

EXPLORING THE IMPACT OF AI DEPENDENCY AND PERSONALITY TRAITS ON SOCIAL, PSYCHOLOGICAL, AND EDUCATIONAL CHALLENGES AMONG STUDENTS

Laiba Rehman
(Corresponding Author)

M.Phil. Scholar, Department of Applied Psychology, The Women University, Multan.

Email: laibarehman831@gmail.com

Asma Bashir

Assistant Professor, Department of Applied Psychology, The Women University, Multan.

Email: asma.bashir@wum.edu.pk

Abstract

Artificial intelligence (AI) tools like ChatGPT, Copilot, and Gemini have dramatically changed how university students learn, write papers, conduct research, and handle academic stress. These advantages are paired with concerns about AI's potential social, psychological (self-esteem), and educational impacts. This study explored the link between AI reliance, personality traits, and the social, psychological, and educational difficulties faced by university students. The present study used a qualitative, exploratory approach, conducting semi-structured interviews with participants (N=10) to gather insights into students' lived experiences with AI. The interview findings showed that students use AI for efficiency, meeting deadlines, academic support, and idea generation, as well as for cognitive outsourcing. It also indicates reduced critical thinking, reliance driven by personality, less peer interaction, and mixed trust levels. The results emphasize AI's dual role as both an academic aid and a possible source of disengagement. The study concludes that AI should be promoted as a supportive learning tool rather than a substitute for independent thinking, peer collaboration, and teacher guidance. Recommendations are presented for students, teachers, counselors, universities, and policymakers to promote responsible, balanced, and psychologically healthy AI use in higher education.

Keywords: Generative AI Dependency, Personality Traits, Social Connectedness, Self-Esteem, Educational Stress, University Students, Pakistan.

INTRODUCTION

Artificial intelligence (AI) significantly impacts human behavior, social interactions, and institutional processes worldwide, especially during the technological advancement era of the twenty-first century. The use of AI tools in higher education has increased due to remote learning initiatives, greater digitalization, and expanding global internet access. Students are increasingly employing AI-powered tools for exam preparation, writing assistance, information retrieval, and problem-solving. Although AI has the potential to enhance efficiency and accessibility, scholars have expressed concerns about the effects of overreliance on AI tools, especially in developing countries where digital literacy levels differ. The growing dependence on AI could influence students' study habits, cognitive abilities, and mental health, making it an important focus of academic research.

In developing countries such as Pakistan, AI remains a primary focus, and students' engagement

increases through free access to AI chatbots and online tutoring systems. In Pakistani universities, students often face challenges such as heavy academic workload, competition, limited educational resources, and a performance-driven evaluation system. In these situations, AI tools can serve as a practical and convenient way to manage stress. While this reliance can sometimes be helpful, it may also worsen social, educational, and psychological outcomes (Huang et al., 2024).

Artificial Intelligence in Education

Artificial intelligence has become a key part of the education system, shaping how students learn and how educational practices are implemented. It can produce human-like content, offer academic support, and solve complex problems. Most students use these tools for writing assignments, studying for exams, and conducting research because they are accessible and practical. Scholars worry that unregulated use of generative AI might decrease critical thinking and originality (Bewersdorff et al., 2023). The ease with which students can generate answers for their needs may shift focus from personal learning to machines, potentially changing students' academic expectations.

The idea of AI dependency stems from earlier research on challenging technology use, such as smartphone addiction, internet addiction, and digital dependency. Researchers argue that AI isn't inherently addictive, but features like efficiency, instant feedback, perceived intelligence, and emotional satisfaction can lead to over-reliance, especially among those with low self-efficacy and low self-esteem (Brand et al., 2019). Unlike traditional tools, AI systems actively simulate human cognitive tasks, which might blur the line between support and replacement in the learning process. Perceived usefulness and trust also play a key role in AI dependency. A student who sees AI as reliable, unbiased, and accurate may develop excessive trust in AI's outputs, leading them to accept information unquestioningly (Shin, 2022). Such over-trust can be risky in education, where biases, inaccuracies, and superficial explanations can lead to problematic AI use.

Personality factors play a dynamic role in shaping how individuals interact with technology, including AI systems in education. Personality traits, known as the Big Five, consist of Conscientiousness, Extraversion, Openness, Agreeableness, and Neuroticism (Costa & McCrae, 2008), and are the best predictors of coping mechanisms, learning strategies, academic motivation, and technology use in educational settings. As artificial intelligence becomes more integrated into students' academic and personal lives, it is important to understand how personality traits influence AI use and reliance. This understanding is essential for explaining individual differences in students' social, educational, and psychological challenges.

