




Bridging the Gaps: Exploring AI-Driven Emotional, Academic, and Social Support for International Students

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ABSTRACT

The integration of Artificial Intelligence (AI) tools into the academic and social lives of international students has opened new pathways for support during their transitions. This qualitative study explores the multifaceted role of AI-driven platforms in addressing the emotional, academic, and social challenges faced by international students in Turkey. Thematic analysis of semi-structured interviews with 30 participants revealed four overarching themes: emotional support, academic facilitation, social integration, and Ethical Concerns, each accompanied by unique sub-themes. AI tools such as ChatGPT, Replika, and Duolingo provided emotional relief during isolation, simplified complex academic concepts, enhanced language proficiency, and boosted communication confidence in social contexts. However, participants also expressed concerns about over-reliance and data privacy, highlighting ethical considerations in the adoption of AI tools. These findings underscore the potential of AI to complement traditional support systems and provides valuable insights for educators, policymakers, and developers aiming to leverage AI in enhancing the experiences of international students.

KEYWORDS

Artificial Intelligence; challenges; ChatGPT; international students; support system

1. Introduction

Globalization has dramatically expanded the landscape of higher education, leading to a significant increase in the number of students pursuing academic opportunities abroad. According to the latest UNESCO data, over 6 million students are currently enrolled in universities outside their home countries, with this number expected to grow further in the coming years (UNESCO, 2023). Among the emerging destinations for international education, Turkey has established itself as a prominent hub, playing an increasingly pivotal role in the global higher education landscape (Oz, 2021). This shift is evidenced by a remarkable surge in the enrolment of international students in Turkey, which rose from 43,251 in 2013 to an extraordinary 301,694 in 2023 (Education, 2023).

Despite the opportunities offered by studying abroad, international students often encounter multifaceted challenges that can adversely impact their academic performance, emotional resilience, and social integration (Hingle, 2023). These difficulties are exacerbated by the stress of adjusting to unfamiliar cultural environments, meeting demanding academic expectations, and experiencing emotional isolation due to limited support networks (Kim, 2024; Myers-Walls et al., 2011). In response to these challenges, recent advancements in Artificial Intelligence (AI) have paved the way for innovative solutions. AI-driven tools, designed to provide emotional support, enhance academic

performance, and facilitate social adaptation, have emerged as transformative resources to help international students navigate these complexities more effectively.

Emotional resilience, defined as the ability to adapt positively to stress and adversity, is critical for international students (Sabouripour & Roslan, 2015). Emotional challenges such as homesickness, loneliness, and anxiety are prevalent among this population, often due to their physical separation from family and familiar support networks (Zhou & Cole, 2017). AI-driven emotional intelligence tools, including Replika, Woebot, and Wysa, offer 24/7 support to users, creating a safe and empathetic space for them to express their emotions. Fitzpatrick et al. (2017) highlighted the efficacy of AI-based chatbots in reducing feelings of loneliness and providing mental health support. These tools employ conversational AI to simulate empathetic responses, allowing students to discuss their feelings without fear of judgment or stigma.

In addition, Wysa's evidence-based strategies for cognitive-behavioral therapy (CBT) have been found to significantly improve emotional well-being among users (Inkster et al., 2018). Such tools are particularly valuable for international students, as they are accessible at all hours and bypass potential barriers to seeking traditional counseling, such as cultural stigma or financial constraints (Ana & Ana, 2024).

Adapting to a new cultural environment is another major hurdle for international students. Berry's (1997) Cultural Adjustment Theory posits that successful adaptation requires a combination of cultural knowledge and social confidence.

However, international students often struggle with understanding cultural norms, language barriers, and feelings of alienation in their host countries (Smith & Khawaja, 2011). AI tools such as CulturAI and Duolingo help students bridge these gaps by providing real-time guidance on cultural practices and enabling language learning in an interactive, non-intimidating environment.

Duolingo, for instance, uses gamification to make language learning engaging and effective, while CulturAI offers culturally tailored advice for social and professional interactions. Studies by Xia et al. (2024) and Lim (2024) found that AI-supported language learning significantly enhanced students' linguistic competence and social confidence, enabling smoother integration into their academic and social environments. These tools not only address linguistic challenges but also equip students with the cultural competence needed to thrive in diverse settings.

