Figure 1. Participants' gender

Research Instruments

Questionaire

The questionnaire was designed to investigate doctoral students' attitudes and practices regarding AI at Sidi Mohammed Ben Abdallah University (SMBAU) within the English Department. The questionnaire was distributed electronically via academic email and doctoral researchers' WhatsApp and Facebook groups to a total of 5409 enrolled doctoral students, resulting in a final sample of 80 doctoral students. The data collection procedure, based on electronic consent, was divided into five parts: the first focused on demographic information relevant to enrolment and the academic year. The second focused on verifying the doctoral researcher's use of generative AI technologies. The third included three items to measure attitude towards AI using a Likert scale. The fourth involved six items to understand the practical usage of AI in academic writing. Finally, the fifth aimed to gauge ethical considerations and assess the honesty of doctoral researchers through five items. The questionnaire also included open-ended questions, which are used to enrich thematic analysis and gain an in-depth understanding of some responses.

Data analysis

The Statistical Package for the Social Sciences (SPSS), developed by IBM Corporation and specifically version 27, was utilised to facilitate a detailed analysis of the collected data. The initial stage of the study involved presenting descriptive statistics to provide a detailed overview of the dataset, including means and standard deviations, which help identify the central tendency and variability of the dataset. Inferential statistics were then employed to investigate the relationships and patterns within the data.

Ethical considerations

Ethical issues were of paramount importance in undertaking this research, reaffirming dedication to the ethical conduct of academic research. Online informed consent was a crucial aspect of the study, ensuring that respondents fully understood the research purpose and voluntarily chose to participate, sharing their views and experiences. Strict measures were implemented to protect respondent confidentiality, thereby upholding the ethical standards of academic research. Potential limitations, especially the difficulty of obtaining a representative sample, are recognised and addressed, emphasising the ongoing necessity for future research to enhance inclusivity in studying doctoral students' use of AI in their academic writing. These ethical considerations collectively strengthen the validity and integrity of the current research, highlighting the researchers' commitment and compliance with ethical research standards.

Results

Quantitative Results

The first issue explored in the questionnaire was whether or not respondents use AI in their doctoral research. The findings, as shown below in Table One, revealed that the majority of participants (76.3%) utilise AI in writing their doctoral-related academic tasks.

Table 3. *AI Usage in Doctoral Academic Writing*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	61	76.3	76.3	76.3
	No	19	23.8	23.8	100.0
	Total	80	100.0	100.0	

The second focus of this research was to investigate the attitudes of PhD students toward the use of AI in academic research. Most respondents showed a neutral attitude (M = 2,65, SD = 1.13) toward AI use in thesis writing, as quantified on a 5-point Likert scale. Similarly, they also exhibited neutral comfort (M = 2.96, SD = 1.17) by incorporating its suggestions into their theses. Nevertheless, the vast majority of respondents reported moderate agreement (M = 2.62, SD = 1.21) on the item that AI tools improve their academic writing.

Table 4. *Doctoral students' attitudes towards AI in thesis writing*

Descriptive Statistics

	N	Mean	Std. Deviation
AI tools enhance the quality of academic writing.	80	2.6500	1.13740
How comfortable are you with incorporating AI suggestions in your writing process?	80	2.9625	1.17402
Rate the extent to which you believe AI tools improve the quality of your written work.	80	2.6250	1.21567
Valid N (listwise)	80		

The second main issue that this study explores is practices. Respondents, in response to the first question about using AI to brainstorm ideas, are optimistic, with a 65% answer rate.

Furthermore, a follow-up question about using AI for tentative outline writing received positive responses at a rate of 53.8%. Regarding the question of using AI for writing hypotheses, respondents who have not used AI for this purpose constitute the most significant percentage at 63.7%. In the same vein, a negative 68.8% is the respondents' answer to the use of AI to design and guide research experiments. Regarding AI assistance in bibliography writing, only 35% of respondents responded positively, while 65% responded negatively. Finally, the last question in the practices section was *Have you ever used AI to review and provide feedback on your written manuscript?* The answers reported 57.5%, signifying that more than half of the respondents have not used AI for that purpose.

