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Learning in the age of AI: The case of international graduate students in U.S. higher education

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ABSTRACT: *International graduate students face unique linguistic, cultural, and academic challenges in U.S. higher education, and the increasing influence of artificial intelligence (AI) adds new opportunities and adjustments to their learning practices. In this study, we examine how international graduate students interact with AI to navigate learning in their new environment. The findings show that students use AI in various ways as they navigate their new learning environment. These include using AI to summarize readings, proofreading writings, helping with their writing, adjusting to the new learning environment, and collaborating with AI as a friend and learning companion. Although participants recognize that AI can be misleading, they still encourage its critical use. These findings reveal that students engage in AI-mediated learning.*

Keywords: artificial intelligence (AI), international graduate students, learning, AI collaboration, new learning environment; adjustment; AI-mediated learning

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INTRODUCTION

The influence of artificial intelligence (AI) on today's academic discussions and settings can no longer be questioned. AI is at the center of conversations, workshops, webinars, and research at various institutions of higher learning in the United States. While some institutions have established AI centers, most emphasize professional development sessions through workshops, webinars, and even casual discussions among scholars with different approaches to AI use, adoption, and impact on teaching and learning. Although most institutions have yet to develop a centralized policy or strategies on how stakeholders such as students, faculty, and administrators should use AI to help with their daily activities, AI use is still democratized; that is, it is dependent on individuals' needs, contexts, and realities.

According to the Institute of International Education's (IIE) "Open Doors Report on International Education Exchange" (2025), the number of new international students in U.S. higher education declined by 17%. However, according to the Open Doors Report (2025), there was an increase of five percent during the 2024/2025 academic year from the previous year, from more than 200 places of origin. These students come from different cultural backgrounds and educational systems, which implies various styles of teaching and learning (Click, 2018); diverse cultural and emotional needs (Elturki et al., 2019), including a limited sense of belonging and adjustment to new ways of thinking and doing (Chen, 2018; Wu et al., 2015); and navigating cultural transition (Rajaratnam & Giraldo-García, 2026) and different expectations and conceptions of success (Elturki et al., 2019). For instance, research shows that international students experience cultural shock because of the differences in cultural values and views in their new learning environment (Elturki et al., 2019). International students encounter both academic and cultural obstacles (Jha et al., 2024; Perry, 2016). These include limited collaboration opportunities with domestic students, difficulty understanding lectures, and more time spent and effort reading academic literature and completing writing assignments (Lin & Scherz, 2014). These students also struggle in their communication with faculty and their domestic peers given their language barrier and "lack of proper understanding of effective interactions in the foreign culture" (Elturki et al., 2019, p. 194). Although most of these students are comfortable using technology, they still struggle with academic writing and timely assignment completion (Perry, 2015).

Wu et al. (2015) report that international students experienced discrimination both in academic and social settings and that their "American peers might not understand their backgrounds and [make] conclusions for them" (p.6). Interestingly, these studies also demonstrate that these students, while struggling

with their English expression and social integration, leverage peers' support, university resources, faculty, and staff to help with their adjustment process and to cope with the feeling of isolation because they live away from their families (Ajjan, 2026; Jha et al., 2024).

Studies have investigated the strategies international students use to overcome the academic and cultural challenges they face. The literature shows that socializing with native English speakers to foster their English (Abboud et al., 2026; Wu et al., 2015), engaging with the local community through churches, and engaging in sport help with their cultural adjustment (Elturki et al., 2019; Sharma, 2026). Campus resources such as writing centers and seeking language support are other strategies international students employ to address their challenges (Rodríguez et al., 2019). As Click (2018) signals, international students in the United States “face unique challenges in adapting to and succeeding in American higher education, particularly in relation to conducting academic research” (p. 155). In the algorithmic age, AI is increasingly shown to be a crucial asset for graduate students engaging in academic research (Xiang et al., 2024). Therefore, exploring how and why international students collaborate with AI during their academic journeys is relevant. Limited research has explored the potential of AI to shape the learning experiences of international students, particularly international graduate students in the United States. In the present research, we investigated how international graduate students use and collaborate with AI to navigate their new academic and cultural settings. In other words, we were interested in how AI shaped these learners' experiences in the American academic and cultural environment.