One of the personality factors, neuroticism, is characterized by emotional instability, anxiety, and susceptibility to stress. A student with high neuroticism may display a negative self-attitude, including fear of failure, academic exhaustion, burnout, poor emotional regulation, and low self-efficacy, which may lead to excessive reliance on AI tools as a coping mechanism (Elhai et al., 2020). Conscientiousness includes self-directed behavior, self-discipline, and organization. Individuals higher in conscientiousness tend to manage their time and regulate themselves more effectively, and to persist in learning tasks, making them less dependent on AI tools (Marengo et al., 2024). Openness to experience, which encompasses creativity, exploration, and curiosity, has a more complex relationship with AI use. Students high in openness may be more inclined to use AI and processing technologies in their learning. However, excessive reliance on AI-generated content can potentially hinder creativity

EXPLORING THE IMPACT OF AI DEPENDENCY AND PERSONALITY TRAITS ON SOCIAL, PSYCHOLOGICAL, AND EDUCATIONAL CHALLENGES AMONG STUDENTS

by promoting predetermined outcomes and reducing originality (Kasneci & Kasneci, 2026). Therefore, it becomes difficult to distinguish between dependent and adaptive AI use. Agreeableness and extraversion also affect interactions with AI tools, especially in collaborative learning environments. Extraverted individuals tend to use AI less as a replacement for human interaction and more as a supplementary tool to facilitate communication and support learning. Conversely, introverted individuals may rely more on AI tools to avoid social interaction, which can lead to reduced communication, social withdrawal, and less peer engagement (Heffer et al., 2019). Agreeableness, characterized by acceptance, cooperation, and trust, may encourage students to accept AI-generated information without critical evaluation (Shin, 2021).

Social development is a key element in shaping students' overall educational experiences, especially in collectivist cultures where collaboration, communication, and interaction are essential for students' cognitive and academic growth through shared experiences. Students can enhance interpersonal skills, foster a sense of belonging, and build knowledge. Educational scholars emphasize that learning is inherently a social process, influenced by communication with teachers, peers, and the community. However, the traditional pattern of social interaction may change due to increased reliance on AI.

In higher education settings, the most effective pedagogical strategy is collaborative learning that enhances cognitive abilities, problem-solving, and interpersonal skills. However, AI-mediated learning environments may shift students' preferences toward individual, self-directed approaches, thereby reducing the need for collaboration. Students who rely on technology-driven knowledge and generate descriptions or explanations of answers might bypass group discussion, ultimately limiting exposure to diverse perspectives and shared experiences (Holmes, 2023). Over time, this practice may decrease social engagement and diminish the sense of belonging within academic communities.

Personality factors further clarify how AI dependence might shape social experiences. Students with high social anxiety and an introverted personality may turn to AI tools, which provide academic support without the pressure of social interaction. While AI may temporarily reduce social discomfort, long-term reliance could lead to avoidance behaviors, resulting in decreased confidence and social skills (D. Marengo et al., 2020).

Trustworthiness of AI is a vital factor influencing students' social behavior. Students who develop a high level of trust in AI may view the results from AI tools as more dependable than those from an instructor or peer. Shin (2021) argues that excessive trust in AI can shift authority away from human collaboration toward technology-driven learning, which can weaken peer learning dynamics. This change is particularly problematic in education, where shared learning and teamwork are key to academic growth.

In Pakistani culture, group affiliation and interpersonal relationships are central to social identity. Pakistani culture traditionally depends on peer instructions for emotional reassurance and academic support. Effective communication requires ongoing feedback and social interaction. When students depend on AI tools for draft writing, articulating ideas, and solving academic problems, their cognitive effort decreases, ultimately leading to poor decision-making and weakened critical thinking.

For students in Pakistan, it was found that those with higher social anxiety preferred to use AI for learning instead of working in groups because it reduces the pressure of interpersonal communication.

However, this preference was linked to declines in social skills over time (Khan et al., 2023). Students who use AI tools often perform worse in collaborative tasks and classroom discussions (Holmes, 2022), thereby diminishing their collaborative skills. A study of the digital learning behaviors of university students in Pakistan found a negative correlation between the frequency of AI tool use and student engagement.

Psychological Challenges Among Students

Students' academic success, social functioning, and overall quality of life depend on psychological well-being. University students face significant mental health challenges due to performance expectations, academic pressure, and transitional stressors associated with growing into adulthood (Abdullah et al., 2025). Recent research highlights psychological distress, including stress, anxiety, and depression, linked to increasing reliance on artificial intelligence (AI) tools in educational settings (Bukhari et al., 2025).

The psychological constructs, such as imposter syndrome (a psychological pattern in which an individual doubts their skills, talents, or accomplishments and has a persistent internalized fear of being exposed as a "fraud"), have been found to have a strong empirical association with AI dependency, where decreased self-efficacy and self-doubt are empirically linked to psychological distress among students (Ahmad et al., 2026). Although AI can reduce cognitive load, its adoption can also increase academic stress by intensifying pressure to perform, raising moral considerations, and raising validity concerns (Pang et al., 2025). This aligns with stress appraisal, where students use AI both as a helpful tool and as a psychological burden, especially when academic outcomes are mediated by technology.

Educational Challenges and Academic Outcomes

Educational challenges are key to understanding AI adoption in education. In Pakistani universities, the use of AI is growing to address performance-related stress and improve performance and efficiency (Du & Lv, 2024). However, research shows that integrating AI tools may impact cognitive engagement and independent learning (Al-Zahrani, 2024). In Pakistan's competitive academic environment, where a critical exam system and limited institutional resources increase pressure, students become more vulnerable to adopting AI tools (Akhtar et al., 2023).

