AI and learning experiences of international students studying in the UK: an exploratory case study

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Abstract

Purpose – This study aims to explore how artificial intelligence (AI) tools influence the academic success and adaptation of international students in higher education. It examines the benefits, challenges and ethical considerations including academic integrity of integrating AI in learning environments.

Design/methodology/approach – An exploratory qualitative research approach was employed, utilising semi-structured interviews with postgraduate international students from diverse backgrounds.

Findings – The findings suggest that AI tools enhance academic performance by offering personalised learning, immediate feedback and efficient assessment. However, concerns about ethical use, over-reliance and the potential impact on critical thinking and academic integrity were prominent in the contexts of assessments and learning experiences.

Originality/value – The research offers unique insights by focusing on postgraduate international students, an often-underrepresented group in AI education studies. Their distinctive challenges, including adapting to new academic environments and overcoming language barriers, make them a particularly valuable sample for understanding the role of AI in higher education. This focus allows the study to contribute new perspectives on how generative AI (GenAI) tools like Grammarly and ChatGPT facilitate academic performance improvement, especially in enhancing writing proficiency and managing academic expectations. These findings extend the discussion by specifically addressing the experiences of international students in postgraduate studies, a demographic where AI's impact has been less explored.

Keywords Artificial intelligence, Higher education, International student, Learning experience, ChatGPT

Paper type Research paper

Introduction

The integration of artificial intelligence (AI) in higher education has rapidly expanded, particularly in supporting international students facing challenges such as language barriers, cultural adaptation and unfamiliar academic standards. AI tools, such as ChatGPT and Grammarly, have gained prominence as educational aids, offering support in writing, research and critical thinking (Chan and Hu, 2023). Initially introduced to handle administrative tasks, AI has now evolved into a crucial tool for enhancing the learning experiences of diverse student populations. International students often encounter significant obstacles in higher education, including difficulties in understanding lectures, completing assignments and adjusting to new teaching methods (Wang *et al*., 2023). AI technologies are increasingly being leveraged to address these issues by providing personalised, culturally sensitive learning experiences that can significantly improve academic performance and integration into foreign educational environments (Gautam *et al*., 2016).

With the global number of international students projected to reach eight million by 2025 (Wang *et al*., 2023), the use of AI to support their educational journeys has become a critical area of focus. Higher education institutions, particularly in English-speaking countries, are increasingly relying on technology to attract and retain international students, who are essential to institutional financial stability and campus diversity. However, despite the

widespread adoption of AI in education, its specific impact on international students' academic achievement and learning processes remains underexplored. Postgraduate students, in particular, face distinctive academic challenges that set them apart from undergraduate learners. These challenges include the need to conduct independent research, engage in critical thinking and meet advanced academic standards (Creswell, 2015). For international postgraduate students, these demands are heightened by the need to navigate unfamiliar academic systems and linguistic barriers. AI tools, such as ChatGPT and Grammarly, provide critical support in these areas by enhancing language proficiency, facilitating research organisation and generating ideas (Farrelly and Baker, 2023). However, the extent to which these tools foster academic independence versus creating over-reliance remains a key question. By focusing on postgraduate students, this study seeks to uncover how AI tools align with or challenge the goals of advanced education, particularly in fostering critical thinking, independent research skills and academic integrity.

Building on these foundations, this research explores the key question of how AI tools influence the academic journeys of postgraduate international students. By examining perceptions and experiences through qualitative methods, the study identifies both the benefits of AI integration, such as improved language proficiency and time management and challenges like over-reliance and concerns about data privacy. This paper critically evaluates how AI supports international students in overcoming language barriers, adapting to new academic standards and managing their workload effectively. Additionally, it highlights the potential drawbacks of AI use, particularly in fostering dependency and the risk of undermining critical thinking. Central to this investigation is the interplay between AI use and academic integrity, particularly in the context of assessments as a learning tool. Postgraduate education emphasises assessments not only as measures of performance but also as opportunities for intellectual growth, critical reflection and the development of independent research skills (Boud, 2000). The integration of AI into these processes raises critical questions about ethical use and its influence on learning outcomes. This study critically examines how AI tools are used by international postgraduate students to navigate assessments, considering both the benefits and potential limitations, such as fostering dependency and diminishing critical engagement (ONeill and Russell, 2019). The contribution of this research lies in its comprehensive analysis of AI's role in facilitating international students' academic integration. The study provides evidence that AI can significantly enhance writing and grammar skills, support academic adjustments and improve time management. Moreover, it identifies the need for universities to implement clear guidelines and training on AI usage, ensuring that students maximise its benefits while avoiding over-dependence. This research contributes to the growing body of literature on AI in higher education by focusing on international students, a group that faces unique challenges and offers valuable recommendations for optimising AI's role in supporting their academic success.

This work's broader significance lies in addressing gaps in understanding how AI can be most effectively used to support international students. Its findings offer a practical roadmap for educational institutions to harness AI in ways that promote academic integrity, critical thinking and independent learning, thereby fostering a more inclusive and effective educational environment. The study's insights can inform the development of AI-driven policies and training programs aimed at enhancing the educational experiences of international students globally.

Literature review and theoretical discussion

AI has seen rapid adoption across higher education sectors, offering significant potential for improving learning outcomes, administrative efficiency and student experiences. AI's ability to personalise learning, automate processes and enhance engagement is a major advantage for international students, who often face unique challenges related to language barriers, cultural adjustments and academic integration. However, alongside the promise of AI, significant

concerns about its ethical use, reliance on technology and impacts on critical thinking are emerging. This literature review critically examines AI's potential in higher education, focusing on its benefits for international students while highlighting the challenges that must be addressed for equitable implementation.

AI encompasses a broad range of technologies that simulate human intelligence, including machine learning, natural language processing and adaptive algorithms (Russell and Norvig, 2016). In educational contexts, AI systems are increasingly applied to facilitate knowledge management, automate administrative tasks and personalise learning experiences (Chen *et al*., 2020). The ability of AI to adapt to individual learning styles and deliver customised content is particularly beneficial for international students, who often struggle with traditional teaching methods that do not account for diverse educational backgrounds or learning preferences (Sarker, 2022).

However, while AI holds promise in reshaping education, its implementation has been met with concerns about the oversimplification of complex learning needs. Holzinger (2018) suggests that AI's focus on efficiency risks undermining the role of educators in providing nuanced, context-sensitive support, especially for students from diverse cultural and linguistic backgrounds. As such, it is crucial to strike a balance between AI-driven efficiency and the need for human oversight in educational settings.

The application of AI in supporting international students

AI has dramatically transformed the learning experience for international students by addressing key challenges, such as language barriers, academic integration and cultural adaptation. Recent studies highlight the effectiveness of AI tools in providing real-time support, particularly for students with limited proficiency in the language of instruction. AI-driven tools, including automated translation services, language learning platforms and text-to-speech software, offer invaluable support, enhancing students' ability to comprehend academic content (Du and Daniel, 2024). These tools not only assist in translation but also enable better engagement with complex materials, facilitating academic success in foreign educational environments (Islamov, 2021; Ma *et al*., 2024).