REVIEW OF RELATED LITERATURE

Studies reveal that AI presents exciting possibilities for graduate-level research (Xiang et al., 2024). AI can cultivate the essential academic and research skills of graduate students (Torres & Green, 2024; Choudhuri et al., 2023). For instance, generative AI tools such as ChatGPT can provide academic writing support to students at different phases of the academic writing process: a) generating research questions and ideas; b) correcting and proofreading; and c) correcting grammar (Rowland, 2023). AI also allows students to detect and correct language errors (Fitria, 2021) and improves their manuscript's overall intelligibility and logic (Lui et al., 2023). Given the potential of AI for graduate learning, in the next section, we discuss AI in relation to international students.

International students and AI

As previously stated, international students face many unique challenges when they are pursuing higher education in a different country. With the promise of AI, these challenging experiences have led institutions of higher education to examine how AI applications can help mitigate these challenges (Wang et al., 2023). For instance, AI writing tools, voice recognition, and AI translation tools have been shown to aid in the learning of international

students whose first language is not English (Wang et al., 2023). In their study, Du and Daniel (2024) reveal that AI has changed the learning experience of international students by addressing issues such as language barriers, academic integration, and cultural adaptation, with AI applications that help students' academic writing (Abdelrady et al., 2025). AI tools further help students translate academic materials, making them more comprehensible and accessible (Islamov, 2021). Khan et al. (2021) also demonstrated how AI-powered tools can assist students with immediate and personalized feedback on writing assignments. These applications become a space for these students to improve their language skills and adjust to their academic learning environment expectations (Mehrad et al., 2025). Similarly, Arslan et al. (2025) reported that AI tools help students summarize articles, manage their academic workload, adapt to their new learning environment, and develop their critical thinking skills. However, research shows that AI threatens critical thinking because critical thinking is increasingly being outsourced to AI (Aboodi, 2025; Morris, 2024). Indeed, emerging research reveals that future generations of learners are likely to rely on AI in any situation that requires critical thinking (Aboodi, 2025). Hence, the findings of Arslan et al. (2025) concerning AI improving students' critical thinking skills contrast with the growing literature on the negative effect of AI on the ability to critically think (Çela et al., 2026). Like their peers in the studies above, Nazir (2026) reported that international students in Turkey equally use AI to generate ideas; to complete research tasks; and to learn and translate language. Furthermore, students rely on AI-powered tools such as ChatGPT to manage loneliness and to manage academic stress and anxiety in a foreign environment (Nazir, 2026). Similar findings were reported by Dhiman and Kashyap (2025), with AI applications helping to foster a sense of belonging and community, social integration and overall student well-being. Although ChatGPT was also used by students to learn new cultural norms and etiquette and to receive advice on suitable social behaviors (Ma et al., 2025), Nazir (2026) stated that AI cannot replace "core human capacities such as creativity, empathy, and ethical judgment" (p. 12). Although Nazir (2026) warns that AI cannot replace human ability, most of the studies discussed above on AI and international students do not address the threat of AI reliance. While AI tools are useful for student learning and living, concerns about the ethical use of AI by international students are not covered in this research. Neither is the importance of connecting with humans and not machines/AI discussed as critical in the process of adapting to a new learning environment for international students.

Outsourcing cognitive activities such as idea generation, writing, and article summary threaten students' ability to think. Writing prompts and having AI generate ideas or summarize articles makes learners think that they are thought in words themselves, as they take word patterns generated by AI as answers to the questions they asked (Morris, 2024). Thus,

[students] are letting GenAI insert itself into what most of all makes us human, which is meaningful communication with one another. As Aristotle might have said, AI systems may generate and communicate information, but only human information systems communicate about the good (Morris, 2024, p. 3049).

Research has indicated that negative impacts of AI, such as overreliance on AI, may promote laziness and prevent meaningful engagement with learning tasks (Nazir, 2026). AI is a menace to creative writing, originality, authenticity, and academic writing (Akyıldız, 2025; Octaberlina et al., 2024). Moreover, issues related to data privacy, such as the ability of AI platforms to gather personal information to use or store, reliability and accuracy, as AI does not always deliver precise information and sometimes produces misleading information and false references, are not widely discussed in the literature on AI and international students (Arslan et al., 2025). The extensive use of AI by international students for assignments such as essay writing and/or problem solving can lead to unethical practices, especially when students present AI-generated content as their own (Farrelly & Baker, 2023) or when students use AI to complete assignments, thus limiting their engagement with learning materials (Arslan et al., 2025). However, current studies focus mostly on international students outside of the United States and not on international African graduate students in the United States. This study expands the research on AI and international students by centering on international African graduate students at predominantly white institutions (PWI) in the United States from a sociocultural learning perspective.