Table 5. *Doctoral students' practices of AI in thesis writing*

			Frequency	Percent
AI practices	Yes	Have you ever used AI to brainstorm research ideas?	52	65.0%
		Have you ever used AI to write a tentative outline?	43	53.8%
		Have you ever used AI to generate hypotheses?	29	36.3%
		Have you ever used AI to design and guide research experiments?	25	31.3%
		Have you ever used AI to assist in creating your research bibliography?	28	35.0%
		Have you ever used AI to review and provide feedback on your written manuscript?	34	42.5%
	No	Have you ever used AI to brainstorm research ideas?	28	35.0%
		Have you ever used AI to write a tentative outline?	37	46.3%
		Have you ever used AI to generate hypotheses?	51	63.7%
		Have you ever used AI to design and guide research experiments?	55	68.8%
		Have you ever used AI to assist in creating your research bibliography?	52	65.0%
		Have you ever used AI to review and provide feedback on your written manuscript?	46	57.5%

For ethical considerations, awareness of AI capabilities and limitations is essential in dealing with such a rapidly advancing technology tool. Respondents' answers to awareness of AI capabilities and limitations scored remarkably similarly. The highest response percentage was for those who were moderately aware of both aspects, and the second-highest was for those who were very aware of both aspects. Lastly, respondents can be divided into two main groups: the dominant group, with 31.3% who are confident in their use of AI in academic work, and a smaller group,

with 21.3%, who are also confident in aligning with ethical standards and avoiding plagiarism or dishonesty.

Table 6. *Doctoral students' level of awareness of AI capabilities and limitations*

Item Statistics

	Mean	Std. Deviation	N
How would you rate your awareness of AI capabilities?	3.0125	1.10801	80
How would you rate your awareness of AI limitations?	2.9375	1.09479	80

Correlations

Since some items on the questionnaire were in a dichotomous format (yes/no) and others used a Likert scale, Spearman's rho was an appropriate test to use because this method allows for the analysis of ordinal data and variables that may not have a direct linear relationship. This test identified two positive correlations: the correlation between the use of AI and practices was found to be a moderate positive relationship, $r = 0.53$, $p < 0.01$. This suggests that as AI use increases, so does the practice of AI. Another positive but weak correlation is observed between doctoral students' attitudes towards AI and their practice of applying AI tools in thesis writing, $r = 0.03$, $p < 0.05$. This suggests that more positive attitudes towards AI are somewhat related to higher adoption of AI practices.

Table 7. *Correlation between doctoral students' practices and attitudes towards AI*

Spearman's rho	Practices	Correlation Coefficient	1	.239*
		Sig. (2-tailed)	.	0.033
		N	80	80
	Attitudes	Correlation Coefficient	.239*	1
		Sig. (2-tailed)	0.033	.
		N	80	80
*. Correlation is significant at the 0.05 level (2-tailed).				

Qualitative Results

A thematic analysis of the responses provided by the doctoral researchers reveals several key themes regarding the primary benefits of using AI in academic writing.

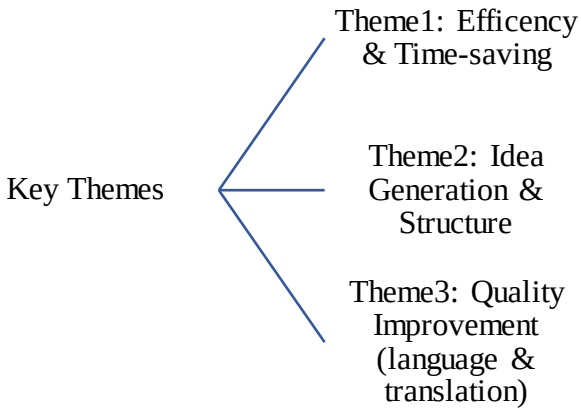


Figure 2. Key Themes

Theme 1: Efficiency and Time-Saving

Doctoral researchers in their academic journey strive for the utmost optimisation of efficient and time-saving tools. AI provides services that generate new ideas, help obtain information more quickly, and enhance productivity. This is evident in participant 8's statement, *"It saves time. Sometimes when you look for specific info, you can spend the whole day searching for this info, but with chat AI, everything is easy."* Similarly, participant 15 expressed that AI helps with *"creativity, efficiency, speed."* Further, doctoral researchers also seem to enjoy the learning process, participant 85 states, *"it saves time and effort. It gives the user a personalised learning experience (they interact with the AI assistant as if talking with a human being). They are problem solvers."*