AI's ability to provide personalised and immediate feedback further strengthens its role in supporting international students. Adaptive learning platforms, powered by machine learning algorithms, assess individual student progress in real-time and offer targeted recommendations to enhance learning outcomes (Khan *et al*., 2021). These personalised learning systems are critical for international students, who often have varied educational backgrounds and learning styles, helping them adjust to different academic expectations. By dynamically adapting to students' individual learning needs, AI-driven platforms can ensure that students receive the right level of support, allowing them to focus on areas requiring improvement (Nazari *et al*., 2021; Singh *et al*., 2022). AI tools such as virtual assistants also play a pivotal role in easing the transition into new academic environments. Research by McLean and Osei-Frimpong (2019) shows that AI virtual assistants provide essential support during the enrolment process and help in navigating administrative tasks such as course registration and visa requirements. These AI systems are designed to reduce the cognitive load associated with adjusting to new academic and cultural settings, streamlining bureaucratic processes that can be overwhelming for students from diverse backgrounds. In this way, AI alleviates the administrative burden, allowing international students to focus more on their studies.

AI technologies are increasingly being used to support international students from diverse cultural backgrounds and with varying academic performance levels. For instance, adaptive AI tools now take into consideration cultural nuances and linguistic differences, offering tailored solutions that align with students' specific academic needs. This cultural sensitivity allows AI to support students more effectively, especially those from non-Western educational systems (Ma *et al*., 2024). Peng *et al*. (2023) highlight how AI tools enhance reading

comprehension and language acquisition for international students, enabling them to meet academic expectations more easily, regardless of their cultural or linguistic background. By offering personalised learning pathways, AI ensures that international students receive an equitable education experience tailored to their unique learning contexts (Chen *et al*., 2020; Singh *et al*., 2022).

While the benefits of AI for international students are clear, concerns remain regarding the over-reliance on these tools. Islamov (2021) cautions that extensive dependence on AI for tasks such as translation and grammar correction may reduce students' engagement with critical thinking and deeper cognitive processes. Automated tools like Grammarly or real-time translation systems are helpful in overcoming language barriers but may inadvertently foster a passive learning environment. This over-reliance could hinder the development of essential language and cognitive skills necessary for academic success in the long term (Chan and Hu, 2023). Students may become accustomed to AI doing the intellectual heavy lifting, which might limit their ability to perform without technological assistance.

One of AI's greatest strengths in higher education is its capacity to deliver personalised learning experiences. AI-powered systems like machine learning algorithms and adaptive learning platforms are designed to customise content delivery based on the student's performance, preferences and progress (Chen *et al*., 2020). For international students, personalised learning pathways are crucial, given their varied educational backgrounds. These platforms help students identify their strengths and weaknesses, ensuring that they can move through academic content at their own pace (Nazari *et al*., 2021). AI's role extends beyond just supporting individual learning; it also facilitates institutional knowledge management. AI-powered systems organise vast amounts of academic resources, making it easier for international students to access relevant materials and navigate complex academic environments (Razia *et al*., 2022). However, some critics argue that while AI enhances knowledge management, it also risks depersonalising the learning experience. Baashar *et al*. (2022) contend that the increased reliance on AI systems may reduce human interaction, which is essential for a holistic learning experience. While AI provides technical efficiency, the absence of human oversight and personalised educator–student relationships may weaken the support structures that international students rely on when adjusting to new academic settings (Farrelly and Baker, 2023). AI should, therefore, complement rather than replace traditional forms of human academic support, ensuring that international students receive both technological and interpersonal guidance.

The application of AI in supporting international students is a double-edged sword. On the one hand, it offers personalised, adaptive learning pathways that are essential for helping international students overcome linguistic and cultural barriers. On the other hand, the risks of over-reliance on AI and the depersonalisation of education must be carefully managed. As educational institutions increasingly integrate AI technologies, it is crucial that these tools are used responsibly, ensuring that they enhance rather than hinder the academic and cognitive development of international students.

Academic integrity is a cornerstone of higher education, particularly at the postgraduate level, where students are expected to engage in independent research and critical analysis (Boud, 2000). The growing use of AI tools such as ChatGPT and Grammarly in assessments raises significant ethical concerns. While these tools offer valuable support in refining language, generating ideas and facilitating research, they can also inadvertently enable academic misconduct by allowing students to present AI-generated content as their own work (ONeill and Russell, 2019). The role of AI in postgraduate assessment intersects with its influence on learning processes. Assessments, traditionally viewed as opportunities for intellectual growth and skill development, risk becoming procedural tasks when students overly rely on AI tools. Studies by Farrelly and Baker (2023) suggest that while AI enhances efficiency in completing assignments, it may hinder the development of essential cognitive and critical thinking skills by reducing the need for students to engage deeply with the material. Additionally, ethical concerns about academic integrity extend to how AI is used in formative

and summative assessments. Research by Chan *et al*. (2023) highlights that AI tools can provide real-time feedback, improving learning outcomes, but they also risk creating dependency. This is particularly problematic in postgraduate education, where assessments are designed to foster autonomy and critical engagement with academic content. To address these issues, Michel-Villarreal *et al*. (2023) recommend the inclusion of reflective components in assessments, such as self-evaluation or oral defences, to ensure students actively engage with their learning rather than passively relying on AI outputs. Universities must play a proactive role in addressing these challenges by implementing clear guidelines on the ethical use of AI in assessments. Training programmes focused on academic integrity, combined with redesigned assessment structures that integrate AI responsibly, are essential to maintaining the balance between leveraging technology and upholding educational values (Boud, 2000; Hänel and Söllner, 2023).

The benefits of AI for international students

AI's potential to transform the learning experiences of international students cannot be overstated. The ability of AI systems to provide personalised, immediate feedback is a critical benefit for students who may struggle with traditional teaching methods (Khan *et al*., 2021). AI-powered platforms, such as ChatGPT, offer opportunities for students to practice language skills, receive writing feedback and engage in discussions that would otherwise be inaccessible (Michel-Villarreal *et al*., 2023). These tools are particularly valuable for international students, who often require additional support to overcome language-related challenges and adapt to different academic expectations (Peng *et al*., 2023).

Furthermore, AI technologies such as adaptive learning platforms and virtual assistants help reduce the administrative burden on international students, allowing them to focus more on their studies. Pawar and Vispute (2023) highlight the role of AI voice assistants in streamlining the enrolment process for international students, reducing psychological and monetary costs associated with navigating complex academic systems. AI systems also provide students with real-time updates on their academic performance, helping them stay on track and seek support when needed (Nazari *et al*., 2021).

Despite these advantages, concerns remain about the potential risks associated with AI use. AI tools such as Grammarly and ChatGPT, while valuable for improving writing and language skills, can inadvertently encourage students to rely too heavily on automated systems for academic tasks (Chan and Hu, 2023). There is a growing concern that such over-reliance on AI could hinder the development of critical thinking and problem-solving skills, which are essential for academic success (Koltovskaia, 2020).