Theoretical framework

We adopted sociocultural learning theory as a framework to make sense of the data. Sociocultural learning theory contends that a) learning occurs formally or informally through participation in a social context; b) social contexts influence and are influenced by linguistic and material tools such as language, practices or technology; and c) cultural rules and tools limit behavior while making space for individuals to oppose these rules (Kahlke et al., 2019). Learning from a sociocultural perspective is therefore mediated by interactions with the social context, participation in community practices, language, or technology available in the sociocultural context (Lave & Wenger, 1991). According to sociocultural learning theory, individuals are not isolated entities; they function in and learn through their interactions with their environments (Polly et al., 2017). In the context of this study, AI functions as the technology that mediates participants' learning while shaping students' new learning environments and being shaped by it as the technology available in students' learning context.

METHODS

To investigate international African graduate students in the U.S. who use and collaborate with AI, we adopted a qualitative approach. Given our interest in international African graduate students at PWI, we used purposive sampling. Purposive sampling was more appropriate because we sought to identify participants with experiences relevant to our study (Ahmad & Wilkins, 2025). Indeed, purposive sampling is the process of selecting context, materials, or participants with specific characteristics that provide rich information about the understanding of a phenomenon (Creswell & Poth, 2017; Morse, 2020). With respect to international students, PWI is unique because unlike minority-serving institutions, white students constitute the majority, and minoritized students tend to experience racism and face incidents related to nativism (Bourke, 2016; Yao et al., 2021). Hence, the challenges faced by international African graduate students at these institutions are likely to be shaped by racism, thus exacerbating the difficulties previously mentioned. We were interested in understanding international African graduate students' experiences in their new environments as they navigated their new cultural, linguistic, and academic contexts in the AI era. Given the focus of the study, international African graduate students at PWIs, we recruited five participants during the Fall academic semester from different PWIs in the West and South of the United States. We conducted semistructured interviews of approximately 60 minutes per participant via Zoom. The interviews were recorded and then automatically transcribed using the Zoom audio-transcription feature. Each transcript was then manually reviewed and corrected by the authors when a word was omitted or misspelled.

The researchers coded the data separately and then compared their codes to achieve intercoder reliability. The coding process was guided by the main research questions: a) How do international African graduate students collaborate with AI in their academic journeys, and why do these students use AI in their learning journeys? Thus, the researchers coded sentences, phrases, or words that address our main research questions. The data analysis followed an iterative process, as the transcripts were read closely to create codes (Church et al., 2018). We adopted a thematic approach to data analysis, as we first familiarized ourselves with the data, making notes on potential codes; b) generated initial codes; c) searched for themes; d) reviewed the themes; and finally, e) defined and named the themes (Riger & Sigurvinsdottir, 2016). The suggested codes and themes were discussed during a group meeting, where the researchers agreed upon adjustment and meaning to the codes and themes (Church et al., 2018). Our discussions revolved around the similarities, differences, relations and patterns within and between codes (Hitch, 2024). Our discussions showed high levels of agreement between the researchers, and we were able to reach unanimity about the data (Sweeney et al., 2013). The names used in this paper are pseudonyms. Our findings are discussed in the following section.

FINDINGS

Our analysis of the data revealed four major themes that capture how the international African graduate students in this study use and collaborate with AI applications to navigate their new learning environment. We should indicate that participants were from disciplines such as educational technology, learning sciences, statistics, communications, and history.

Making sense of academic content

For participants, AI was critical for making sense of or understanding academic content or material. For instance, as nonnative English speakers, it was important to fit into the academic context and meet the high learning demands required in their fields. This meant understanding complex terms and topics discussed in articles assigned to the class by instructors. By making sense of academic content, we mean simplifying, interpreting, and making it understandable and coherent. In this context, their learning was mediated by AI, which, from a sociocultural learning theory perspective, was also the technology that shaped their learning environment and influenced their learning. For instance, Irma, talking about assistance AI tools such as ChatGPT, gives her an understanding of academic articles:

However, for me, I tend to use AI just for learning, like, hey, for some reason, maybe something, to clarify...during summer, because I have a lot of readings, and sometimes I need to read an article 3–4 times, because I'm reading it in a different language, I deal with the language level, I deal with the complexity of topic, I deal with so many... then understanding it, then applying it.