Theme 2: Idea Generation and Structuring

AI is helping doctoral researchers overcome the blank page issue by generating ideas, offering suggestions, and strengthening structures. In regards to generating ideas, participant 30 says it helps in "generating ideas", and the same for participant 84, expressing how AI is an aid, "… brainstorming ideas." On the structural level, participant 67 expressed that AI is helping with "reformulating sentences." These statements display the extent to which AI is offering support to researchers with their academic tasks.

Theme 3: Quality improvement (language and translation)

Participants emphasised how AI tools contributed to enhancing the efficiency and precision of the academic work. Participant 70 stressed how AI can act as a writing assistant and improve the output: "*Writing assistance: AI tools can help with grammar, spelling, and style, ensuring that the academic writing is clear and professional."* Another participant, 83, emphasised a similar point of view in that AI helps to *"save time, boost writing quality."* Since Moroccan doctoral researchers are not native English speakers, grammar and natural readability play a crucial role in enhancing the quality of research papers, as participant 58 shared, noting that AI is *"improving readability and correcting grammatical errors."* Other aspects that could boost research quality are rewriting and paraphrasing, as stated by participant 61 in "rewriting and synthesising". and participant 80 in *"paraphrasing, development of ideas."*

In the same vein, participant 69 shared, *"It helps with checking grammar, structure, the spelling mistakes…"* Nowadays, AI is transforming writing quality by enhancing clarity and structure, from correcting spelling mistakes to accurately constructing complex sentences. However, with multilingual sources, the task requires translational skills. Moroccan doctoral researchers expressed their use of AI tools for translating content for their academic research: participant 79 states that one of the benefits of using AI is for "translation", another participant, 57, mentioned "… understanding something about my topic, and sometimes I use it for translation."

Discussion

The results discussed the Moroccan postgraduate students' perspectives and uses of AI technologies in incorporating them into thesis writing, with findings on research ethics. The discussion considers the findings in light of the research questions and hypotheses formulated, paying attention to the qualitative responses gathered in the open-ended questions of the questionnaire, and their implications based on related literature. The discussion highlights the essential role of AI literacy in upholding academic honesty.

RQ1: To what extent do SMBAU doctoral students use AI for their thesis writing?

The results showed that a high percentage of doctoral researchers incorporate generative AI into the writing workflows of their theses as well as articles. On the one hand, out of 80 participants surveyed, 76.3% reported using AI tools in their research process. The answers to the practices section would reveal the specific tasks carried out using these technologies. On the other hand, only 23.8% reported that they do not use AI for their thesis-related tasks. The latter might raise concerns of a lack of familiarity with the new trend, issues of reliability, and ethical implications. To address the lack of familiarity, it is time for educators to start introducing these technologies into their classrooms and encouraging a responsible and constructive use in education. (Baidoo-Anu & Owusu Ansah, 2023)Finally, despite the low percentage of non-users, which may be due to various factors, it is evident that AI is gaining ground in both daily life and academia. (Alqahtani & Wafula, 2025; Bai et al., 2025; Wagner et al., 2022; Zawacki-Richter et al., 2019).

RQ2: What are SMBAU doctoral researchers' attitudes towards generative AI?

Despite the presence of studies that have shown an increasingly positive attitude towards AI, some caution is still reported (Bouzar et al., 2024; Moussa & Belhiah, 2024). The results revealed that PhD researchers' attitude towards AI is marked by a neutral stand (M = 2.65, SD = 1.13). Additionally, researchers demonstrated moderate agreement in believing that AI can enhance the quality of their written work. This can be interpreted in light of two views: first, it provides evidence for the above caution reported by previous studies; second, it may be due to institutional influence, whereby the practical inclusion of AI is not yet a reality but is still deferred. Nevertheless, the results on incorporating AI suggestions into their theses revealed a relatively neutral comfort (M = 2.96, SD = 1.17).