Academic integrity remains a major concern in educational institutions. There is growing confusion between AI-assisted assignments and plagiarism detection (Khasawneh, 2024). Many students see AI as a helpful tool rather than a form of misconduct, due to limited institutional policies and inconsistent faculty guidance, which further confuses ethical boundaries (Al-Ahmad et al., 2024). If a structured framework does not effectively address AI integration in education, reliance on it could weaken academic standards.

Study habits and time management may also be influenced by AI dependence. Pakistani research on self-regulated learning shows that students who depend on AI tools often have weaker skills in planning, monitoring, and reflection. Self-regulated learning emphasizes the importance of independent mental effort for academic success (Panadero & Broadbent, 2018). When AI replaces human effort instead of supporting these processes, metacognitive abilities tend to diminish (Lim et al., 2023).

EXPLORING THE IMPACT OF AI DEPENDENCY AND PERSONALITY TRAITS ON SOCIAL, PSYCHOLOGICAL, AND EDUCATIONAL CHALLENGES AMONG STUDENTS

Research Gap

While the use of AI in educational settings has become an interesting and challenging concept for students, research on the various impacts of depending on AI remains limited, especially in higher education institutions in Pakistan. Previous studies have shown the benefits of AI in personalized learning, adaptive feedback, and improving academic task efficiency (Nguyen et al., 2024). These studies mainly focus on the impact and effectiveness of the technology and the outcomes, and they are less likely to explore the wider social, psychological, and educational effects of AI use. AI is viewed as a tool that facilitates learning, but excessive reliance on it can also lead to dependence, potentially harming students' social skills, mental health, motivation, and overall learning experience.

Methodological limitations exist in the current literature. Most studies are quantitative, such as collecting data through questionnaires that ask students how often they use AI or providing performance data, but they often lack qualitative data on students' experiences, perceptions, and motivations (Holmes & Tuomi, 2022). Detailed descriptions are not thoroughly explored and are essential for understanding the complex relationship among personality, AI dependence, and student challenges. These approaches can offer a more nuanced, contextually rich perspective that informs culturally responsive policies and practices in higher education.

Theoretical Frameworks

A theoretical foundation is essential for understanding the multidimensional effects of AI dependency on students' social, psychological, and educational outcomes. Combining theories from technology, education, and psychology enables a comprehensive understanding of AI-dependency in higher education.

The I-PACE model (Interaction of Person-Affect-Cognition-Execution) explains the problematic use of technology in its maintenance and development (Brand et al., 2019). According to this model, individual factors, including personality traits such as neuroticism, conscientiousness, and openness, may influence how students respond cognitively and emotionally to AI tools.

Self-determination theory further supports the study by emphasizing the role of intrinsic motivation and psychological needs in learning (Vallerand, 2000). Self-determination comprises independence, autonomy, and relatedness as main concepts that foster engagement, well-being, and performance. AI dependency can undermine these needs if students excessively rely on technology to complete academic tasks and to create personal space, reducing their sense of autonomy and competence.

The Technology Acceptance Model (TAM) further explains the use and adoption of AI technologies (Davis, 1989). TAM theorizes that perceived ease of use is the key factor in technology acceptance. In the educational context, AI adoption is increasing because AI helps simplify academic tasks, solve complex problems, and improve efficiency. Personality traits may influence this perception; for example, students high in neuroticism may use AI to relieve anxiety, while students high in openness may use AI for exploration and enhancement. TAM explains why students adopt AI, how this reliance develops, and the potential social, psychological, and educational challenges that may arise.

Social cognitive theory (SCT) also explains the reciprocal interaction of personal factors, behavior, and environmental influences (Bandura, 2001). Self-efficacy is a key determinant of how AI shapes a student's behavior. Additionally, social norms and observational learning contribute to students'

behavior toward AI. Therefore, social cognitive theory (SCT) provides insights into how personality, social modeling, and individual differences influence AI dependence and its outcomes.

Significance of the Study

As AI becomes more integrated into education, learning, communication, and problem-solving, this study is essential for explaining the social, psychological, and educational challenges students face despite having access to these tools and for investigating AI's constructive role. The study highlights how personality traits influence these effects, demonstrating that AI vulnerability can either exacerbate or mitigate their impact on individuals. The findings will provide valuable insights for teachers, counselors, and policymakers to develop teaching strategies that promote responsible and effective AI use, support emotional health and well-being, and boost academic engagement.

Objectives of the Study

1. To examine the relationship between AI dependence, personality traits, and social, psychological, and educational challenges among college students.
2. To qualitatively examine students' perceptions and lived experiences—both positive and negative—regarding how dependence on AI affects their social interactions, emotional health, and academic performance.
3. To examine whether personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) influence the relationship between AI dependency and students' social, psychological, and educational challenges among university students.

Research Questions

1: What are students' perceptions and lived experiences, both positive and negative, regarding how reliance on AI influences their social interactions, emotional well-being, and academic success?

2: To what extent do personality traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) affect students' AI usage patterns?

Methodology

Research design

A qualitative exploratory design was used to examine the lived experiences of students who were regular users of AI. The aim was to investigate the social, psychological, and educational challenges students face after relying on AI.