Academic performance is often a key stressor for international students, who must navigate unfamiliar educational systems and higher expectations (Afoakwa-Acheampong, 2024). AI tools such as ChatGPT, Grammarly, and Quizlet have emerged as critical resources for improving academic outcomes. For instance, Grammarly offers real-time grammar correction and style suggestions, helping students improve their academic writing skills, while Quizlet aids in memorizing and understanding course material. AbuSahyon et al. (2023) demonstrated that personalized feedback from AI tools enhances students' learning outcomes, particularly in language acquisition and complex subject areas.

ChatGPT, an AI-powered conversational platform, plays a multifaceted role in academic facilitation. It simplifies complex concepts, provides step-by-step problem-solving guidance, and generates ideas for essays and assignments. For STEM students, ChatGPT's ability to explain intricate theories and calculations in an accessible manner has proven invaluable (Chima et al., 2024; Falebita & Kok, 2024). Moreover, its 24/7 availability ensures that students can seek assistance at any time, addressing a gap often left by traditional academic support systems.

Despite these advantages, the integration of AI tools is not without ethical challenges. Over-reliance on AI can potentially hinder students' critical thinking skills and problem-solving abilities (Zhai et al., 2024). Additionally, concerns about data privacy and security remain significant barriers to the full adoption of these tools (Oluwatoyin et al., 2024; Wang et al., 2024). Many students hesitate to share personal information on AI platforms due to uncertainty about how their data will be stored or used. Building trust through transparent data management policies and educating users about ethical AI practices are essential for addressing these concerns (Kastania, 2024; Schmidt et al., 2020; Wang et al., 2024).

While existing research has explored the benefits of AI tools in isolation, few studies have examined their combined impact on emotional, social, and academic domains for international students. Additionally, the qualitative experiences of users remain underexplored, particularly in understanding how these tools influence their daily lives and

adaptation processes. Ethical concerns, such as the long-term effects of AI dependence and data security, also warrant further investigation (Ozmen Garibay et al., 2023; Stephanidis et al., 2019). This study seeks to address these gaps by providing a holistic analysis of how AI tools contribute to international students' emotional resilience, social adaptation, and academic success while also highlighting the ethical challenges involved.

1.1. Theoretical foundations

The theoretical foundation of this study integrates three complementary frameworks to comprehensively analyze the role of AI tools in supporting international students. Berry's Cultural Adjustment Theory underscores the importance of cultural competence and social integration as pivotal factors for successful adaptation (Berry, 1997). This perspective illuminates how AI tools facilitate students' navigation of cultural norms and social expectations, thereby aiding their integration into new environments. Emotional Intelligence Theory (Goleman, 1996) highlights the critical role of self-awareness, empathy, and emotion regulation in managing stress and building resilience. AI tools, through their ability to simulate empathy and provide non-judgmental emotional support, align closely with these principles, fostering users' emotional well-being. Additionally, the Technological Acceptance Model (Davis, 1989) offers insight into the factors influencing the adoption of AI tools, emphasizing perceived usefulness and ease of use as determinants of user engagement. By synthesizing these frameworks, the study elucidates how AI tools mediate the interplay between emotional resilience, social adaptation, and academic performance while also addressing the ethical challenges that arise in their application.

1.2. Research questions

To address the identified gaps in literature and build on the theoretical foundation, this study explores the following research questions:

RQ1. How do international students perceive the role of AI-driven tools in supporting their emotional resilience and well-being?

RQ2. In what ways do AI tools facilitate social adaptation and cultural integration for international students?

RQ3. How do AI platforms contribute to academic success by addressing challenges such as language proficiency and complex subject matter?

RQ4. What ethical concerns, including over-reliance and data privacy, arise from the use of AI tools among international students?

By addressing these questions, this study seeks to uncover the transformative potential of AI in supporting international students, offering valuable insights for educators, policymakers, and technology developers. It aims to provide a comprehensive framework for leveraging AI in higher

education, balancing its benefits with ethical considerations to ensure its effective and responsible use.

2. Materials and methods

This study employed a qualitative research design to explore the role of AI-driven tools in supporting emotional resilience and social adaptation among international students. This approach was chosen for its ability to capture the depth and complexity of participants' lived experiences, making it particularly suitable for understanding how emerging technologies influence personal and academic adaptation processes. Semi-structured interviews were conducted to elicit detailed insights into participants' use of AI tools for academic assistance, emotional support, and cultural adaptation, as well as their perceptions of its impact on their overall well-being and social integration.