This statement, from a sociocultural learning perspective, illustrates how AI acts as a cultural tool to mediate learning and transform how these students interact with the learning content (Ünlüsoy et al., 2022). The literature shows that English for international students in the United States is a pedagogical challenge; these students often translate words into their own language to understand academic content to navigate their learning (Gautam et al., 2016). This process affects their adjustment in this new learning environment (Ammigan et al., 2022). As shown in the excerpt above, the barrier created by Irma's limited English is overcome by AI, which gives her key ideas of articles she must read before she reads them, thus somewhat scaffolding her understanding of the topic and helping her to focus on what is relevant. AI becomes a learning partner and, to some extent, a facilitator that helps in understanding or making sense of academic readings and/or concepts. To understand the academic content, other participants, such as Alyma, when given an article as the guide/basis for class discussion and questions, will ask the given question to AI tools such as ChatGPT and read the response before reading the assigned article:

I have been given an article. Somewhere, somehow, I have an idea about this situation. Yes. Therefore, are we... I have an idea already,

so I will just copy the... that question on ChatGPT, and then just read through, then go back to the article that I have to read to get the answers. Therefore, I put it on ChatGPT, I'll read the answers, I will add it to what I think already, then I will go back to the article. I feel that is, that is a personal thing to me. (Alyma)

Thus, AI is used to facilitate and fasten Alyma's understanding of the assignment. She can make sense of the content of the question and find the appropriate answer to the assigned question from AI first and not the article reading. AI replaces the article as the first source of knowledge for Alyma to address the question asked by the instructor in class. According to sociocultural learning theory, Alyma's learning occurs through interactions with AI, the cultural technology in this learning context. The article assigned by the instructor acts as a supporting document but not as the main source for understanding how to address the reading question. Indeed, Alyma uses AI to better comprehend or obtain a sense of the appropriate answer should be in relation to the literature. AI appears to simplify what may seem complex content to international students when they complete class activities. As Irma further adds about AI, "it is used just as a way for us to reach the knowledge." In other words, AI facilitates or makes easy access to knowledge.

Saving Time

Given the multiple demands of graduate learning in the U.S., participants worked with AI to save them from spending more time on a particular task. For instance, Dara says,

Well, I find ChatGPT truly useful to me because it helps me to save a lot of time. Because there's quite a lot of readings to do, and sometimes I'm not able to finish all of them in the span of one week, because probably you're taking four courses, and all of them are giving you multiple articles to finish within the week, and I am personally somebody who wants to read the article and get the deep information.

In a similar vein, Rene says, "It saves time, saves energy, and so many times, I use it to learn something new." AI is scaffolding participants' learning, taking from their zone of proximal development (ZPD) to the step where they can be independent (Lave & Wenger, 1991). In short, for participants, what they would naturally spend hours reading or trying to comprehend because they are either not native English speakers or from a different academic culture takes less time to complete now because of AI. Rene sums it well, when she states that "if you ask me to see three different, like, benefits, I will say it is saving, it's saving time and saving energy to guide you, like, to narrow that perspective that you want, like, it is not like you're lost." We can argue that for participants, AI applications make easy or help with their graduate learning, as seen in this statement from Alyma "It saves me time. It makes your work easier. It gives you understanding."

However, as a cultural tool, AI also shapes participants' thinking and learning, which may raise concerns about the outsourcing of participants' thinking (Akyıldız, 2025; Octaberlina et al., 2024), as discussed above.

Proofreading and summarizing

The challenges international students encounter in the United States are not only about speaking English; writing academically is of great concern, especially in graduate school, which demands many writings even with assignments/assessments that are, for the most part, not multiple-choice questions, nor require a yes or no answer. For this reason, Bern says,

Yeah, like ... English is not our first language, so if you write something for your advisor, you want it to sound perfect, so you just ask ChatGPT to maybe correct the language for you, especially with Grammarly. Therefore, I just copy what I wrote, everything that I have written down, then I just paste it either in Grammarly, then I just ask it to correct the language, yeah, to make it maybe academic and stuff, and they would suggest the point, or where to put, maybe, the correct words there.

The usefulness of AI to proofread and correct participants' academic writing is also echoed by Phanos, who explained that "I use it for proofreading of my write-ups... it could actually do way better than humans." AI is therefore able to give students immediate feedback on their writing and help correct it to make it sound and look more academic, as noted by Irma,

Use it to correct your English, to correct your grammar, to help you develop your writing, or upgrade your writing, but never rely on it as someone who would do the job for you. Yeah, I use it, like, as a peer review, you know?