Sample of the study

A total of 10 participants who regularly used AI were selected from Multan, Pakistan, to ensure diverse responses. Data collection was halted only after reaching full saturation. The sample size provides a rich, insightful understanding of students' lived experiences.

Table 1 Demographic information of study participant(N=10)

No.	Gender	Degree level	Type of university	Daily AI usage hours	Commonly used AI tools	Purpose of AI use
1	Male	Undergraduate	Public	1-2 hours	Chatgpt	Academic work
2	Female	Postgraduate	Private	2-4hour	Geminiimage AI	Socialinteraction and entertainment

EXPLORING THE IMPACT OF AI DEPENDENCY AND PERSONALITY TRAITS ON SOCIAL, PSYCHOLOGICAL, AND EDUCATIONAL CHALLENGES AMONG STUDENTS

3	Male	Undergraduate	Public	1-2 hours	Chatgpt	Social interaction
4	Female	Postgraduate	Public	1-2 hours	Chatgpt	Academic work
5	Female	Undergraduate	Public	1-2 hours	Chatgpt	Academic work
6	Female	Undergraduate	Public	2-4 hour	Chatgpt	Emotional support
7	Male	Undergraduate	Public	1-2 hours	Chatgpt	Problem solving
8	Female	Postgraduate	Public	1-2 hours	Chatgpt	Academic work
9	Male	Undergraduate	Private	2-4 hour	Gemini	Academic work
10	Female	Postgraduate	Private	2-4 hour	Gemini	Social interaction

Sampling Technique

In this study, purposive sampling was employed to select participants who could provide meaningful and insightful perspectives on the phenomenon under study. Purposive sampling is a nonprobability sampling method in which participants are selected based on specific characteristics and traits that align with the study's requirements.

Inclusion Criteria:

1. Students ages 18 to 26.
2. Enrolled in public or private institutions in Pakistan.
3. Regular users of generative AI tools (e.g., ChatGPT, Grammarly, or similar applications).
4. Willing to participate voluntarily.

Exclusion Criteria:

1. Students who have not interacted with AI tools before.
2. Incomplete responses to the questionnaire.
3. Students who are unwilling to participate in the study.

Study Setting

Data were collected from different higher education institutions (HEIs) in Multan, Pakistan, to ensure diversity and multiple student perspectives.

Data Collection Method

Data were gathered through semi-structured interviews with students enrolled in private and public universities in Multan. We conducted one-on-one interviews, encouraging participants to share their experiences, challenges, and coping strategies openly. Interviews were held either face-to-face or online. Each session lasted about 20–30 minutes and was recorded with the participants' permission. Qualitative data collection continued until thematic saturation was reached.

Data Analysis Procedure

Thematic analysis was used to transcribe interview data. Thematic analysis is employed to identify, analyze, interpret, and report patterns (themes) in qualitative data. First, the raw data, which includes students' perspectives and experiences, was manually coded to identify emerging themes. Step-wise methods of the thematic analysis (Braun & Clarke, 2006) were used to identify codes and themes.

1. **Familiarization with the Data:** The raw data were read and re-read to understand and comprehend the key ideas.
2. **Manual coding of responses:** Transcriptions were manually coded, and similar codes were grouped into categories.

3. Identifying themes: The coded data were organized into broader themes. These themes were described and elaborated to accurately reflect participants' experiences.

4. Verification and interpretation of themes: The themes were interpreted, and findings were verified, and if needed, additional details were pursued to confirm accurate interpretations.

Ethical Considerations

The study followed ethical guidelines outlined in the APA (7th ed.).

- Before collecting data, informed consent was obtained from all participants to ensure anonymity and confidentiality.
- Participation was voluntary, and participants had the right to withdraw at any time.
- Data were used strictly for research purposes.
- No psychological or physical harm was inflicted on the participants.

Findings and discussion

Six key themes and their associated codes emerged from the data, highlighting participants' lived experiences.