2.1. Research team

The study was conducted by the author, a counseling psychology researcher with extensive experience in qualitative methodologies and clinical practice. The author's background in mental health counseling and familiarity with the integration of AI tools provided both practical and theoretical depth to the research. Recognizing the potential influence of preconceived notions regarding AI's role in therapy, the author actively engaged in reflexive practices throughout the research process. These included critically reviewing existing literature, maintaining objectivity during participant interviews, and applying rigorous analytical methods to ensure impartial and balanced interpretation of the data.

2.2. Sample

A purposive sampling strategy was used to recruit 30 international students from universities in Istanbul. The sample included 19 females (63.3%) and 11 males (36.7%), with an overall mean age of 24.1 years ($SD = 2.1$). Participants represented diverse cultural and educational backgrounds, with a mix of undergraduate and postgraduate students to ensure inclusivity and variability in perspectives. Participants were from diverse countries and were geographically categorized into five regions: Southeast Asia, the Indian Subcontinent, the Balkans, Central Asia, and Africa. Approximately 94% (28) of the participants reported using AI-driven tools actively for academic, social, or emotional purposes, while others had limited familiarity with its potential applications. This diverse cohort provided a comprehensive understanding of AI-driven tools role in facilitating international students' academic and cultural transitions. The below Table 1 shows the demographic features of the participants.

2.3. Ethical permission

Ethical approval for the study was obtained from the Ethics Committee of Ibn Haldun University with reference number E-71395021-050.04-50848, adhering to all guidelines

for research involving human participants. Written informed consent was secured from all participants after providing detailed information about the study's purpose, procedures, and confidentiality measures. Pseudonyms were assigned to participants to ensure anonymity, and all identifiable information was removed from transcripts. Data were securely stored and used solely for research purposes.

2.4. Data collection

Data collection involved 30 semi-structured interviews conducted face-to-face and via Zoom. In total 9 interviews were conducted via Zoom, and 21 interviews were conducted face-to-face, based on participant preferences. Each interview lasted between 45 and 60 min. Before each session, participants were briefed about the study's objectives, and rapport was established to create a comfortable and open environment. Interview questions were designed to explore participants' experiences and perceptions, such as:

IQ1. "How has AI-driven tools influenced your ability to adapt academically and socially?"

IQ2. "In what ways has AI-driven tools helped you navigate cultural challenges?"

IQ3. "What do you think about the potential risks, such as over-reliance or data privacy, associated with AI-driven tools?"

IQ4. "Can you describe any specific instances where AI-driven tools supported you during stressful situations?"

This flexible approach allowed for probing deeper into participants' responses while maintaining consistency across interviews. Audio recordings of the interviews were transcribed verbatim and translated where necessary to ensure accuracy.

3. Data analysis

The data were analyzed using thematic analysis, following Braun and Clarke (2021) framework, supported by NVivo (version 12; QSR International) for qualitative data management. Familiarization involved repeated reading of interview transcripts to identify emerging patterns and recurring concepts. Codes such as "language learning," "stress management," "cultural adaptation," and "privacy concerns" were labelled during the initial coding phase. This process led to broader themes like "Emotional Support through AI-Driven Tools," "Academic Support and Facilitation," "Social Integration and Cultural Adjustment," and "Ethical Concerns and Challenges," which were refined to align with study objectives and research questions. Sub-themes, including "Coping with Isolation and Loneliness" and "Simplifying Complex Academic Concepts," captured nuanced participant experiences. Table 1 Themes and sub-themes extracted from the opinions of the participants.

Two research assistants independently coded the first four transcripts using an inductive, exploratory approach to establish an initial coding framework. Codes were refined through collaborative discussions, resolving discrepancies through consensus. NVivo functions, such as word frequency analysis and

coding queries, facilitated systematic comparison and ensured consistency across transcripts. Reflexivity was maintained through team discussions and memoing, documenting coding decisions and analytical insights. Intercoder reliability was assessed, with agreement exceeding 85%, ensuring the rigor of the analysis.

This iterative, collaborative process uncovered nuanced insights into how international students perceive and use AI tools for emotional, academic, and social support. Representative quotes were selected to illustrate each theme, enhancing authenticity and contextual depth. The final thematic

framework provides a robust foundation for discussing the multifaceted role of AI tools in supporting international students' adaptation processes.