While AI provides significant benefits, its widespread use raises important ethical concerns, particularly around data privacy, bias and access to technology. International students, who often rely on digital tools to support their studies, are particularly vulnerable to data privacy breaches (Farrelly and Baker, 2023). AI systems that collect and analyse personal data must be carefully regulated to ensure that students' privacy is protected.

Additionally, the biases embedded in AI algorithms pose significant challenges for international students. Chan and Hu (2023) argue that AI systems, trained on biased datasets, may reinforce existing inequalities in education, particularly for students from non-Western backgrounds. AI-based grading systems, for example, have been found to penalise students from non-English-speaking countries due to language differences that the algorithms fail to account for (Guo and Chase, 2011). Addressing these biases is critical to ensuring that AI technologies are used equitably in higher education.

Finally, the issue of the digital divide cannot be overlooked. Access to AI technologies is uneven, with students from lower socioeconomic backgrounds often lacking the resources needed to benefit from these tools (Zhang and Aslan, 2021). This divide is particularly pronounced among international students, many of whom come from countries with less

advanced technological infrastructures. As AI becomes more integrated into education, it is essential to ensure that all students have equal access to its benefits (Farrelly and Baker, 2023).

AI offers tremendous potential to improve the educational experiences of international students by personalising learning, overcoming language barriers and providing real-time support. However, these benefits must be weighed against the ethical concerns and practical challenges associated with AI use. As educational institutions increasingly adopt AI technologies, it is crucial to address issues of data privacy, algorithmic bias and the digital divide to ensure that AI is implemented equitably and responsibly. Future research should explore how AI can be further adapted to meet the needs of diverse student populations while preserving the essential human elements of education, particularly in fostering critical thinking and intellectual autonomy.

Sample and methods

To capture diverse perspectives, convenience sampling was employed. This method, while non-random, allowed for the selection of a diverse group of international postgraduate students studying at a UK higher education institution. Convenience sampling was particularly useful for accessing participants readily available and willing to share their experiences with AI in education (Sedgwick, 2013). The final sample size constituted 12 students. While the limitations of convenience sampling are acknowledged, particularly regarding the representativeness of the findings, it provided a practical solution for this exploratory study focused on specific, lived experiences. These students were chosen because they represent a key demographic in understanding the role of AI in supporting academic performance, particularly as they face unique challenges such as language barriers and cultural adaptation.

To further clarify the sample characteristics, we have included a table (see Table 1) presenting key demographic information such as students' country of origin, academic discipline and language proficiency. This detailed demographic data highlights the diversity within the sample, showcasing the varied cultural and linguistic backgrounds of the participants. Including this information allows for a better understanding of how AI tools meet the needs of students with different academic and cultural experiences.

Semi-structured interviews were conducted online, ensuring that students from various academic disciplines and geographic locations could participate. Each interview lasted between 20 and 25 min, allowing for a flexible exploration of students' interactions with AI tools. The interview structure balanced open-ended questions with focused prompts, providing

Table 1. Interviewee details

Participants no	Country	Course	Level of education	Gender	Age
P1	Nigeria	International Business and Management	MSc	F	25
P2	Syria	Management	MSc	M	24
P3	Turkey	Civil Engineering	MSc	M	30
P4	Morocco	Investments in Finance	MSc	F	23
P5	Algeria	Drug Discovery Delivery and Development	MSc	F	26
P6	China	Digital Business	MSc	F	25
P7	France	International Business and Management	MSc	M	23
P8	India	International Business and Management	MSc	F	25
P9	Iran	International Business and Management	MSc	F	40
P10	Algeria	International Business and Management	MSc	F	29
P11	Turkey	Artificial Intelligence	MSc	M	24
P12	India	Embedded Systems and IC Design	MSc	M	25

Source(s): Authors' own work

the interviewer with the flexibility to delve deeper into topics such as the perceived benefits of AI tools, the challenges students faced and how AI impacted their learning processes (DeJonckheere and Vaughn, 2019). The exploratory nature of the study aligns with the research question: "How do postgraduate international students use AI tools in their academic work, and what implications does this have for their learning experiences and academic integrity?" This approach not only highlights the participants' perspectives but also provides a foundation for future research on the integration of AI in postgraduate education.

Research method and approach

A qualitative research approach was selected to provide an in-depth exploration of the experiences and perceptions of international students regarding AI tools in their education. Qualitative methods allow for the investigation of complex, contextual factors that influence how students engage with these technologies (Creswell, 2015; Haj Youssef and Teng, 2021; Wasim *et al*., 2024a, b). Semi-structured interviews were utilised, as they offer flexibility to explore students' unique interactions with AI, capturing the personal and often nuanced aspects of their educational journeys (Christodoulou *et al*., 2024; Wasim *et al*., 2024a, b; Sutton and Austin, 2015).

This research was guided by an interpretivist philosophical stance, which recognises the importance of understanding human experiences within specific contexts (Alharahsheh and Pius, 2020). In contrast to positivism, which prioritises generalisable findings, this approach seeks to uncover the subjective meanings that international students attach to their use of AI technologies in their academic environments. Given the focus on individual experiences, qualitative methods were chosen over quantitative approaches, which are less suited to capturing the depth and complexity of student interactions with AI (Goertzen, 2017).

Data collection

Data were collected through 12 semi-structured interviews conducted via a secured online platform, ensuring anonymity and confidentiality for all participants. The interview guide was designed to elicit detailed responses about students' experiences with AI in their education, focusing on how AI tools supported their academic work, particularly in overcoming language and cultural barriers. Open-ended questions allowed participants to discuss their perceptions of AI's impact on their academic performance and critical thinking skills. All interviews were recorded, transcribed and anonymised to protect participants' identities. The use of online interviews allowed for flexibility and accessibility, ensuring that participants could engage comfortably regardless of their physical location. The interviews were conducted between June and Aug 2024, with each interview lasting approximately 25–30 min. These interviews were designed to explore students' interactions with AI tools, with a focus on the perceived benefits, challenges and overall impact on academic performance.

Research instrument

An interview schedule (please see supplementary materials) was used as the primary research instrument, covering key themes such as the practical use of AI tools and their perceived educational benefits and challenges. The first part of the interview established rapport and gathered background information on the participants' academic status, while the second part focused on how AI tools influenced their studies. Open-ended questions like "What AI tools do you find most beneficial in your studies?" and "How have these tools impacted your academic experience?" were used to elicit comprehensive responses. The final section of the interview explored challenges and limitations, asking participants to reflect on any difficulties they faced in using AI tools and to suggest potential improvements. This section also encouraged students to share their views on how AI could be further integrated into education to support international students more effectively.