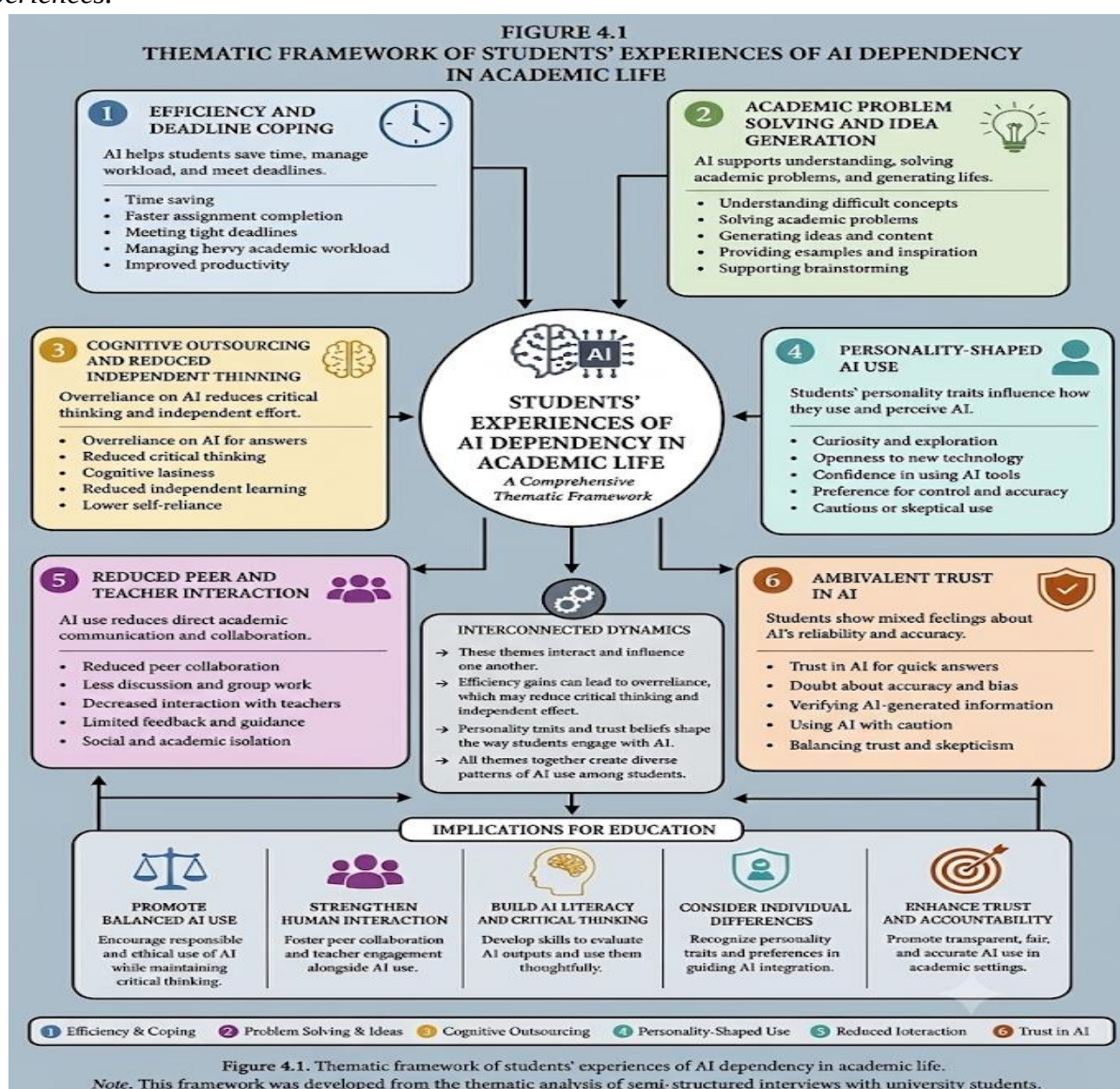


Figure 4.1. Thematic framework of students' experiences of AI dependency in academic life.

Note. This framework was developed from the thematic analysis of semi-structured interviews with university students.

EXPLORING THE IMPACT OF AI DEPENDENCY AND PERSONALITY TRAITS ON SOCIAL, PSYCHOLOGICAL, AND EDUCATIONAL CHALLENGES AMONG STUDENTS

Efficiency and Deadline Coping

The most prominent theme was saving time. Students said that AI is helpful when they have tight deadlines, difficult assignments, or want an instant explanation. The findings suggest that students primarily valued AI for its ability to provide quick assistance when facing multiple academic responsibilities. Some participant responses are given below: "When deadlines are tight, AI helps me." (P3) "Reduce stress, time saving." (P1) "Reduces stress and saves time. Helps me multitask and avoid procrastination." (P5) "Uses AI when deadlines are tight. Helps reduce academic pressure." (P8) However, such efficiency can decrease opportunities for productive struggle in the pursuit of deep learning. If students are given answers as early as possible, they can complete tasks quickly without trial-and-error or independent interpretation. In a phenomenological study, Qayyum (2026) interviewed 32 undergraduate and postgraduate students at three Pakistani universities, using semi-structured narrative interviews, think-aloud writing protocols, and reflective language diaries to gather data. The results showed trends in cognitive offloading, reduced self-confidence in non-assisted activities, and the gradual exclusion of human communication from academic processes. Most importantly, the study embraced the concept of "algorithmic co-authorship" as an understanding of AI—whether used as a tool or as a non-human participant that shapes thoughts and expressions—with direct implications for student relationships with others, including peers and instructors. This Pakistani qualitative study explores the complex and nuanced psychological experiences of students who rely on AI.

Academic Problem Solving and Idea Generation

Students reported extensively using AI to support various academic tasks, including conducting research, generating ideas, summarizing long articles, solving math problems, and improving academic writing. One participant said, "My experience has been very good. I use AI for my entire workload, including digital marketing and content writing. It has helped me with both academic and personal growth in writing. The AI is reliable and trustworthy. If I give a good prompt, it gives good results. The information is detailed and correct." Participants see AI as an accessible learning resource that makes understanding complex topics easier and helps complete academic work more efficiently. "I use it for researching topics." (P2) "My experience has been positive. AI helps me move from basic to complex solutions. It is very helpful for assignments and presentations. It has also helped me gain confidence." (P6) "AI summarizes a super long article." (P7) "Professionally, I do not share personal information with AI. Grammarly and chatbots have become my study buddies. I often get new ideas and help with tough concepts from them." (P3) "I use AI tools to get ideas, but I am not totally dependent on them. Overall, I have a healthy relationship with AI. It has never disappointed me." (P5) However, this theme turned out to be a positive experience for participants using AI tools.