4. Results

After conducting thematic analysis, Table 2 summarizes the themes and sub-themes derived from participants' opinions, showcasing the diverse ways AI tools contributed to emotional support, academic facilitation, social integration, and the ethical challenges encountered by international students.

Table 1. Shows of international students by region, gender, education level, and AI usage (n = 30).

Participant ID	Region	Grade	Gender		Use of AI
			Male	Female	
P1	Southeast Asia (Indonesia, Malaysia, Thailand)	Undergrad	1	2	3
P2					
P3					
P4	Indian Subcontinent (India, Pakistan, Bangladesh, Afghanistan)	Masters	1	2	3
P5		Undergrad	2	3	5
P6					
P7					
P8					
P9					
P10	Masters	1	2	3	
P11	Balkan Countries (Serbia, Croatia, Bosnia and Herzegovina, Albania)	Undergrad	1	3	4
P12					
P13					
P14					
P15					
P16					
P17	Central Asia (Azerbaijan, Kazakhstan, Uzbekistan)	Undergrad	1	2	3
P18					
P19					
P20					
P21					
P22					
P23	African Countries (Nigeria, Kenya, Ethiopia, Egypt, Ghana)	Undergrad	1	1	1
P24					
P25					
P26					
P27					
P28					
P29	Total		11	19	28
P30					

Table 2. Themes and sub-themes extracted from the opinions of the participants.

Theme	Sub-theme	Key insights
Emotional Support through AI-Driven Tools	Coping with Isolation and Loneliness	AI tools like Replika and Woebot provided emotional relief during periods of loneliness.
	Managing Academic Stress and Anxiety	ChatGPT and CAiRE offered structured plans and emotional reassurance during academic stress.
	Simulating Empathy	ELIZA and DialoGPT simulated empathetic responses, creating a sense of emotional connection.
Academic Support and Facilitation	Enhancing Language Proficiency	ChatGPT and Duolingo supported personalized language learning and conversational practice.
	Simplifying Complex Academic Concepts	ChatGPT simplified complex academic concepts for better understanding, especially in STEM fields.
	Supporting Academic Writing	Grammarly and ChatGPT supported brainstorming, structuring essays, and refining academic writing.
Social Integration and Cultural Adjustment	Bridging Cultural Knowledge Gaps	CulturAI and ChatGPT offered guidance on cultural norms, helping students adapt.
	Boosting Communication Confidence	ChatGPT and Duolingo enabled practice for social interactions, boosting confidence.
Ethical Concerns and Challenges	Navigating Group Dynamics	ChatGPT provided strategies for conflict resolution in group settings.
	Fear of Over-Reliance	Participants expressed concerns about losing critical thinking due to over-reliance on AI tools.
	Privacy and Data Security	Data privacy concerns emerged, emphasizing the need for transparency in AI platforms.

4.1. Theme 1: Emotional support through AI-driven tools

4.1.1. Subtheme 1: Coping with isolation and loneliness

International students frequently relied on AI-driven tools such as Replika, Woebot, Wysa, and FreeAITherapist to alleviate loneliness and homesickness. These tools acted as non-judgmental companions, providing emotional relief and fostering a sense of connection despite being artificial. As one participant expressed:

When I felt lonely and didn't want to burden my family, Replika was there. It let me talk through my feelings and helped me feel less alone. [Participant ID 7]

Another participant noted how engaging with Woebot helped process emotions more effectively:

Sometimes, I'd write about my day, and even though it wasn't a person, Woebot responded thoughtfully, and that was enough to make me feel heard. [Participant ID 12]

This accessibility allowed participants to share their emotions freely, creating a sense of routine and emotional stability.

4.1.2. Subtheme 2: Managing academic stress and anxiety

Participants turned to AI tools like ChatGPT, CAiRE, and FreeAITherapist to manage academic stress during high-pressure periods such as exams or deadlines. These tools provided task prioritization, organizational strategies, and emotional reassurance. As one participant shared:

I had too many deadlines piling up, and ChatGPT helped me prioritize my tasks. It felt like having an organizer at my side. [Participant ID 3]

Another participant highlighted the calming effect of CAiRE during moments of stress:

CAiRE suggested mindfulness exercises when I was overwhelmed, and they really helped me stay focused. [Participant ID 10]

This combination of practical advice and emotional support made these tools indispensable during critical academic moments.