Data analysis

The data were analysed using thematic analysis, following the six-phase approach outlined by Clarke and Braun (2017). This method was selected for its flexibility and its ability to capture recurring patterns and themes in the data. The analysis process began with familiarisation with the data, followed by the generation of initial codes and the identification of overarching themes. These themes were reviewed, refined and ultimately defined to provide a comprehensive understanding of the participants' experiences. Thematic analysis was chosen for its methodological rigour and adaptability, making it particularly well-suited for exploring complex, qualitative data. This approach facilitated a nuanced interpretation of how AI technologies affect international students, highlighting both the positive impacts and the challenges they face.

Ethical considerations were strictly adhered to throughout the research process. Prior to each interview, participants were provided with an interview consent form, a participant information sheet and an invitation to participate. These documents outlined the research objectives, participants' rights and assurances of confidentiality. Participants were informed that their involvement was voluntary and that they could withdraw from the study at any time without consequence. To protect participants' privacy, all data were anonymised, and no personally identifiable information was included in the transcriptions. All interview recordings and transcripts were securely stored, and no data were shared with third parties. Ethical approval for the study was obtained from the relevant ethics committee at the UK higher education institution, ensuring compliance with institutional and national guidelines.

Findings

The analysis of 12 semi-structured interviews revealed 5 main themes regarding international students' use of AI tools within their academic environments. These themes include the usage of AI tools for academic purposes, the impact of AI on learning, challenges and limitations in AI use, adjustment to new academic environments and the role of AI in language proficiency and communication. Throughout these themes, participants reflected on how AI influences their academic performance, learning processes and overall integration into UK higher education.

Theme 1: usage of AI tools for academic purposes

A significant theme that emerged was the perceived benefit of AI in improving academic writing. Most participants (10 out of 12) noted that AI tools such as Grammarly and ChatGPT helped them refine their writing, particularly in areas like structure, coherence and generating ideas. For many international students, writing in English posed a challenge, especially when attempting to meet the academic standards expected in the UK. Participants reported that AI tools alleviated some of these difficulties by providing real-time feedback and suggesting ways to enhance their writing. Overall, the use of AI tools had a positive influence on academic writing, aiding in idea development, content paraphrasing and mastering new writing styles. Participant 1 illustrated this by sharing:

> Writing, especially when it comes to my writing skills, I could say AI improved it. Went a long way to improve it and I was less stressed with how to like construct grammars in my head.

Moreover, Participant 4 highlighted how AI tools can enhance writing by aiding in idea development, content paraphrasing and mastering new writing styles, stating:

> . . .And I was also able to learn how to write new things such as an introduction. Or like a, a proposal or all those differences and how to it would give me for instance examples of how to write research questions.

Participant 7 also demonstrated this by saying:

> . . . So basically, when I had like some work to do, I mostly used the AI tools as a writing assistant, to be honest.

The research revealed that grammar correction is one of the primary benefits of using AI tools among international students at Liverpool John Moores University. Out of 12 participants, 11 mentioned using AI tools for correcting grammatical errors, apart from Participant 8 from India. The participants frequently used AI tools such as Grammarly and ChatGPT to enhance their writing by identifying and correcting grammatical errors, thereby improving the clarity and quality of their academic work.

Participant 6 explained the process in detail:

> For Grammar fixing like to do the academic grammar, like most of my assignment, require me to use an academic way to write my report or even some tasks, so I will use Grammarly to fix that.

Participant 7 noted:

> In my opinion the best usage of AI would be to get like grammar correction. . . to have a cohesive structure of the work.

Participants mentioned that the primary use of AI tools was to improve writing structure and punctuation, resulting in more coherent academic work. The utilisation of AI tools enhances both writing quality and academic performance.

Summarising articles. Out of 12 participants, 7 used AI tools to enhance efficiency in reading and understanding complex documents (P2, P4, P5, P6, P8, P9 and P10). In contrast, participants from Nigeria, Turkey and France did not mention using AI for this purpose, showing varied reliance on AI for summarisation. These tools simplify difficult language and layouts, summarise lengthy papers and highlight key points. AI provides quick explanations of complex concepts, which is particularly helpful for non-English speakers. It also aids in organising ideas, making academic papers and reports more readable. Users can extract specific information by inputting questions, obtaining direct answers without reading the entire text. Female participants were more likely to use AI tools for this purpose. Male participants, on the other hand, were less likely to mention using AI for this purpose, with only P2 from Syria noting its importance in handling complex documents. Overall, AI tools are invaluable for efficient studying and research.

Participant 4 illustrated this by saying:

> . . .With the AI and ask it to summarise the paper or to find some key points that you could miss when reading. AI tools have allowed me to be more efficient in my studying.

Participant 9 added:

> I use it for summarised long paragraphs or when I have a lot of ideas in my mind.

AI tools enhance study productivity by condensing elaborate papers and emphasising crucial details, enabling students to efficiently retrieve necessary information without reading the entire articles. Participant 10 mentioned:

> So, I have used it to summarise my articles. So, either it was summarising or if I want to know any information from that article, I just typed my question and it just give you the answer from the article to without having to read it.

Personal feedback. In terms of using AI for personal feedback, female participants were more likely to use AI tools (P4, P5, P6, P8 and P9). The male participants who used AI for personal feedback were P2 (Syria) and P3 (Turkey). ChatGPT offered detailed advice on assignments, while Grammarly provided instant corrections. These tools enhanced writing skills, improved academic performance, ensured proper usage and offered constructive feedback. AI tools played a crucial role in delivering feedback that improved both academic performance and understanding.

Participant 8 mentioned how they used it as a feedback tool:

> After I was done with it with my draft, I would put it into ChatGPT and ask it to give me feedback on how I can improve the assignment to get a certain grade. I asked ChatGPT to give me feedback on my assignment and asked it to give me an explanation of how I can get a distinction grade on that assignment. I worked on my assignment according to the feedback I got from ChatGPT, and I ended up getting 70 plus on that assignment.

Participant 3 added:

> Well, AI driven writing assistance like Grammarly provide instant feedback on essays and reports, improving my writing skills and grades.

A key point discovered within the data was that AI tools significantly enhance academic tasks by aiding in idea generation and brainstorming, thereby boosting creativity. Participant 2 illustrated this by saying:

> I used it for generating ideas ... it helped me brainstorm.

Furthermore, it was discovered that AI tools enhance learning interactivity and engagement by providing prompt responses to questions. Participant 5 mentioned:

> Using AI has made my life easier because they have made me like my learning more interactive. I can just ask questions and get immediate responses which helps me engage more deeply with the course materials.

Theme 2: impact on learning

Participants generally noted that AI tools improve time management by automating tasks and speeding up data analysis, ultimately enhancing productivity. Mostly female participants mentioned the role of AI in improving time management. Out of the seven participants who discussed time management, five were female (P4, P5, P6, P8 and P10), while only two were male (P2 and P3). Participants from Syria, Turkey, Morocco, Algeria, China and India mentioned using AI for time management, helping them manage their academic workloads more effectively. In contrast, participants from Nigeria, France, Iran and some from Turkey and India did not specifically mention using AI for this purpose. Overall, female participants from Africa and Asia valued AI more for managing their workloads.