The above findings on attitudes contrast with Boubker's (2024) on perceived usefulness concerning high satisfaction. Boubker (2024) suggested that there is a strong alignment between user expectations and the tool's performance. For instance, undergraduates may find it easier to

perceive the usefulness of AI within simplified workflows. In contrast, doctoral researchers' tasks require originality, and ethical concerns might disturb such high satisfaction.

RQ3: What are the main practices of AI in thesis Writing? Do they align with academic integrity?

To answer RQ3, we asked doctoral researchers about different practices that AI may be required for in academic writing. Brainstorming research ideas received a positive score of 65.0% making it a primary task that doctoral researchers use AI to perform, while 53.8% of researchers use AI for writing a tentative outline. Additionally, 42.5% indicated they used AI to review and provide feedback on their written manuscripts, 36.3% for generating hypotheses, and 35.0% employed AI for assistance with creating research bibliography. The two tasks that received relatively low scores are assisting in creating a research bibliography (35.0%) and designing experiments (31.3%). Interestingly, the top two results suggest that doctoral researchers primarily used AI for the initial stage of research, focusing on tasks that require simpler support.

Oliinyk et al. (2024) presented empirical findings on the impact of AI enhancement of research competence within five dimensions: substantive, design, procedural, optional, and communicative, with measured improvements on all. These fields include tasks that received a lower score in this study, like creating annotated bibliographies. Additionally, the research highlights other tasks, such as designing research models and algorithms, correlation analysis, drafting, and translating academic texts.

These tasks highlight the centrality of integrity. Doctoral researchers' answers indicate that the top answer was 'very aware' and on the lower end, as 'moderately aware' of AI capabilities. Both results are positive in keeping the academic conduct within ethical guidelines. 21.3% expressed their confidence in their knowledge of AI capabilities, and 31.3% expressed that their practices are aligning with honest conduct. Results suggest a holistic view which would emphasize how AI tools offer support for different academic tasks, but can never act to replace the human aspect, nor be used unethically. Further, clear guidelines with strategic implementation of AI into Moroccan academia shall yield more positive results, like encouraging transparency.

H_1: SMBAU PhD researchers use AI in academic writing.

The hypothesis is supported by results showing that most respondents reported using AI tools in their research tasks. Key activities such as brainstorming and outlining further strengthen the hypothesis and highlight the specific stages where AI is utilised in the writing process. In contrast, less reliance was shown for activities such as hypothesis generation, experimental design, and manuscript proofreading. The findings are in agreement with Rudolph et al.'s (2023) findings, which reported the success of implementing artificial intelligence, particularly ChatGPT, in academic writing. Furthermore, qualitative data collected through open-ended questions indicated that most postgraduates who use AI for writing depend on ChatGPT. Respondents emphasised the tool's efficacy in boosting productivity and workflow efficiency by demonstrating a variety of substantial benefits, which are mainly "*time-saving, flexibility in accessing information, brainstorming, paraphrasing, proofreading, checking redundancy, coherence, fact-checking, translation, and citation*." These findings indicate the extensive application of ChatGPT in academic assignments. Conversely, the results also supported the concerns expressed by Tomlison et al. (2023) regarding the validity of AI in performing tasks that require advanced critical thinking skills. One of the respondents testified, "*AI is merely a tool that assists us, while the ideas and*