To explore the use of AI as a cognitive intermediary in higher education in Pakistan, Zaib (2026) conducted a study using Cognitive Load Theory, surveying 385 undergraduate and postgraduate students. The results showed a significant reduction in extraneous load (Mean=4.41), with over 90% of students agreeing that AI is an effective tool for managing complex grammatical and mechanical tasks in writing; a notable decrease in intrinsic load (Mean=4.26), as 89% of students reported that it is considerably less stressful to complete complex writing tasks with AI support; and a high level of

pragmatic confidence (87% positive response rate). The study also revealed a fundamental shift in student identity from "language-struggler" to "content-creator," raising questions about whether this change reflects skill growth or reliance on algorithms.

Cognitive Outsourcing and Reduced Independent Thinking

Another important qualitative theme was cognitive outsourcing. One concern participants often raised was the fear that AI would eliminate their ability to think, making students lazy and passive learners. The theme fully addresses the issues discussed in recent literature on cognitive offloading and skill substitution. The interviews show that students are aware of this risk. Factors such as time pressure, convenience, and academic expectations influence their use of AI, with many acknowledging the risks but continuing to use it. This ambivalence is significant because it emphasizes the need for responsible AI education to warn students about potential misuse. It should help them learn to use AI effectively while maintaining their independence of thought. I worry it causes me to think less deeply.

Yes, it eliminates the need to think when necessary. It completely reduces thinking capacity, but attempts to balance AI and personal mental effort. It assists with problem-solving and generating ideas, but feels almost dependent. Thinking capacity is diminished. Thinking power has decreased due to the use of AI.

Personality-Shaped AI Use

Participants indicated that individual personality traits influence how and why they use AI. Students experiencing anxiety, introversion, organizational difficulties, or deadline stress reported relying more on AI because it offers immediate, non-judgmental help. However, some participants also showed cautious use, verifying AI responses before submitting their work, suggesting that trust in AI varies by personal preferences and confidence levels. Yes, I am an introvert. AI is flexible; I can ask AI multiple times, which isn't possible with humans. (P1). Sympathetic, agrees with others. But conscientiousness prevents me from fully relying on AI. I always recheck. I used to double-check my work before submitting. Students who regularly use AI tools for academic tasks are less engaged in the classroom and with peers. This phenomenon is especially common among introverts and neurotics, who may prefer interacting with AI rather than fellow humans. Conversely, students high in extraversion and openness are more likely to use AI for collaborative learning, including discussions and knowledge-sharing (Holmes et al., 2022).

Reduced Peer and Teacher Interaction

Students reported that AI is faster than humans, available around the clock, and more objective. The benefits of AI are significant, especially for students who are shy, anxious, or feel unsupported. However, relying on AI rather than human effort could lead to a decline in social confidence and communication skills. Group work, presentations, and classroom participation are often emphasized by universities because they help students prepare for their future careers. Therefore, social connectedness remains essential and should not be overlooked in AI education research. I have chosen AI assistance over peers.

Ambivalent Trust in AI

Some ambivalent trust was also expressed during the interviews. Some students reported using AI as a reliable and trustworthy source, but others said they don't believe it's 100% accurate and that they still need to review answers. This finding highlights the importance of AI literacy education, helping

EXPLORING THE IMPACT OF AI DEPENDENCY AND PERSONALITY TRAITS ON SOCIAL, PSYCHOLOGICAL, AND EDUCATIONAL CHALLENGES AMONG STUDENTS

students learn to prompt responsibly, cross-check information, reference sources, avoid plagiarism, and recognize limitations. Looking at the bigger picture, it appears that university students' use of AI is a double-edged sword. It offers accessibility, speed, personalization, and emotional relief, but it can also lead to social withdrawal, educational stress, and a decline in independent thinking. Sometimes, fake responses increase my stress. AI's warm responses encourage me a lot, but I mostly feel guilty that it is not my own work. (P5) I enjoy and feel comfortable with instant feedback. It makes me feel relieved, but I feel uneasy if I become over-reliant on it. Use AI confidently, but feel anxious or guilty afterward because I thought it would be better to answer independently. The experience is good overall, but it can get frustrating because the AI always agrees with me. It doesn't provide critical feedback.

Tahir, Kanwal, and Bibi (2025) used a qualitative phenomenological approach with 30 Pakistani learners (1-8 semesters), focusing on structured interviews to explore their real-life experiences using ChatGPT for assignment writing. The study identified two new themes: Frustration and Excitement. Results showed that ChatGPT produced both positive (confidence boost, better writing skills) and negative (irrelevant responses, lack of confidence, dependency) feedback. This mixed emotional response to relying on AI may explain why there are inconsistent, non-significant findings regarding correlations with self-esteem measures, as the positive and negative feelings might cancel each other out. The effects of AI dependency on education have been explored in Pakistan through qualitative research.