Participant 8 illustrated this by saying:

> . . .I put in my assignment details and everything, and I asked ChatGPT to give me a timeline of basically how I can manage time to finish all these assignments on time, plus halftime to improve them and to get a good grade and ChatGPT gave me a timetable of how much I was supposed to do every day so I would have enough time and that helped me a lot because it helped me manage time.

Participant 4 added:

> I would in the past when I didn't use AI tools, I would have to spend an hour, an hour and a half just reading the paper, just trying to figure out if I get all the points.

One key discovery from the participants is that, when used appropriately, AI tools can greatly assist students in efficiently managing their academic studies and research. Participant 5 noted:

> . .But I do think that when they're used in a sensible way they can be of great help, and they can provide especially students with time-efficient ways to manage their studies and their research.

Participant 7 noted:

> For me it was a tool mostly used to learn faster and not waste time.

Critical thinking. Six participants, mostly females from Nigeria, Turkey, Morocco, France, India and Algeria, found AI tools beneficial for improving critical thinking. Participants

mentioned the positive impact of AI on their learning experiences, highlighting benefits such as improved efficiency and enhanced learning resources. However, four participants, mostly males, noted negative impacts, citing concerns such as potential dependency and reduced critical thinking skills (P2, P6, P11 and P12). Two female participants (P5 and P9) expressed mixed views, acknowledging both the advantages and disadvantages of AI, such as over-reliance as a negative impact.

One key discovery was that AI has enhanced the critical thinking abilities of participants, particularly because their previous educational institutions did not emphasise this skill, leading to challenges in adjusting to a new academic setting. Participant 8 responded:

> I do believe that AI has improved my critical thinking skills. Absolutely. I come from a background where critical thinking was not part of the education system. So, coming to England and studying in an educational background like this, like the one that we are currently in, was quite hard.

Interestingly, Participant 9 noted both positive and negative impacts:

> Yes, I can say it impact my critical thinking. I learned a lot of how to change my opinion, change my view of point about one subject and just don't have one way to think about different topics and, but I believe if you rely over rely on ChatGPT it can have negative impact on your critical thinking skills.

Participant 10 noted:

> It enhanced my critical thinking . . . ChatGPT was able to give more examples about how to write critically.

Participant 12 mentioned:

> The use of AI has reduced the critical thinking skills. Previously, when we had to start something and do the work, we had to Google it, or we had to like to go through the entire paper and standards, read them, then find the results. But now AI is giving those results in a very quick way.

Theme 3: limitations and challenges of AI usage

Participants expressed mixed concerns about data privacy with AI tools. Six participants stated that they are concerned about data privacy, citing issues such as extensive data collection and lack of transparency. Three female participants expressed significant concerns about data privacy (P4, P5 and P9). In contrast, other female participants, P1 (Nigeria), P6 (China), P8 (India) and P10 (Algeria), were less concerned. Male participants also had varied responses, with some, like P2 (Syria), P3 (Turkey) and P7 (France), expressing strong concerns, while others, like P11 (Turkey) and P12 (India), were more accepting of the risks. Overall, while data privacy remains a concern, perspectives on its severity with AI tools varied.

Participant 3 noted:

> . . .Many AI tools collect intensive data on user behaviour and personal information, and this is raising concerns about how this data is stored, used and shared. . . There is often a lack of transparency about who can access the collected data and how it might be used by third parties, so this is I am concerned about it.

The second key finding is that initial concerns about sharing personal information are alleviated when considering the positive results. Participant 10 mentioned:

> Actually, I have not thought about this at all... I just share it and I get scared. But then when I think of the result and then I'm like, it's fine. It's going to be OK.

Furthermore, it was mentioned that AI is not considered a distinct data privacy concern because sharing data with apps have always been widespread; social media and other platforms are perceived as more critical for teaching about privacy. Participant 11 noted:

> I'm not really concerned about this in specifically in the context of AI because, before AI comes into our lives, we were also giving permission to all applications to have our data, so it's not really related to AI programs. I think for example it's more logical to concern about social media, not educate tools for data privacy.

Reliability and accuracy. All the participants stated that AI does not always provide accurate information, sometimes generating false data or fake references. They also mentioned issues with unclear information sources and emphasised the need to proofread AI-generated content due to its unreliability. Despite these challenges, AI tools still save time, though an extra step of verification is necessary.

The first finding was that AI tools often generate information without clear indications of its source or origin. Participant 2 illustrated this by saying:

> . . .I think their limitation is that they generate information and sometimes you don't know where this information is coming from.

Participant 8 also added:

> One of the biggest challenges is that AI is not reliable because it is just it is man-made. So, everything that that came from any other AI platforms had to be given like a proofread. Everything had to be checked second, which again it still saves time, but it was another extra step added on to it. . .

The second discovery about AI tools is their tendency to generate false information or provide non-existent citations that cannot be verified using reputable sources like Google Scholar. Participant 9 stated:

> The most significant challenges that I experienced with AI tools was making up some information from websites that they don't exist, even for example, it gives you some references, and then you search in Google Scholar or other databases for the reference, and you even cannot find references.

Participant 10 mentioned:

> Sometimes you ask ChatGPT to do something for you, but the result is completely different from what you're looking for.

In addition to the concerns about privacy and reliability, the integration of AI tools into assessments raises significant questions about academic integrity and their influence on the learning process.

Academic integrity: The integration of AI into international students' academic practices raises critical questions about academic integrity, particularly in the context of assessments. While AI tools like ChatGPT and Grammarly provide significant benefits, such as improving language proficiency and enhancing writing quality, their misuse poses ethical challenges that educators and institutions must address.

Several participants in this study highlighted the utility of AI in completing assignments. However, reliance on these tools may lead to unethical practices, including presenting AI-generated content as original work without critical engagement. Such practices undermine the learning objectives of assessments, which are designed to develop students' analytical, problem-solving and reflective skills (Farrelly and Baker, 2023). This aligns with findings from Chauke *et al*. (2024), which reveal that students using AI extensively for assessments often bypass the cognitive processes essential for deep learning. The dependency on AI tools for tasks like essay writing or problem-solving can limit students' ability to internalise subject matter, as emphasised by ONeill and Russell (2019). While AI-generated content may meet the formal requirements of an assignment, it does not guarantee that students engage critically with the material. This concern is particularly relevant for international students, who often face additional pressures to meet academic standards in unfamiliar educational environments.

Assessment is not merely a tool for evaluating performance but a critical component of the learning process (Boud, 2000). AI's influence on assessments necessitates a re-evaluation of how learning is shaped through these activities. On the one hand, tools like Grammarly and

ChatGPT provide opportunities for formative assessment, offering immediate feedback that can guide students in improving their work (Michel-Villarreal *et al*., 2023). On the other hand, over-reliance on these tools risks reducing assessments to procedural tasks, diminishing their potential as a platform for intellectual growth (Chan *et al*., 2023). AI also challenges traditional notions of academic integrity. Studies by Majewska-Pyrkosz (2023) indicate that while AI tools facilitate efficiency, they may lead students to prioritise output quality over the process of learning. This raises concerns about whether students are genuinely acquiring the skills assessments aim to develop, such as critical thinking, synthesis and independent research.