innovations are from the researchers themselves." The same perspectives expressed by Algaraady and Mahyoob (2023), who elaborated that AI tools like ChatGPT are more effective in identifying surface-level errors (i.e., grammar, syntax, and spelling) compared to traditional grammar-checking software. Nonetheless, the tool is not able to assess deep structural and pragmatic mistakes, for instance, inconsistencies in tense, which are typically easier for human instructors to notice. Additionally, it may falsely suggest the non-existence of particular words that do exist. ChatGPT can also make incorrect inferences, requiring users and learners to exercise caution. Ethical issues, especially those related to plagiarism, as noted by Tomlison et al. (2023), pose questions for doctoral students regarding the use of AI tools in their dissertations. One of the students expressed the view that "*I think it is not bad to use AI if you know how to do it. You have to get ideas and try to rewrite them in your own words to prevent plagiarism.*" This response reflects concerns about the potential of AI-generated content to lead to instances of academic dishonesty. Respondents were unsure how to apply AI in a way that preserves academic integrity and were concerned about greater exposure to plagiarism detection through tools such as iThenticate.

H_2: SMBAU PhD researchers have a positive attitude toward using AI tools for academic research.

The data partially confirmed this hypothesis, given that most respondents held a neutral attitude toward AI, rather than one with strong positive connotations. Secondly, the modest positive correlation between attitudes and practices indicated that positive attitudes were somewhat associated with increased use of AI. The qualitative findings accounted for such ambivalence and scepticism in attitudes, pointing to three broad factors: 1) Uncertainty or lack of familiarity, 2) Perceived usefulness, and 3) Ethical concerns.

The initial factor may have contributed to neutral or ambivalent perceptions due to limited exposure or training about AI technologies. As one respondent stated, "*We should differentiate between types of AI because the AI used for writing is different from the AI used for data analysis and hypothesis testing*." This highlights the need for more training to fully comprehend the capabilities of AI tools. The second factor may be attributed to the respondents' attitudes regarding the advantages, reliability, limitations, and user-friendliness of artificial intelligence. As succinctly stated by one respondent, "*AI can help in research work like collecting information and translation, but cannot replace the critical thinking needed in research*." This suggests that while AI is viewed positively for specific tasks, respondents remain cautious about its broader use. The third factor covered concerns about plagiarism, dishonesty, and over-reliance on artificial intelligence software. One respondent clarified, "*AI is helpful in small tasks like paraphrasing or brainstorming, but I do not think that it can replace human effort when writing*." That concern aligns with research by Zou and Huang (2023), which found that perceived usefulness and ease of use significantly influence attitudes towards AI. Although AI tools are seen as helpful, there remains hesitation to fully adopt them for more complex academic tasks, especially writing and critical thinking.

H_3: SMBAU PhD researchers' conduct while using AI is ethical and aligns with academic honesty guidelines.

The third hypothesis is also moderately supported by both quantitative and qualitative data. Although respondents had a moderate level of awareness of AI ethical issues, their confidence in

upholding academic honesty was not reasonably assured due to the three previously clarified factors. Respondents expressed concerns about the ethical use of AI, particularly regarding plagiarism and excessive dependence on AI tools. A respondent opined, "*We should not use AI to research us; we must use it as a tool to accelerate it, but not to write our papers*." This quotation reflects a sound attitude towards the utilisation of AI in research, emphasising the importance of using AI tools ethically. Additionally, some respondents argued that AI should not be used as a substitute for original thought and intellectual input. As one respondent noted, "*Artificial Intelligence assists with research, but the ideas and creativity must be from the researcher*." This type of remark suggests that postgraduates acknowledge ethical issues; however, there are no clear guidelines or guarantees regarding AI use that fully uphold academic integrity. This result aligns with the moderate level of ethical awareness shown through the quantitative findings; however, the reassurance of ethical behaviour remains unclear, emphasising the need for more precise guidance on the ethical use of AI technology.

The research provided strong support for the first hypothesis and partial support for the second and third hypotheses, indicating the influence of specific limitations and suggesting several implications.

Limitations of the study

While the present study provides valuable data on the use of artificial intelligence technologies by Moroccan SMBAU PhD students, it is crucial to recognise and consider several limitations. The sample of 80 respondents might not be representative of the entire population, and therefore, the study's generalisability is limited. Additionally, relying on self-report data may introduce certain biases, such as social desirability bias or recall bias (e.g., the respondents overestimating or underestimating the actual use of AI). Although the findings were specific to certain artificial intelligence tools, most notably ChatGPT, their applicability extends to other AI tools used for academic writing assistance. Finally, the cross-sectional design prevents making causal inferences, as the researchers collected data at a single point in time. Therefore, more longitudinal studies are necessary to investigate changes over time and gain a clearer understanding of causal relationships.