4.2. Theme 2: Academic support and Facilitation

4.2.1. Subtheme 1: Enhancing language proficiency

For many international students, language proficiency barriers were a significant challenge, particularly in learning Turkish. AI tools such as ChatGPT, Grammarly, and Duolingo provided real-time corrections, conversational practice, and contextual feedback to support language learning. A participant explained:

When I didn't know how to say something in Turkish, I asked ChatGPT, and it gave me examples. It was like having a language tutor available 24/7. [Participant ID 8]

Another participant shared their experience with Grammarly:

Grammarly helped me refine my grammar and understand my mistakes, which boosted my confidence in speaking and writing. [Participant ID 13]

These tools' tailored feedback made them indispensable for students striving to improve their communication skills.

4.2.2. Subtheme 2: Simplifying complex academic concepts

AI tools, particularly ChatGPT, played a vital role in helping students understand complex academic concepts in STEM fields. The step-by-step explanations provided by ChatGPT allowed students to overcome learning challenges. One participant shared:

Statistics lectures were hard to follow, but ChatGPT explained things like standard deviation in a way I could finally understand. [Participant ID 5]

Another participant emphasized the personalized nature of ChatGPT's explanations:

When I was stuck on calculus, ChatGPT started with basic examples and slowly built up to complex ones, which made learning easier. [Participant ID 9]

This adaptability ensured students could engage with difficult subjects at their own pace.

4.3. Theme 3: Social integration and cultural Adjustment

4.3.1. Subtheme 1: Bridging cultural knowledge gaps

Participants used AI tools like CulturAI and ChatGPT to navigate unfamiliar cultural norms and etiquette in Turkey. These tools provided real-time guidance on appropriate social behaviors, helping participants avoid potential misunderstandings. For example:

I asked CulturAI how to greet my professor in Turkey, and it told me about formal and informal ways. That saved me from embarrassment. [Participant ID 6]

Another participant described how Culturfy helped them prepare for a cultural event:

I was invited to a traditional dinner, and Culturfy explained the significance of the dishes and how to express my appreciation politely. [Participant ID 8]

These tools served as cultural guides, enabling participants to adapt confidently to their new environment.

4.3.2. Subtheme 2: Boosting communication confidence

By simulating conversational scenarios, tools like ChatGPT and Duolingo helped students rehearse for social interactions and presentations. As one participant explained:

I practiced small talk with ChatGPT and Duolingo before attending a student event. It gave me ideas on what to say, and I felt more comfortable meeting new people. [Participant ID 4]

Another participant shared how ChatGPT helped them prepare for a class presentation:

ChatGPT guided me in organizing my points and even suggested ways to sound more confident while speaking. [Participant ID 24]

This practice not only reduced anxiety but also enhanced their ability to communicate effectively in social and academic settings.

4.4. Theme 4: Ethical concerns and challenges

4.4.1. Subtheme 1: Fear of over-reliance

Despite their benefits, participants voiced concerns about over-reliance on AI tools, which they feared could undermine critical thinking and problem-solving skills. One participant noted:

I worry that I'm using ChatGPT too much, and I'm not solving problems on my own anymore. [Participant ID 14]

Another participant emphasized the importance of balancing AI use:

I try to only use ChatGPT when I'm truly stuck. It's a great tool, but I need to rely on my own thinking first. [Participant ID 5]

These statements highlight the need for students to maintain a balanced approach to using AI tools.

4.4.2. Subtheme 2: Privacy and data security

Data privacy concerns emerged as a significant barrier to full adoption. Participants were apprehensive about the lack of clarity regarding how their data was stored and used. One participant shared:

I don't know what happens to the data I type in. That makes me cautious about sharing personal details. [Participant ID 1]

Another participant expressed concern about the broader risks of data security breaches:

You hear about companies getting hacked all the time, and it makes me think, what if my data from ChatGPT ends up somewhere it shouldn't? [Participant ID 22]

These concerns underscore the importance of transparent data policies to foster trust among users.