Table 2

Overall summary of themes extracted from interview responses.

Theme	Interpretation	Explanatory Evidence	Interview
Efficiency and deadline coping	Students frequently stated that AI was useful for time saving, reducing stress, and completing assignments under deadline pressure.	"When deadlines are tight, AI helps me." / "Reduce stress, time saving."	
Academic problem solving and idea generation	AI was commonly used for research, writing assistance, summarizing long articles, solving mathematical problems, and problem-solving.	"I use it for researching topics." / "AI summarizes a super long article."	
Cognitive outsourcing and reduced independent thinking	Many students support the notion that AI supports learning, but can also reduce critical thinking, increase laziness, and create lazy learning habits.	"I worry it makes me lazy in thinking deeply." / "Thinking power less."	
Personality-shaped AI use	Anxiety, introversion, organization, deadline pressure, and trust issues shaped whether students relied on AI, double-checked it, or used it as a safer alternative to people.	"I am an introvert, and AI is flexible." / "I used to double-check before submission."	
Reduced peer and teacher interaction	Several participants stated that they chose AI instead of peers or teachers because it was faster, always available, and less socially	"I have chosen AI help over peers." / "AI gives me proper answers in no time."	

demanding.

Ambivalent trust in AI Students appreciated immediate help but also "Not trustworthy." /
worried about fake or untrustworthy responses, "Sometimes my stress
showing that AI use was not fully accepted. increases due to fake
responses."

Note. Interview evidence was anonymized and lightly edited for clarity while retaining the participants' original meaning.

Conclusion

The final judgment is that reliance on AI should be part of a balanced approach to education, not a total ban. AI has become an integral part of students' lives, and banning it entirely could be difficult. However, overuse may reduce social learning, independent thinking, and academic confidence. The common ground is responsible, critical, and ethical use of AI rather than replacing human interaction and cognition, which should be prioritized first.

Recommendation

Stakeholder	Recommendation
Students	Students should use AI as a learning assistant, not as a replacement for personal efforts. Assistance includes getting ideas and a framework, but the final work should be written in one's own words.
Teachers	Design assignments that require process evidence, reflection, classroom discussion, oral explanation, and application to local contexts. This reduces passive copying and encourages deeper learning.
Universities	Develop clear AI-use policies that define acceptable assistance, citation expectations, prohibited practices, and consequences of misuse. Policies should be educational rather than only punitive.
Counselors	Screen for excessive reliance on AI as a possible indicator of academic stress, avoidance coping, low confidence, or social isolation. Provide support for time management, study skills, and anxiety reduction.
Curriculum designers	Integrate AI literacy into study skills and research methods courses. Students should learn prompting, verification, bias recognition, privacy protection, and ethical citation.
Policy makers	Support responsible AI frameworks for Pakistani higher education, including teacher training, student guidance, data privacy standards, and equitable access to digital resources.
Future researchers	Use longitudinal and experimental designs to clarify whether AI dependency causes stress and social disconnection or whether stressed and isolated students become more dependent on AI.

Limitations and future research directions

Students may interpret AI use differently, leading to underreporting or overreporting depending on their definitions and understandings of dependency and academic integrity. The results of this study might not be applicable to school students, working adults, or students from countries with different educational cultures or AI policies. AI dependence is a relatively new area of research. Emerging

EXPLORING THE IMPACT OF AI DEPENDENCY AND PERSONALITY TRAITS ON SOCIAL, PSYCHOLOGICAL, AND EDUCATIONAL CHALLENGES AMONG STUDENTS

capabilities include emotion-engaging, multimodal AI use, agentic AI systems, and AI-assisted social communication, which could become additional components of a future measurement scale. Long-term studies are recommended to determine whether reliance on AI increases over time and if AI predicts changes in academic stress, self-esteem, social connectedness, and performance later in life. Students who use AI to explain concepts, generate answers, or adhere to traditional study methods can be compared in experimental research. This can help identify which AI systems support learning and which do not. Additional research should explore psychological factors such as perfectionism, emotional regulation, fear of failure, procrastination, perceptions of loneliness, and academic self-efficacy. Future studies in Pakistan should include students from multiple provinces, both public and private universities, and urban and rural areas to enhance generalizability and better understand the cultural context.