Theme 4: adjustment to a new academic environment

Eight participants (P1, P3, P4, P5, P6, P8 and P9) reported benefiting from AI for their language learning progress, utilising tools like Duolingo, Grammarly, ChatGPT and other AI translation apps to overcome language barriers, improve vocabulary and simplify complex information. Female participants from non-English-speaking countries, particularly in Africa and Asia, relied more on AI tools to overcome language barriers, except for Participant 10. Male participants generally reported fewer language challenges, with many focusing on refining their writing rather than addressing significant language barriers, such as P2, P7, P11 and P12. They did not use AI for language learning, with some only using it for grammar correction or not feeling the need for language assistance.

Participant 2 stated:

> . . .I'm good to speak in English, so I did not think about using AI for language. But in terms of barriers of language barriers, not for anything to do with me learning the language or like or anything that has to do with language barriers.

Participant 1 added:

> But other AI applications like Duolingo could be very instrumental in overcoming language barriers. But Grammarly also, regardless of how bad your English can be, Grammarly corrects it for you.

Participant 5 noted:

> So, it may be a little bit of personal learning, but I use Duolingo in the past and the application was helpful for learning new languages.

Participant 8 mentioned:

> Because English is not my first language and a lot of the words that come from initial research articles are quite big and some of the sentences are quite difficult to understand. ChatGPT really helped me simplify it to kind of bring it down to my level of understanding, which helped a lot.

Academic differences

Most participants found that the education system in the UK differed significantly from that of their home countries, with many noting that AI tools, such as ChatGPT, helped them adapt to these differences. Many female participants emphasised that AI tools were crucial in adapting to the UK academic environment (P1, P4, P5, P6, P8, P9 and P10). Most of the female participants who emphasised the importance of AI tools in adapting to the UK academic environment were from Africa and Asia.

Male participants showed a more varied experience. Participants 3 and 11 benefitted from AI. Participants 7 (France) and 12 (India) reported no significant difference in the use of AI tools between their home countries. Participant 2 from Syria mentioned that his adjustment to academic standards in the UK was largely supported by tutors rather than AI. He did not rely on AI to meet these standards. Participant 2 noted:

> I did not also use AI a lot for it. It wasn't AI that really helped me meet these standards. It was the tutors.

Participant 5 mentioned that the UK education system places a stronger emphasis on independent research and critical thinking compared to the education system in her home country:

> It was crucial in adapting to the more independent study style here compared to my home country. So here you must do a lot of digging on your own and you must do a lot of homework where you must do a lot of research. And compared to my country, which was more exam-based where you would get assessed.

Participant 8 described how ChatGPT helped cope with new academic assessments:

> . . .So, coming to England was quite hard, being able to do basic stuff like analysis or even critical thinking and ChatGPT has given me that kind of like a safe spot or like a barrier where it helps me.

In contrast, Participant 7 observed that AI did not aid in adjusting to different academic standards, as the participant had received education in France before coming to the UK for their master's programme:

> In my case, I'm from Europe, specifically a neighbouring country, so it's not that big of a gap, to be honest, and I did not really use AI for this.

One of the findings is that the participant initially relied on AI tools like ChatGPT for simple enquiries but later, in the UK, recognised the importance of crafting precise prompts to obtain accurate responses from ChatGPT. Participant 1 from Nigeria noted:

> I didn't even know Grammarly existed until I came to the UK.

Participant 9 also mentioned:

> . . . I was not aware about AI tools that much; I just used it for simple questions. But after coming to the UK, I get familiar with it and now I'm going to learn how to improve my prompts and how to ask the exact questions.

Additionally, Participant 11 mentioned:

> . . .Back in my home country, I was used to the system. But when I got here everything was new. So, I didn't know anything. To get used to the assignments, AI tools really helped me. ChatGPT really helped me because as I said, it's helped me to understand the tasks.

Theme 5: language proficiency and communication

According to the participants, AI-powered translation tools have been crucial for overcoming language barriers and enhancing their understanding of course materials. Female participants who used AI as a translation tool were P4, P5, P6 and P10. Female participants from Morocco and Algeria mostly mentioned this usage. Only two male participants, P3 and P7, mentioned using AI as a translation tool. ChatGPT was used to provide instant translations of course content and communications, facilitating engagement with academic material.

Another key use of AI tools was for translating written paragraphs between languages, such as from French to English, and ensuring that academic writing was accurately expressed in both the participants' native languages and English. Participant 4 illustrated this by saying:

> I, for instance, when I wanted to translate a paragraph that I have written in French to English, I used language tools that work with, I guess, like AI language tools to transform that sentence.

Participant 5 noted that AI tools played a significant role in clarifying academic jargon and improving language accuracy in assignments, greatly facilitating comprehension and communication in an academic context:

> AI-powered translation apps have been crucial in helping me to understand academic jargon because I come from a background where I've studied my master's in French, so sometimes it would require me to translate some words from French to English.. . .And AI helped a lot.

Another key finding from Participant 6 is the method used to ensure academic quality in both English and Chinese. The assignment is first drafted in English, then translated into Chinese and finally translated back into English using AI. This process helps compare the translated text with the original to ensure accuracy and consistency across languages:

> Actually, to make sure my language is fully academic in my assignment, I will first use English to write it. Then actually I will write two versions, a Chinese version and the English version, and after I finish my English version, I will translate my Chinese version into English to compare with the original English version which I wrote.

Finally, Participant 10 stated:

> For example, sometimes I must write some paragraphs for my assignments or anything, so I just write it in my language and then I ask ChatGPT to translate it properly.

We identified several non-content-related factors influencing participants' engagement with AI tools, as outlined in Table 2. These factors are like how engagement decisions are affected by elements such as product and service quality, social proof and personal recommendations.

Table 2. Additional themes

Non-content related themes	Participants' quotes
Tool preferences	This research highlights the widespread use of AI tools in academia, with participants favouring a diverse range. ChatGPT and Grammarly are particularly popular, while tools like Chat PDF, Gamma, Claude, Perplexity AI, Kimi Chat, and QuillBot are also noted. All 12 participants used AI for academic purposes, with 12 using ChatGPT and 7 using Grammarly
Accessibility of AI tools	"Especially in the winter vacation ChatGPT is not allowed to use in China. Nowadays they try to be this totally not allowed in China now, and I can't even log into ChatGPT with my VPN in China." (Participant 6)
Originality in the use of AI tools	"It gives you a generic view, that's where you need to be careful as well because other people might be using AI too. But you need to put your own work into it. You need to personalise it. Every representation might decide to use AI and every because submitting the same thing. So, what makes you stand out?" (Participant 1)
Alignment within the industry	"Maybe like for making a syllabus or curriculum and comparing it with the industry standards and our education standards there, we may be a can be used so that the gap between the industries and the education sector can be reduced." (Participant 12)
Improvement suggestions for international students	"I think these kind of AI tools could improve their language function like using different language like they could have an option. I'm a Chinese. When I am using ChatGPT, I could choose the Chinese version of ChatGPT to help me more, I think that's the function I wanted them to improve." (Participant 6)
Improvement suggestions for international students	"They should have culturally diverse futures and more like interactive elements. Like maybe they could have like a website. I mean, a kind of chat bot, or like a kind of interactive platform where people from different part of the world when interact and like using more." (Participant 1)

Source(s): Authors' own work

Discussion

The findings reveal that international students predominantly benefitted from AI tools like Grammarly and ChatGPT for improving their writing and grammar skills. This aligns with previous studies, such as Koltovskaia (2020), which demonstrate the ability of AI to enhance language accuracy and writing quality. Participants confirmed that these tools provided essential support in meeting academic writing standards in English, especially for those who face language barriers.