Irma adds more practical use of AI in proofreading even the emails she writes: "email, of course! No, emails, it is a must... I copy, and I paste them in Word, and make sure they look sound ok, for me, as a third eye, it is a must." For participants, proofreading their all their writings, even emails, serves to earn respect and to positively shape the perception that their peers may have of them as Alyma states:

I have quite some level of language, but it is not to the level that maybe a native would have. Additionally, I care about the impression of that person on me. Like, if maybe they find four or five mistakes in the email, they will say, oh, that email is not even worth replying to. Therefore, it is also about, like, you do not want them to look down on you to have a wrong perception. It is about how they will perceive you, how they, like, how they would see me later. Yeah. The impression that they get from just reading my email.

Summarization is another way participants interact with AI applications in their graduate learning. The following statement from Alyma demonstrates how AI helps students navigate learning in their new environment:

I ask AI, can you please summarize this article, or tell me what are the main takeaways for this article? I read those, then I go back to read the article. Therefore, I do not read the article, then ask. No, I ask first, because that would give me an idea about the things that I need to focus on. Therefore, it will, like, somehow guide my reading, which is sound... I mean, I have been doing it recently, seems okay; so, I summarize first, go back to the article, then read it.

However, participants also acknowledged that summarizing articles should not prevent students from making time to read the articles themselves. As Phanos explains, the summary does not always provide all the needed information:

I do not have to force myself to just brush through. I can do so for class conversations, but I need to make time to read the article, to get the readings done. Or else, I will end up thinking, I have done the reading by just making ChatGPT give me a summary. However, that truly may not capture what I am looking for.... Therefore, I think it is just a balance of the time, making sure that you are balancing how you use ChatGPT and how you do your readings as well.

Secret friends

Learning, from a sociocultural learning perspective, occurs through interactions with technology and practices in a sociocultural context (Kahlke et al., 2019). Technology in the new learning environment constrains participants' behavior given that they find themselves in technology-rich environments where reliance on technology for everyday tasks is a reality (Kahlke et al., 2019). It is therefore not surprising that when AI becomes a secret friend, a friend AI cannot become in the country from which it originates because of limited technology. Thus, in their collaboration with AI applications, participants tend to humanize or give human-like attributes to AI, establishing human-like interactions with what they considered a secret friend, and even confidence. Irma points to the fact that "I feel like ChatGPT is like a human being, so it is what you feed it, it is what's it gives you...know how to put your questions. Like, give it a specific instruction, and then it will give you the answers." Irma follows up in her description of ChatGPT and states:

I feel like it is like a friend that you seek for advice to, and then you go and sit down and then think about it yourself, and then do what

you feel like is good. However, in another way, you take some of its advice.

Discussing helpful factors for international students' adjustment on campuses in the United States, Huang, Wang and Kong (2024) mention university friendliness, which refers to a university with social support and encourages inclusivity, better communication, and openness to diversity. International students feel more welcome in friendly campuses, and it is therefore not surprising that Bern finds a friend in AI, particularly in ChatGPT, when he says, "I mean, I do not want people to see me like, I have... I'm not a serious student; so, I kind of find a way to go around that. yeah, I go to ChatGPT like, kind of being, like, a secret friend." Irma goes a step further in her friendship with AI applications, giving names to AI depending on her mood. She explicates

it is funny, I'm that kind of person who gives names to people's things. Okay. Yeah. Therefore, it depends on my mood. Sometimes I can call it Mason; or sometimes I just call... I just call it J, Amazing or Jenny. Maybe, Mason, if I want to ask, like... About, oh, this did happen to me, and what do you think about it? Like, oh, this thing happened between me and a friend, like, those kinds of questions. In addition, Jenny, if it is about relationship talk.

As shown above, participants see in AI applications a friend they can ask questions to, without fear of being judged, look down upon or despise as they feel they could have if they went to their peers to ask the same questions. Turning an AI into a friend and sharing personal information with this tool point to the level of trust these learners put in this technology and likely signal the level of loneliness these students experience in this new learning setting. In effect, research shows that people's tendency to create relationships with AI is linked to elements such as their self-perceptions, perceptions of AI, and emotions about AI (Gur & Maaravi, 2025). For instance, situational loneliness is related to the development of relationships with AI (Wienrich et al., 2023; Xie, Pentina, & Hancock, 2023). Furthermore, research has shown that people who lack human companionship are more susceptible to cultivating AI relationships in lieu of human-human relationships (Laestadius et al., 2022; Xie et al. 2023). Hence, calling an AI a secret friend reveals the emotional connection that participants developed with the AI and is likely an indication that participants lack companionship. Friendliness is an emotional connection often reserved for human-human relations (Xie et al., 2023). In addition, the participants' self-perceptions, the need to be seen as serious students, as revealed in this statement from Bern, "I mean, I do not want people to see me like, I have... I'm not a serious student", explicate students building this strong and emotional relationship with AI. According to Irma, developing friendships with AI is particularly important for any international student. She argues that:

Yeah, I usually say that as an international student, you would need it because you cannot always go to somebody to ask for help because everybody is busy with their school life and personal life. Therefore, inasmuch as you can go to somebody to ask for help, it can also be your friend; it can help you with some things that you cannot actually ask someone; when that person does not have time to help you with your assignment, it is there, but to me, I always tell people who you truly have to be smart about it.

Hence, making AI your friend is critical for international students because of the assistance they may need to complete their assignments. Irma points to the sociocultural reality of the United States, a culture where everybody is busy and where despite their willingness, they may not be able to assist with your learning in a timely manner when you need, but with things participants cannot ask a peer. Therefore, AI is the technology that participants employ to adjust to the new cultural and learning environment. AI is becoming a cultural technology that helps students navigate their learning (Vygotsky, 1978; Lave & Wenger, 1991).

Adjusting to the new learning environment

Our analysis of the data also demonstrates that AI is useful for international students' adjustment to their new cultural and academic situations. Our participants started using AI upon their arrival in the United States. For instance, prior to joining their institutions, they had heard of AI but were not users of this technology because of skepticism about the technology. Phanos explained that when joining his program, he could not use AI because of his experience in his home country. Phanos, "When I got here, like my first semester, all through summer, I was always running away from AI... I could not use AI. I was coming with this mindset that I do not want to use it." Irma describes a similar experience: "I am someone who did not hear or did not use AI for its beginning, because I'm from Morocco, I did not grow up even, like, with digital and with everything. Like technology, I'm not someone who is into technology that much." However, being at their different institutions and faced with the need to adjust to the demands of the learning settings, participants adopted AI to adapt. Talking about her reason for adopting AI, Irma says,

I heard so many things, especially last year, particularly that wave of using AI. Therefore, that was like my beginning with AI was just last year. Yeah, because the reason that everybody uses AI is to help them do the learning they are doing. Yeah, if that would be helpful for me as well, why not? Therefore, the first thing I started with was, correcting my English.

Adjusting to the way others learn, or rather "do the learning", at their institution explains the embracing of AI in her graduate learning journey.

Phanos explains in the following excerpt how AI turns into a technology that assists with his adjustment to the new learning setting:

For so long before I started using it, a lot of people were, you know, finishing assignment, and I would be there, struggling with the 11.59 deadline. Therefore, but what did I now do differently? In my classes, you see some people do some things, you'd be like, hmm. So I had to, like, be doing things kind of manually, like, the whole way, you know, trying to source for things, takes hours, takes time; so, my peers will be like, you are taking longer than you should; you are taking longer than everyone. Therefore, with my classmates in our discussion, they were like, use ChatGPT, use ChatGPT to help you with that. Therefore, I started thinking that, okay; sometimes they will tell you directly that, oh, why not use AI?

These excerpts illustrate the key role that AI plays in the adjustment of participants to their new learning environment. Drawing from a sociocultural perspective, we can contend that AI is scaffolding participants' adjustment into the academic environment.

Brainstorming and writing

Brainstorming ideas and writing academically are other ways in which participants collaborate with AI in their learning. Talking about AI's role in her learning, Rene explains "It can help you settle in, know what to write and what not to write." Alyma, working on a conference paper, discusses how she utilizes AI to make her writing coherent: "I'm writing, like, a vignette for my students that I'm watching, and I wrote, and I copied and pasted it. I said, make sure the paragraph is correct and coherent." To assist with academic writing, Bern says the following: "Okay, so, also, I use it, maybe paraphrasing some statements, yeah. Therefore, I write whatever I understood from the paper, then I use either Grammarly or ChatGPT for them to paraphrase and make it sound nice." Phanos states:

also, I do use it to brainstorm ideas. Maybe, like, there's something I want to design, or I do not truly know how, to, you know, like, kickstart the idea in my head, so it could actually give me highlights of how I can be so... to brainstorm. Additionally, I use it to get, guidelines for write-ups, too. You know, if there are some kind of write-offs you want to make, maybe, like, research write-off, or maybe, like, presentation write-off. You want to see which should come first, which should come second, and the way it flows.