5. Discussion

This study highlights the multifaceted role of AI-driven tools in supporting international students as they navigate the challenges of academic, social, and emotional adjustment in a new environment. The findings reveal that AI tools like Replika, Woebot, and ChatGPT offered emotional support by acting as non-judgmental companions and providing coping strategies for loneliness, homesickness, and academic stress. AI tools also enhanced academic performance by simplifying complex concepts and addressing language barriers. Social integration was facilitated by platforms like CulturAI, which bridged cultural knowledge gaps and bolstered communication confidence. However, concerns regarding over-reliance on AI and data privacy emerged as significant barriers to their full adoption.

5.1. Emotional support and resilience

AI tools like Replika, Woebot, and FreeAITherapist served as essential emotional aids for students grappling with loneliness, homesickness, and stress. Their empathetic design and non-judgmental interactions enabled students to process

emotions in a safe, accessible environment. These findings resonate with Fitzpatrick et al. (2017), who demonstrated the effectiveness of AI-based CBT tools in reducing anxiety and depression. Moreover, the instant availability of AI tools, especially for students without immediate access to traditional social supports, aligns with Chin et al. (2023), who argued that digital tools are uniquely positioned to bridge emotional care gaps for marginalized groups. However, participants acknowledged that AI lacks the depth of human empathy, echoing research by Boucher et al. (2021) that emphasized the irreplaceable nuances of human interaction in therapeutic contexts.

Culturally, Turkish collectivist traditions often emphasize family and community support (Sunar & Fisek, 2005). The reliance on AI for emotional relief among international students in Turkey may reflect a dissonance between their cultural expectations and available support systems. Future research could explore whether AI tools unintentionally reinforce isolation or serve as transitional aids until students establish local support networks.

5.2. Managing academic stress and anxiety

Participants frequently turned to AI platforms such as ChatGPT and CAiRE to alleviate academic pressures, particularly during peak periods of stress. These tools' dual functionality—as organizational aids and emotional supporters—reflects their adaptability, as highlighted by Shi (2025), who discussed the holistic potential of AI in academic settings. Moreover, their utility during late-night study sessions, when traditional support systems were inaccessible, underscores their value in supplementing institutional resources.

However, the issue of over-reliance raises important questions. Baron (2024) warned of the cognitive risks associated with habitual dependence on AI for decision-making, which may impair critical thinking and self-regulation. This concern was echoed by participants who expressed fears about diminishing problem-solving abilities. Addressing these risks requires balanced integration strategies that encourage students to use AI tools as supplementary resources rather than primary problem-solvers.

5.3. Academic support and Facilitation

The study highlighted the pivotal role of AI tools in addressing language barriers and simplifying complex academic concepts. Tools like Grammarly, Duolingo, and ChatGPT provided personalized, real-time feedback, enabling students to overcome linguistic and conceptual challenges. These findings are supported by Jegede (2024), who emphasized the role of AI in facilitating second-language acquisition through adaptive learning technologies. Similarly, Chin et al. (2023) highlighted AI's ability to demystify dense academic materials by tailoring explanations to individual comprehension levels.

However, the findings suggest a gap in the cultural contextualization of these tools. While participants benefitted from AI's technical guidance, the tools did not always

account for the cultural and linguistic nuances of the Turkish educational system. Integrating culturally informed content into AI tools could enhance their relevance and effectiveness for diverse student populations.

5.4. Social integration and cultural adjustment

AI tools like CulturAI and ChatGPT played a crucial role in bridging cultural knowledge gaps and fostering communication confidence. By providing real-time guidance on etiquette and social norms, these tools helped students navigate unfamiliar cultural landscapes with greater ease. These findings align with Berry (1997) Cultural Adjustment Theory, which underscores the significance of cultural competence in successful adaptation. Moreover, Zhang et al. (2024) emphasized the importance of confidence-building exercises in improving cross-cultural communication, a benefit mirrored in the participants' experiences with AI tools.

Despite these advantages, the reliance on AI for cultural navigation raises concerns about its potential to perpetuate surface-level cultural understanding. Sawir et al. (2008) argued that genuine cultural adaptation requires immersive, human-mediated experiences. While AI tools provide valuable initial guidance, they cannot substitute for the depth of interpersonal cultural learning.

5.5. Ethical concerns and challenges

The study illuminated significant ethical challenges associated with AI adoption, particularly over-reliance and data privacy concerns. Participants expressed fears that habitual dependence on AI could undermine their cognitive autonomy, a risk supported by George et al. (2024), who highlighted the potential erosion of critical thinking skills in digitally dependent learners. Additionally, concerns about data privacy and security emerged as critical barriers to the full adoption of AI tools. These findings are consistent with Vigurs et al. (2021), who noted that transparency in data handling policies is essential for fostering user trust. Addressing these concerns will require robust ethical frameworks, clear communication about data use, and the implementation of privacy safeguards.