For example, one participant highlighted how Grammarly reduced the stress associated with writing in a second language, a concern supported by Brown (2008), who emphasised the importance of language proficiency for international students' academic success. Moreover, the literature suggests that AI tools not only provide grammatical correction but also help learners refine their academic voice, as demonstrated by Michel-Villarreal *et al*. (2023). This aligns with a participant's reflection that AI tools helped her "structure ideas clearly," thereby building confidence in her writing.

However, while AI tools offer clear advantages, there is concern that they may inhibit students' development of deep language skills, as raised by ONeill and Russell (2019). By automating much of the writing process, AI risks fostering a dependency that limits the ability to internalise grammatical rules, a point emphasised by some participants who questioned whether AI was "doing the work for them." This finding supports Chauke *et al*. (2024), who argue that while AI can assist in overcoming immediate linguistic challenges, it must be used judiciously to avoid undermining language acquisition in the long term.

AI's role in enhancing time management is another prominent finding. Participants emphasised how AI tools helped them organise their workload, summarise complex readings and stay on track with their assignments. The use of AI for summarising articles was seen as a critical time-saver, allowing students to focus on the most relevant material, a finding that resonates with Berşe *et al*. (2024), who observed that AI's ability to streamline academic tasks is invaluable in high-pressure environments like higher education. However, the reliance on AI for time management raises concerns about over-reliance. While AI tools offer immediate efficiency, students might not develop independent time management strategies. This is echoed by Farrelly and Baker (2023), who argue that AI can foster a passive approach to learning, where students depend too heavily on automated tools. Thus, the findings suggest that AI should be integrated into students' learning in a way that encourages independent time management while using AI as a supportive tool.

AI's influence on critical thinking emerged as a double-edged sword in the findings. On one hand, many participants reported that AI tools like ChatGPT enhanced their ability to consider diverse perspectives and engage with complex topics. One participant noted that AI helped her "see things from different angles," supporting critical engagement with course material. This aligns with Michel-Villarreal *et al*. (2023), who demonstrated that AI can foster critical thinking through guided inquiry and personalised feedback. However, the potential for AI to diminish critical thinking skills also emerged, particularly among participants who feared that AI might provide "quick answers" that discourage deeper cognitive engagement, a concern echoed by Chan *et al*. (2023). While AI offers efficiency and guidance, it may reduce opportunities for independent problem-solving. One participant's comment that AI "makes things too easy sometimes" encapsulates this tension, highlighting the need for educators to balance the benefits of AI with the need to foster deeper cognitive engagement. Thus, this study contributes to ongoing debates about AI's role in promoting or inhibiting critical thinking. While AI can serve as a cognitive aid, overuse may undermine the development of independent, critical faculties. Educators need to ensure that AI complements, rather than replaces, critical thinking exercises.

Data privacy emerged as a significant concern among participants, aligning with previous research by Holzinger (2018) and Fok *et al*. (2018). Participants voiced apprehension about "how data are collected and used," reflecting widespread anxieties about AI technologies in educational contexts. This finding is consistent with studies that highlight the ethical

implications of AI, particularly concerning data storage and use (Farrelly and Baker, 2023). Some participants, however, were less concerned about privacy risks. This divergence in attitudes suggests that universities must develop robust policies addressing these concerns, as noted by Barakina *et al*. (2021). Universities should provide clear guidelines on AI use and data protection to build trust among international students, ensuring transparency in how AI technologies handle their information.

The data revealed that while AI tools such as ChatGPT and Grammarly are widely appreciated for enhancing efficiency and providing personalised learning support, their role in shaping academic integrity is more complex. Several participants acknowledged using these tools extensively for assignments, raising concerns about ethical boundaries. One postgraduate student commented, "I rely on ChatGPT to draft the structure of my essays, but sometimes I wonder if this means I am not really learning." This sentiment reflects broader concerns about the role of AI in assessments as learning experiences, where the focus shifts from the process of knowledge acquisition to achieving outputs efficiently. The participants' accounts highlight a tension between leveraging AI for efficiency and maintaining academic integrity. Some students reported using AI for grammar correction or idea generation as an aid to learning, while others admitted to relying on it for content creation without critical engagement. This over-reliance not only raises ethical concerns but also limits the development of independent research skills and critical thinking – key outcomes of postgraduate education (Farrelly and Baker, 2023). In relation to assessments, the data suggest that students perceive AI tools as both a support mechanism and a shortcut. While AI offers immediate feedback and tailored suggestions, it also risks undermining the developmental purpose of assessments, which should encourage deep learning and intellectual engagement. This aligns with existing literature that cautions against the misuse of AI in academic settings, particularly in formative and summative assessments (Boud, 2000; Chan *et al*., 2023).

All participants expressed scepticism regarding the reliability and accuracy of AI-generated content. Several reported that AI tools often produced inaccurate or fabricated references, with one participant noting that "AI sometimes gives false information." This concern is supported by Farrelly and Baker (2023), who caution that AI tools, while helpful, may introduce errors that can mislead users. Participants highlighted the need for human oversight to verify AI-generated outputs, supporting Holzinger's (2018) assertion that AI should supplement, not replace, human judgement. Students must be trained to question and verify the information provided by AI to ensure it aligns with academic standards, fostering critical thinking and responsible use of these technologies.

AI tools played a pivotal role in helping international students overcome language barriers. Many participants noted that AI-powered translation tools and grammar checkers were instrumental in improving their language proficiency, a finding supported by Levin (1989) and Singh *et al*. (2022). This aligns with research by Almira (2023) and Constantin (2023), which highlighted AI's role in accelerating language learning through real-time feedback and corrections. However, reliance on AI for translation raised concerns about hindering full language immersion. One participant remarked that depending on AI for translation might prevent students from engaging deeply with the language learning process, a concern echoed by Feng and Wang (2023). While AI tools provide essential support for linguistic challenges, educators should encourage a balanced approach that integrates AI with traditional language learning methods to ensure deeper, sustained engagement with the target language.