On the basis of the excerpts above, "brainstorming" and "writing" are activities that participants are now working with AI to complete. AI is becoming a thinking partner as well as writing support for these students. However, these graduate students acknowledge that the overreliance on AI to

complete certain activities, such as writing and even summarizing, is not advisable. For instance, Alyma says,

it offers help to us as students. I cannot say I will not use ChatGPT, but I have to use it responsibly. Responsibly here means making sure that I am doing what I am supposed to do as a student, because even textbooks or the articles we read are also tools that help us to learn, just like AI. Therefore, we can leverage it. However, when it has to do with your writing, your thinking, or your thought patterns, that is what graduate school is about, sharing your thoughts. Therefore, that is why I like the fact that when you go to class, your lecturer is not telling you what is right or what is wrong, but it is facilitating a session where you yourself would have to think critically and put together what you think is right.

Working toward leveraging AI to facilitate their learning while ensuring that graduate students still engage in activities essential to graduate learning is essential for them. In other words, participants believe that AI should not be completely trusted because AI responses are sometimes misleading. Phanos argues for the need to always be critical about AI findings: “If AI is giving me anything now, I’d be like, no, I think let me first find what is at the back of that.” Irma also cautions that AI should be used to “help you develop your writing, or upgrade your writing, but never rely on it as someone who would do the job for you.” This shows that participants are conscious of the danger that AI may present, specifically in relation to learner’s skills and agency. “However, we do not have to rely on it 100%,” Irma adds. Therefore, using AI to brainstorm and write develops participants’ writing skills, turning AI into a learning space.

Learning method and learning companion

The analysis also reveals that participants see AI applications as a learning space. It provides immediate feedback on course/assignment-related challenges. Bern captures this as follows:

Therefore, if I’m writing the code, and usually I use SmartLab in Julia programming languages, so if I write the code, and I run it, and I get an error, and I do not know what is happening in the code, I just copy the code, and the error and paste it in either DeepSeek or ChatGPT and tell them... and ask them to tell me what is going on. What did I do wrong? And they will explain the error? For me, then I will try and fix it I would not say it is a waste; it’s a way of helping us to learn...Therefore, ChatGPT is kind of the fastest way to go, yeah, so it is a way of learning. A way of learning, too, yeah. Therefore, it is not a waste of time.

Alyma concurs when she explains that international students should:

Use it in a way that when you learn, and use it as a companion for you, or a buddy that you can learn with, not as someone that can do the job for you, because you will end up ... losing your time, and not learning anything.

Describing AI as a learning method, a companion, and a learning “buddy” illustrates participants’ conceptualization of their relationships and collaboration with AI as they determine how to navigate learning in a new setting. This also shows how students personify, transfer or assign human-like characteristics to AI. AI appears to play the role that a peer could take in some parts of participants’ learning journeys. This place and role given to AI can also be noted in the other labels given to AI, such as “friend” or “secret friend”, by participants, which reflects a kind of human–AI collaboration.

Although participants acknowledge the importance of AI applications in their learning, they are also careful to create a balance between AI and their person. In other words, participants do not want to relinquish their abilities to think, create, and converse to AI. This explains why Bern says, “If you overrely on the AIs, it will make you... dumb.” This is a statement of Bern’s conviction that humans are smarter than AI and, as such, should not surrender all their activities/tasks to AI. Participants seem to argue for students to maintain their abilities and maintain a certain balance between human and AI relationships; students need to maintain their human identity and not be absorbed or dominated by AI. This sentiment can also be noted when Irma says the following: “so, I’m always with, yes to using technology to facilitate life for you, but not using technology to do life for you, or to do the task.” Phanos goes a step further and discusses the potential of AI to mislead users, which highlights the importance of a critical lens when working with AI. Given that AI is likely to mislead, Phanos, in the following excerpt, advised international students to engage with discussions and research on AI in different settings, including conferences and seminars: “they can give you wrong answers; we have seen cases like that, and you actually want to, like, attend AI seminars, any seminar, or perhaps, like, conferences that talk about AI. You go there, you see what people are talking about, what is out there now, some of the research that is ongoing, and some of the challenges.”