Conclusion

The study revealed that most respondents were neutral about Generative AI, raising concerns about its ethical use in academic research. The debate over AI's impacts, digital literacy, and ethical issues in higher education is growing. To address unfamiliarity and plagiarism risks, AI literacy training is essential. Moroccan PhD students and others require training on the use and ethics of AI. Educating students on the responsible use of AI helps dispel stereotypes and harness the full potential of this technology. Tomlinson et al. (2023) suggested guidelines from professional bodies to govern AI-generated content, promote digital literacy, and reduce plagiarism. The University of Kansas recommends using AI for research questions, editing, and sourcing academic materials, emphasising proper prompts and critical thinking (Graduate Georgia Tech, 2023). Students are warned against using AI to write parts of their dissertations to avoid plagiarism and the dissemination of false information. They must also not share confidential or proprietary info, which could lead to IP violations and affect publishing (ibid). Major publishers, such as ACM, Elsevier, and Wiley, will not publish work co-authored or assisted by AI unless the authors disclose their use of AI. Paperpal, an AI writing tool, aims to enhance academic writing

and promote the responsible use of AI, emphasising AI as an augmentation tool, adhering to established policies, verifying outputs, and maintaining transparency (Paperpal, 2023). Algaraady and Mahyoob (2023) recommended using AI to augment, not replace, critical thinking, alongside independent research. Farrelly and Baker (2023) called for studies on the impact of AI on teaching. These guidelines support the ethical use of AI in universities, enhancing relevance and competitiveness, and encourage further research on the role of AI in higher education.

Funding: This research is not funded.
Acknowledgements: Not applicable.
Conflicts of Interest: The authors declare no conflict of interest.
Authenticity: This manuscript is an original work.
Artificial Intelligence Statement: Grammarly was utilised during the proofreading stage to enhance readability and clarity.

About the Authors

Fatima Zahra Aich is a second-year PhD student at Sidi Mohamed Ben Abdellah University-Faculty of Letters and Human Sciences, Sais, Fez, Morocco. She is an English teacher at Sidi Lahcen Lyoussi High School in Sefrou. She holds a CELTA certificate from the British Council, Casablanca. She is keen on exploring the application of artificial intelligence in education. https://orcid.org/0009-0007-0694-2743

Lahoucine Boumahdy, PhD researcher at Sidi Mohamed Ben Abdellah University -Faculty of Letters and Human Sciences, Dhar El Mahraz, Fez, Morocco. Fulbright Visiting Scholar at The Clorinda Donato Centre for Romance Languages and Translation Studies, California State University, Long Beach, USA. Senior Director of Multilingual Education at Cambridge University ReachSci Society, UK. https://orcid.org/0009-0004-5188-2725

Dr. Ismail Benfilali is an Associate Professor of General English and Applied Linguistics at Sidi Ben Abdellah University, Fez, Morocco. He holds a Doctorate in Applied Linguistics (2015) and has taught at Quincy College, Massachusetts. He also teaches English at the American Language Centre in Fez and has published works in linguistics and literature. https://orcid.org/0009-0000-0881-1359

Dr. Kebir Sandy is a Senior Professor of English at the Faculty of Letters and Human Sciences – Dhar El Mahraz in Sidi Mohamed Ben Abdellah University in Fez, Morocco. He serves as the Coordinator of the MA programme Translation and Cross-Cultural Communication and as the Director of the Laboratory for Sociological, Cultural and Philosophical Studies.
https://orcid.org/0009-0001-5321-1114

References

Abdul Rahman, N. A., Zulkornain, L. H., Che Mat, A., & Kustati, M. (2023). Assessing writing abilities using AI-powered writing evaluations. *Journal of ASIAN Behavioural Studies, 8*(24), 1–17. https://doi.org/10.21834/jabs.v8i24.420