A significant finding was AI's role in helping international students adapt to new academic standards. Participants reported that AI assisted them in transitioning to a more research-based, critical thinking-oriented educational environment. This finding supports Gautam *et al*. (2016), who highlighted the difficulties international students face when adjusting to new academic systems. AI provided guidance on research methodologies, citation standards, and academic writing, facilitating students' adaptation to more independent learning environments. However, the findings suggest that AI's role in this transition must be

complemented by human mentorship to ensure students fully grasp the nuances of academic expectations in their new environment.

Policy implications for universities

The findings indicate that AI tools like Grammarly and ChatGPT are pivotal in supporting international students' academic success, particularly in overcoming language barriers and adapting to new educational standards. These tools offer students the ability to improve their writing skills, manage time effectively and enhance their engagement with course materials. However, the findings also reveal that many students were unfamiliar with AI tools before arriving in the UK. This presents an opportunity for universities to offer structured training programmes, integrating AI tools into student orientation or academic support services. For example, institutions can design workshops that guide students on using AI tools ethically and effectively. These sessions should cover both the technical aspects of AI use and address ethical considerations, such as data privacy and academic integrity. This is particularly important, as concerns about data privacy were raised by several participants. Universities can mitigate these concerns by establishing clear data protection policies and informing students about how their data are collected and used. This echoes the recommendations by Barakina *et al*. (2021), who stress the importance of ethical frameworks for AI integration in higher education. Furthermore, universities should consider the potential of AI tools to streamline administrative processes, such as academic advising, feedback on assignments or even assisting with course selection based on students' academic strengths. For instance, AI tools could help students identify gaps in their academic performance, offering tailored suggestions for improvement. However, universities must ensure that AI is used to complement, rather than replace, human support, particularly in areas requiring nuanced understanding, such as mental health services or complex academic advising.

In designing such programmes, it is essential to consider not only the technical skills required to use AI but also the ethical dimensions, ensuring students understand how to use AI tools responsibly in assessments. For instance, universities should implement workshops and training programmes that educate students on the ethical use of AI tools in assessments, similar to the ethical training provided when conducting research and teaching student about data collection matters. Such programmes can emphasise the distinction between using AI for support (e.g. grammar correction or brainstorming) and unethical practices like submitting AI-generated content as their own (Barakina *et al*., 2021). Also, educators should design assessments that account for the availability of AI tools. For example, oral defences, reflective journals and process-based evaluations can encourage students to demonstrate their understanding beyond what AI can provide (Hänel and Söllner, 2023). Given concerns about data privacy, institutions must ensure that AI platforms used in assessments comply with robust ethical standards. Students should be informed about how their data are collected, stored and used to build trust and encourage responsible engagement with these tools (Farrelly and Baker, 2023). Lastly, assignments requiring students to critically evaluate AI-generated outputs can help develop their analytical skills. For instance, students could compare AI-generated content with traditional academic sources, assessing reliability, depth and alignment with academic standards (Chauke *et al*., 2024).

Implications for educators

For educators, the integration of AI into the learning environment offers both opportunities and challenges. On one hand, AI tools can relieve educators of administrative tasks, allowing more time for personalised instruction and engagement with students. On the other hand, the findings highlight concerns about AI's potential to diminish critical thinking, particularly if students become overly reliant on these tools for quick answers. Educators can address this challenge by designing curricula that leverage AI tools to foster, rather than inhibit, critical thinking. For example, instead of simply allowing students to use AI tools to complete

assignments, educators could incorporate activities that require students to critically evaluate the outputs generated by these tools. For instance, students could compare AI-generated content with traditional research methods, assessing the accuracy, reliability and depth of information. This approach would help students develop critical thinking skills while using AI as a supportive resource. Additionally, educators should incorporate discussions on the ethical use of AI into their courses, highlighting issues such as data privacy, intellectual property and the potential biases in AI algorithms. By doing so, students will not only gain technical proficiency but also develop a deeper understanding of the broader societal implications of AI. This aligns with Hänel and Söllner's (2023) argument that AI literacy should extend beyond mere technical skills to include a critical understanding of AI's impact on society.

Implications for students

The findings suggest that while AI tools have clear benefits for international students, such as improving language proficiency and time management, there are also significant risks associated with over-reliance. For instance, students who rely heavily on AI for grammar correction may struggle to internalise the rules of academic writing, as suggested by ONeill and Russell (2019). Similarly, using AI tools to summarise complex articles could hinder students' ability to engage deeply with academic content. To address these risks, students should be encouraged to use AI tools as supplementary aids rather than replacements for traditional learning methods. For example, instead of relying solely on AI for writing assignments, students could be asked to draft their work independently and then use AI tools to refine their writing. This approach would help students develop their writing and critical thinking skills while benefiting from the efficiency of AI tools. Moreover, the findings highlight a growing concern regarding data privacy among students. Institutions should ensure that students are educated on the potential risks of sharing personal information with AI platforms, especially those that are not institutionally sanctioned. Providing guidelines on the ethical use of AI tools can empower students to make informed decisions about their digital footprint. In sum, students need to develop a balanced approach to AI usage. This requires a critical mindset where AI is viewed as an enhancement to learning rather than a shortcut. By fostering such an approach, universities can help students maximise the benefits of AI while mitigating the risks of dependency and intellectual disengagement.

Conclusion

The integration of AI in higher education, particularly for international students, offers significant benefits in enhancing academic performance and supporting the adjustment to new academic environments. However, the findings of this study emphasise the need for a balanced approach that ensures AI tools are used ethically and effectively. Universities should focus on providing comprehensive training and clear policies to support students in using AI responsibly, while educators should design curricula that integrate AI in ways that promote critical thinking. For students, the challenge lies in using AI as a supportive tool while developing the independent learning skills necessary for long-term academic success. By addressing these implications, institutions can create a more supportive and equitable learning environment, ensuring that AI serves as a tool for academic enhancement rather than a replacement for essential cognitive skills. This is a call for future research to prioritise understanding the nuanced relationship between AI usage, academic integrity and assessment design to ensure AI is a supportive tool for learning, not a shortcut that undermines educational objectives.

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Supplementary material

Question 1: Can you briefly introduce yourself and where you are from, tell me which module you are studying, and what level of education you are receiving?

Question 2: Which AI tools did you use during the semester?

Question 3: How have you mostly used AI tools?

Question 4: What features of AI tools do you find most beneficial in your studies? Why?

Question 5: How have AI tools impacted your learning experience, particularly regarding engagement with course materials and understanding?

Question 6: Can you describe any instances where AI technology provided personalized learning experiences that significantly benefited your academic performance?

Question 7: In what ways have AI-driven language learning applications helped you overcome language barriers and adapt to the new educational environment?

Question 8: What are some of the challenges or limitations you have faced while using AI technologies in your educational journey?

Question 9: How concerned are you about data privacy and security when using AI-based educational tools? Have you faced any specific issues?

Question 10: Do you believe that the use of AI tools has influenced your critical thinking skills? If so, how?

Question 11: How has AI helped you adjust to the different academic standards and classroom dynamics in your new educational institution compared to your home country?

Question 12: What improvements or features would you like to see in AI technologies to better support international students in their academic and personal growth?

Figure A1. Interview schedule

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