DISCUSSION

The findings illustrate the mediating role that AI plays in international African graduate students’ learning. Our findings indicate that AI has become an integral part of these students’ learning in the United States. From a sociocultural learning perspective, learning occurs through interactions with the cultural environment and the technology within (Kahlike et al., 2019). AI shapes learning in this new learning setting. For instance, AI is useful for demystifying or simplifying academic literature such as assigned articles. Making sense of academic content or using AI to help understand academic readings and concepts aligns with recent research that has shown

that AI assists students in making academic materials more understandable (Ma et al., 2025). Although the international students in Ma et al.'s (2025) study were from China and not particularly graduate students, we note a similar use of AI by international students in our study. Our study also revealed that AI saved participants' time, allowing them to quickly complete some academic tasks, such as reading articles. Similar findings were reported by Wu and Yu (2024), who revealed that cognitively, AI enhances students' task efficiency. As Arslan et al. (2025) and Nazir (2026) explain, who explain that international students utilize AI tools to summarize articles and generate ideas, our study equally shows that proofreading, summarizing articles, brainstorming and writing are other ways in which participants interact with AI in their learning. Research demonstrating students' use of AI to summarize, brainstorm, and write does not necessarily focus on international graduate students (Arslan et al., 2025; Nazir, 2026). Our research does confirm that the learning needs of international students are not different from those of other students or peers. Although international students have unique needs (e.g., language, cultural barriers, loneliness, and cultural adjustment) (Wilczewski et al., 2025), the learning demands and academic workload are identical for all students in American higher education.

Participants portray AI as a companion and a secret friend, as they pursue AI support rather than peer support; thus, they attribute humanlike characteristics to AI, which aligns with the findings of previous studies (Crawford et al., 2024). This form of collaboration between students and AI is known as AI anthropomorphism, which in the literature is the act of ascribing human characteristics to nonhuman entities (Pelau et al., 2021). Anthropomorphism occurs because of how AI influences the new learning setting and constrains participants' behavior (Kahlke et al., 2019). Ma et al. (2024) reported that AI can be seen by international students as a carrier of emotional resources that can successfully replenish their emotional and psychological needs and expenditure. Therefore, it is not surprising that the participants in this study described AI as a secret friend, a companion, or a learning method. From a sociocultural perspective, we found that AI also helps in the adjustment of participants, given the mediating role that AI plays in assisting students in their adaptation to the learning demands of their new environment. Interestingly, studies have reported the role of AI in the cultural adaptation of international African graduate students in their new environment, indicating that AI anthropomorphism may explain why AI influences international students' sociocultural adaptation (Ma et al., 2025). Although we concur with other studies that AI contributes to the adjustment of international students, our findings do not clearly relate the critical role of AI to anthropomorphism (Su et al., 2025). Nevertheless, the findings align with previous research on the role of AI in the adjustment of international students. This research further demonstrates that, irrespective of its origin, AI is part of the learner sphere. Institutions of higher education should embrace

this fact and work toward educating students on how to collaborate with AI ethically and thoughtfully.

In light of the growing concerns about the impact of AI on the environment, cognition, national sovereignty, labor, education, spirituality, and humanity (Hao, 2026; Morris, 2024; Oyebanji et al., 2025), it is essential for institutions of higher learning to critically engage students in these debates. AI literacy is no longer enough (i.e., understanding what AI is and how to use it); developing critical AI literacies among learners, that is, the ability to critique (Bayeck et al., 2024); developing solutions/alternatives to AI issues; recognizing AI potential and limits; identifying AI threats to humanity, the environment, spirituality; and distinguishing truth from propaganda and fiction from reality.

Conclusion

Our study reveals that AI is increasingly playing a critical role in the learning journeys of international African graduate students in the United States, with students engaging in AI-mediated learning. AI shapes students' learning by assisting in proofreading writings, in understanding complex academic texts through summaries, in mediating their participation in the learning community by helping with writing, and in becoming a learning method for these students. Our study further reveals how participants use AI to adjust to their new learning environment and cope with the emotional needs exacerbated by the new cultural environment, which explains their conception of AI as a friend, a companion, and a buddy. We add to the conversation about AI and learning among international students, particularly international African graduate students in the United States.

Limitations and Further Study

This study focused on a selected number of participants, which likely limits the implications of these findings. However, the findings still provide insights into how and why international graduate students collaborate with AI in their academic journeys. The results of this study can therefore be useful for institutions of higher education, as they can understand how to prioritize topics such as ethics and AI and possibly make mandatory introductory courses to AI (AI literacies) to ensure that students are equipped with the information necessary to navigate their new learning environment. We argue that similar to orientation universities offer to incoming students, courses on AI should be offered to incoming international students to facilitate their transition into a new learning environment. Nevertheless, further studies should be conducted to understand whether AI enhances academic achievement and retention among graduate students, particularly international graduate students.

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