Alberth. (2023). The use of ChatGPT in academic writing: A blessing or a curse in disguise? *TEFLIN Journal - A publication on the teaching and learning of English*, *34*(2), 337–352. https://doi.org/10.15639/teflinjournal.v34i2/337-352

Algaraady, J., & Mahyoob, M.(2023). ChatGPT's capabilities in spotting and analyzing writing errors experienced by EFL learners. *Arab World English Journal (AWEJ) Special Issue on CALL* (9)3–17. https://dx.doi.org/10.24093/awej/call9.1

Alqahtani, N., & Wafula, Z. (2025). Artificial intelligence integration: Pedagogical strategies and policies at leading universities. *Innovative Higher Education*, *50*(2), 665–684. https://doi.org/10.1007/s10755-024-09749-x

Al-Zubaidi, K., Jaafari, M., & Touzani, F. Z. (2024). Impact of ChatGPT on academic writing at Moroccan universities. *Arab World English Journal (AWEJ)* Special Issue on ChatGPT, April 2024: 4–25. https://doi.org/10.24093/awej/chatgpt.1

Bai, X., Zhang, F., Liu, J., Wang, X., & Xia, F. (2025). Revolutionizing scholarly impact: Advanced evaluations, predictive models, and future directions. *Artificial Intelligence Review*, *58*(10). https://doi.org/10.1007/s10462-025-11315-6

Baidoo-Anu, D., & Owusu Ansah, L. (2023). *Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning* (SSRN Scholarly Paper No. 4337484). Social Science Research Network. https://doi.org/10.2139/ssrn.4337484

Balel, Y. (2023). The role of artificial intelligence in academic paper writing and its potential as a co-author: Letter to the editor. *European Journal of Therapeutics*, *29*(4), 984–985. https://doi.org/10.58600/eurjther1691

Boubker, O. (2024). From chatting to self-educating: Can AI tools boost student learning outcomes? *Expert Systems with Applications*, *238*, 121820. https://doi.org/10.1016/j.eswa.2023.121820

Boubker, O. (2024). Examining the impact of OpenAI's ChatGPT on PhD student achievement. *International Journal of Information and Education Technology*, *14*(3), 443-451. https://doi.org/10.18178/ijiet.2024.14.3.2065

Bouzar, A., EL Idrissi, K., & Ghourdou, T. (2024). ChatGPT and academic writing self-efficacy: Unveiling correlations and technological dependency among postgraduate students. *Arab World English Journal (AWEJ)* Special Issue on ChatGPT, April 2024: 225–236. https://dx.doi.org/10.24093/awej/ChatGPT.15

Buriak, J. M. et al. (2023). Best practices for using AI when writing scientific manuscripts: Caution, care, and consideration: Creative science depends on it. *ACS Nano 2023, 17(*5), 4091–4093. https://doi.org/10.1021/acsnano.3c01544

Chen, T. (2023). ChatGPT and other artificial intelligence applications speed up scientific writing. *Journal of the Chinese Medical Association*, *86*(4), 351–353. https://doi.org/10.1097/jcma.0000000000000900

El Hazzat, S., EL KIRAT EL ALLAME, Y., & FAIZI, R. (2024). ICT adoption in Moroccan higher education: key predictors of students' technology acceptance and usage. *Moroccan Journal of Quantitative and Qualitative Research*, *6*(4). https://doi.org/10.48379/IMIST.PRSM/MJQR-V6I4.53006

Farrelly, T., & Baker, N. (2023). Generative artificial intelligence: Implications and considerations for higher education practice. *Education Sciences*, *13*(11), 1109. https://doi.org/10.3390/educsci13111109

Guidance for effective and responsible use of AI in research. (n.d.). Georgia Tech. https://gatech.servicenow.com/home?id=kb_article_view&sysparm_article=KB0044077

Halaweh, M. (2023). ChatGPT in education: Strategies for responsible implementation. *Contemporary Educational Technology*, *15*(2), 1-11. https://doi.org/10.30935/cedtech/13036