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

References

1. Abdullah, M. R., Muhamad, F. N., Abdullah, Z. H., Amonov, B., & Yaakob, M. A. (2025). Exploring the mediating effect of academic self-efficacy on metacognitive awareness and students' academic writing skill in Islamic higher education. *Journal of Instruction and Islamic Religious Education*, 1(2), 135-152. <https://doi.org/10.63826/jiire.v1i2.175>
2. Ahmad, Z., Soroya, M. S., & Awais, A. (2026). Understanding Academic Integrity Beliefs, Motivations and Behaviors Amongst Postgraduate Students: a Comparative Analysis of Public and Private Sector Universities in Punjab, Pakistan. *Journal of Academic Ethics*, 24(1), 1-22. <https://doi.org/10.1007/s10805-025-09697-x>
3. Akhtar, S., Nadeem, M., Rashdan, M., Hussain, B., Ansari, E. A., & Aslam, M. H. (2023). Online mode of teaching and learning process in engineering discipline: teacher perspective on challenges faced and recommendations. *Education Sciences*, 13(2), 200. <https://doi.org/10.3390/educsci13020200>
4. Al-Ahmad, A., Kahtan, H., Tahat, L., & Tahat, T. (2024). Enhancing software engineering with
5. AI: Key insights from ChatGPT. 2024 International Conference on Decision Aid Sciences and Applications (DASA), <https://doi.org/10.1109/DASA63652.2024.10836262>
6. Al-Zahrani, A. M. (2024). The impact of generative AI tools on researchers and research:
7. Implications for academia in higher education. *Innovations in Education and Teaching International*, 61(5), 1029-1043. <https://doi.org/10.1080/14703297.2023.2271445>
8. Bewersdorff, A., Seßler, K., Baur, A., Kasneci, E., & Nerdel, C. (2023). Assessing student errors in experimentation using artificial intelligence and large language models: A comparative study with human raters. *Computers and Education: Artificial Intelligence*, 5, 100177. <https://doi.org/10.1016/j.caeai.2023.100177>
9. Brand, M., Laier, C., & Young, K. S. (2014). Internet addiction: coping styles, expectancies, and treatment implications. *Frontiers in psychology*, 5, 1256. <http://doi.org/10.3389/fpsyg.2014.01256>
10. Bukhari, S. R., Batool, S., Shahab, I., Jalil, R., Arshad, A., Zahra, S. Q.,...Khan, N. (2025). Role of AI dependency in psychological distress and academic performance among university students. *International Journal of Social Sciences Bulletin*, 3(3), 286-294. <https://doi.org/10.5281/zenodo.14998025>
11. Du, L., & Lv, B. (2024). Factors influencing students' acceptance and use of generative artificial intelligence in elementary education: An expansion of the UTAUT model. *Education and Information Technologies*, 29(18), 24715-24734. <https://doi.org/10.1007/s10639-024-12835-4>
12. Elhai, J. D., Gallinari, E. F., Rozgonjuk, D., & Yang, H. (2020). Depression, anxiety and fear of missing out as correlates of social, non-social and problematic smartphone use. *Addictive behaviors*, 105, 106335. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
13. Heffer, T., Good, M., Daly, O., MacDonell, E., & Willoughby, T. (2019). The longitudinal association between social-media use and depressive symptoms among adolescents and young adults: An empirical reply to Twenge et al.(2018). *Clinical Psychological Science*, 7(3), 462-470. <https://doi.org/10.1177/2167702618812727>
14. Huang, J., Yang, D. M., Rong, R., Nezafati, K., Treager, C., Chi, Z.,...Klesse, L. J. (2024). A critical assessment of using ChatGPT for extracting structured data from clinical notes. *NPJ digital medicine*, 7(1), 106. <https://doi.org/10.1038/s41746-024-01079-8>

15. Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F.,...Hüllermeier, E. (2023). *ChatGPT for good? On opportunities and challenges of large language models for education*. *Learning and individual differences*, 103, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
16. Kasneci, G., & Kasneci, E. (2026). *The safety failures we are not instrumenting: a perspective on hidden safety-critical challenges in modern AI systems*. *AI and Ethics*, 6(3), 295. <https://doi.org/10.1007/s43681-026-01132-0>
17. Khasawneh, M. (2024). *Academic integrity and the use of ChatGPT by EFL pre-service teachers*. *Journal of Infrastructure, Policy and Development*, 8(7), 4783. <https://doi.org/10.24294/jipd.v8i7.4783>
18. Lim, J., Shin, Y., Song, M. H., Lee, S., & Ihm, J. (2026). *Self-study in higher education: Its role in productive discussions and learning outcomes*. *Active Learning in Higher Education*, 27(1), 27-42. <https://doi.org/10.1177/14697874241270429>
19. Marengo, D., Sindermann, C., Häckel, D., Settanni, M., Elhai, J. D., & Montag, C. (2020). *The association between the Big Five personality traits and smartphone use disorder: A meta-analysis*. *Journal of Behavioral Addictions*, 9(3), 534-550. <https://doi.org/10.1556/2006.2020.00069>
20. McCrae, R. R., & Costa, P. T. (2008). *Empirical and theoretical status of the five-factor model of personality traits*. *The SAGE handbook of personality theory and assessment*, 1, 273-294. <https://doi.org/10.1521/pedi.1992.6.4.343>
21. Panadero, E., & Broadbent, J. (2018). *Developing evaluative judgement: A self-regulated learning perspective*. In *Developing evaluative judgement in higher education* (pp. 81-89). Routledge.
22. Pang, H., Jin, X., & Zhang, W. (2025). *Deciphering the underlying repercussions of cognitive overload on university students' fatigue, frustration and academic productivity: Implementation of stimulus–organism–response model*. *Acta Psychologica*, 260, 105469. <https://doi.org/10.1016/j.actpsy.2025.105469>
23. Shin, M., & Moon, M. *Cohort Differences in Mobile Phone Dependency: Mediation of Peer*
24. *Play and Gender Moderation*. <http://dx.doi.org/10.13106/jsas.2025.Vol9.no4.165>.