The findings illustrate the transformative potential of AI-driven tools in addressing the unique challenges faced by international students. However, they also highlight the need for balanced usage, ethical safeguards, and ongoing research to maximize the benefits of these technologies while mitigating their risks. By aligning with and extending existing literature, this study contributes to a deeper understanding of how AI can be effectively integrated into support systems for international students.

6. Conclusion

This study sheds light on the transformative role of AI-driven tools in addressing the multifaceted challenges faced by international students, including emotional resilience, academic performance, and social integration. Through thematic analysis,

we identified how these tools, such as ChatGPT, Replika, Grammarly, and CulturAI, provide accessible, personalized, and empathetic support, serving as a bridge between students' needs and their evolving academic and social environments.

The findings emphasize the critical importance of AI tools in mitigating emotional challenges like loneliness and academic anxiety, while also enhancing language proficiency, simplifying complex academic concepts, and fostering social confidence. These tools enable international students to navigate the complexities of a new cultural and educational landscape, often filling gaps in traditional support systems through their 24/7 availability and tailored assistance. However, concerns about over-reliance and data privacy highlight the need for a balanced approach in the integration and use of AI technologies.

Institutions have an opportunity to harness these tools to complement existing support services, ensuring students receive holistic assistance that bridges emotional, academic, and social domains. Clear guidelines on ethical data practices and digital literacy training are essential to foster trust and encourage responsible use of AI platforms.

Future research should delve deeper into the long-term implications of AI on students' cognitive and emotional development, exploring ways to optimize these tools while minimizing potential risks. By addressing the ethical and functional limitations, AI tools can become even more impactful in creating inclusive, adaptive, and supportive environments for international students worldwide.

AI-driven tools offer a unique and innovative approach to supporting international students in their academic and cultural transitions. When integrated responsibly and ethically, these technologies hold immense potential to enhance the overall well-being and success of students navigating the complexities of a globalized education system.

7. Implications

The findings underscore the transformative potential of AI tools in supporting international students but also highlight the need for balanced integration strategies. Institutions should develop comprehensive training programs to promote digital literacy, emphasizing the supplementary role of AI tools. Developers should prioritize the cultural contextualization of AI platforms, ensuring their relevance to diverse educational settings. Ethical concerns must be addressed through transparent data policies and robust privacy protections.

8. Limitations

This study is not without limitations. The sample was drawn exclusively from international students in Turkey, which may limit the generalizability of the findings to other cultural or educational settings. The reliance on self-reported data may also introduce biases, as participants may overstate or understate their reliance on AI tools. Additionally, the cross-sectional design of the study limits the ability to draw conclusions about the long-term effects of AI use on students'

emotional resilience, academic performance, and social integration. Future studies should consider longitudinal designs to examine these impacts over time.

9. Recommendations

Building on these findings, future research should explore the long-term implications of AI use on cognitive and emotional development among students. Comparative studies across diverse cultural and educational contexts would offer deeper insights into the global applicability of AI tools for international students. Additionally, examining the intersection of AI tools with traditional support systems, such as counseling services, can provide a more holistic understanding of how AI can complement existing resources. Lastly, more research on ethical considerations, particularly around data privacy and over-reliance, is needed to inform the development of AI platforms that are both effective and trustworthy. These recommendations aim to advance the understanding of AI-driven interventions in higher education and ensure their responsible integration into academic and personal support frameworks.

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Author contributions

Thseen Nazir conceived and designed the study, conducted the research, analyzed the data, prepared tables, authored and reviewed drafts of the manuscript, and approved the final version for publication.

Declaration of generative AI in scientific writing

During the preparation of this work the authors used Grammarly AI in order to enhance fluency and maintain an academic tone. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Ethical statement

Ethics approval for the study was obtained from the Ethics Committee of Ibn Haldun University (Approval No: E-71395021-050.04-50848), and all procedures were conducted in accordance with the ethical standards set by the university. Consent to participate was obtained from all participants prior to their involvement in the study.

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Data code and availability

The data that support the findings of this study are available on request from the corresponding author, TN.

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