Liebrenz, M., Schleifer, R., Buadze, A., Bhugra, D., & Smith, A. (2023). Generating scholarly content with ChatGPT: Ethical challenges for medical publishing. *The Lancet Digital Health, 5*(3), E105-E106. https://doi.org/10.1016/s2589-7500(23)00019-5

Luca Liehner, G., Hick, A., Biermann, H., Brauner, P., & Ziefle, M. (2023). Perceptions, attitudes and trust toward artificial intelligence — An assessment of the public opinion. *AHFE International*. https://doi.org/10.54941/ahfe1003271

Moussa, A., & Belhiah, H. (2024). Beyond syntax: Exploring Moroccan undergraduate EFL learners' engagement with AI-assisted writing. *Arab World English Journal (AWEJ), Special Issue on ChatGPT, April 2024*, 138–155. https://doi.org/10.24093/awej/ChatGPT.9

Oliinyk, I., Bulavina, O., Romanenko, T., Tatarnikova, A., & Smirnov, A. (2024). Artificial intelligence in developing doctoral students' research competencies. *Eduweb*, *18*(3), 294–305. https://doi.org/10.46502/issn.1856-7576/2024.18.03.22

Paperpal. (2023, December 21). *The do's & don'ts of using generative AI tools ethically in academia*. https://shorturl.at/47AYB

Pavlik, J. V. (2023). Collaborating with ChatGPT: Considering the implications of generative artificial intelligence for journalism and media education. *Journalism & Mass Communication Educator*, *78*(1), 84-93. https://doi.org/10.1177/10776958221149577

Pinzolits, R. (2023). AI in academia: An overview of selected tools and their areas of application. *MAP Education and Humanities*, *4*, 37–50. https://doi.org/10.53880/2744-2373.2023.4.37

Romero-Rodríguez, J., Ramírez-Montoya, M., Buenestado-Fernández, M., & Lara-Lara, F. (2023). Use of ChatGPT at University as a tool for complex thinking: Students' perceived usefulness. *Journal of New Approaches in Educational Research*, *12*(2), 323–339. https://doi.org/10.7821/naer.2023.7.1458

Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning and Teaching*, *6*(1), 342–363. https://doi.org/10.37074/jalt.2023.6.1.9

Salvagno, M., Taccone, F. S., & Gerli, A. G. (2023). Can artificial intelligence help with scientific writing? *Critical Care*, *27*(1), 1–5. https://doi.org/10.1186/s13054-023-04380-2

Stai, B. et al. (2020). Public Perceptions of Artificial Intelligence and Robotics in Medicine. *Journal of Endourology*, *34*(10), 1041–1048. https://doi.org/10.1089/end.2020.0137

Tomlinson, B., Torrance, A. W., & Black, R. W. (2023). ChatGPT and works scholarly: Best practices and legal pitfalls in writing with AI. *SMU Law Review Forum*, *76*(1), 108. https://doi.org/10.25172/slrf.76.1.5

Van Dis, E. A., Bollen, J., Zuidema, W., Van Rooij, R., & Bockting, C. L. (2023). ChatGPT: Five priorities for research. *Nature*, *614*(7947), 224-226. https://doi.org/10.1038/d41586-023-00288-7

Wagner, G., Lukyanenko, R., & Paré, G. (2022). Artificial intelligence and the conduct of literature reviews. *Journal of Information Technology*, *37*(2), 209–226. https://doi.org/10.1177/02683962211048201

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, *16*(1). https://doi.org/10.1186/s41239-019-0171-0

Wagner, G., Lukyanenko, R., & Paré, G. (2022). Artificial intelligence and the conduct of literature reviews. *Journal of Information Technology*, *37*(2), 209–226. https://doi.org/10.1177/02683962211048201

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, *16*(1). https://doi.org/10.1186/s41239-019-0171-0

Zou, M., & Huang, L. (2023). To use or not to use? Understanding doctoral students' acceptance of ChatGPT in writing through the technology acceptance model. *Frontiers in Psychology*, *14*, 1259531. https://doi.org/10.3389/fpsyg.2023.1259531