

RESEARCH ARTICLE

Beyond academic use: Emotional reliance, social withdrawal, and anxiety in university students' narratives of ChatGPT

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Abstract

Background: Conversational artificial intelligence (AI) tools such as ChatGPT are increasingly integrated into university students' academic routines. In addition to supporting coursework, some students report using these systems for emotional reassurance and stress management. Although emerging research has examined associations between AI use and psychological outcomes, qualitative evidence exploring how students narrate these experiences in everyday contexts remains limited.

Objective: To examine how university students describe emotional, social, and academic experiences related to ChatGPT use, with particular attention to perceived emotional reliance, anxiety-related experiences, and changes in peer engagement.

Methods: A qualitative descriptive design using inductive codebook thematic analysis was applied to publicly accessible Reddit posts from student- and mental health-related communities (e.g., r/college, r/GradSchool, r/Anxiety) published between January 2023 and October 2025. Eighty-three posts meeting predefined inclusion criteria were analyzed. Two researchers independently coded a subset of posts and achieved substantial intercoder agreement (Cohen's $\kappa = 0.81$; 88% agreement). All excerpts presented in the manuscript were paraphrased to reduce traceability and protect anonymity.

Results: Six synthesized themes were identified: (i) emotional reliance and reassurance-seeking, (ii) social withdrawal and reduced peer engagement, (iii) anxiety amplification and cognitive overload, (iv) academic integrity-related pressure and performance anxiety, (v) reduced intrinsic motivation and creative disengagement, and (vi) trust, privacy, and emotional vulnerability concerns. Cross-cutting patterns described by students included reassurance-seeking cycles, co-occurring anxiety and withdrawal, perceived short-term emotional relief accompanied by longer-term costs, and substitution of peer interaction with AI-mediated support.

Conclusion: Student narratives suggest that ChatGPT may function both as an academic aid and as an external coping resource, with experiences shaped by individual and contextual factors. When AI-mediated reassurance appears to substitute for interpersonal support, students describe heightened anxiety and reduced social engagement. These findings highlight the importance of digital well-being initiatives, clearer institutional guidance, and AI literacy programs that promote reflective and balanced use of conversational AI in higher education.

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1. Introduction

Conversational artificial intelligence (AI) systems, such as ChatGPT, have become increasingly integrated into the academic routines of university students. Initially adopted for information retrieval, drafting assistance, and problem-solving support, conversational AI tools are now commonly used in everyday study activities. Beyond academic tasks, recent studies indicate that some students also use these systems for emotional reassurance, stress management, and guidance during periods of uncertainty.¹⁻⁴

Digital technologies were used as tools for emotional coping. Research on prevalent problematic internet use indicates that individuals often turn to online environments to manage their emotions, unwind, or escape from perceived interpersonal challenges. Caplan's model² emphasizes the role of mood regulation and a tendency toward online interaction in influencing patterns of technology dependence.⁵ Compensatory internet use theory posits that instead of technology being the primary source of distress, excessive or emotionally driven engagement with technology often serves as a means to cope with existing stressors. These theoretical perspectives provide a valuable foundation for understanding how conversational AI could function as an external tool for emotional regulation within educational environments.

The theory of emotion regulation offers further insight into this process. To address anxiety, uncertainty, and self-doubt, individuals frequently seek external methods and resources.⁶ Digital systems can be incorporated into personal coping strategies when they provide immediate responses, affirmation, and unbiased feedback. In specific circumstances, a continual dependence on external validation has been associated with heightened rumination and greater challenges in managing uncertainty, even though these interactions can provide temporary comfort.^{7,8}

Research on digital communication and loneliness indicates that, depending on how they are used, online interactions can either facilitate reconnection or supplant in-person interactions.⁹ Longitudinal studies suggest that loneliness may serve as an indicator of reduced social and behavioral engagement over time.¹⁰ When considered collectively, these findings indicate that the psychological impacts of digital platforms often vary based on context, rather than being uniformly positive or negative.

The increasing integration of digital technologies in higher education intersects with ongoing concerns regarding student motivation, the pressure to perform, and the integrity of academic work. Research on academic integrity highlights the psychological strain induced by high-stakes assessment environments, as well as the effects of mistrust and monitoring.^{11,12} However, self-determination theory posits that perceptions of relatedness, competence, and autonomy significantly impact intrinsic motivation.¹³ Students might participate in self-comparison processes that influence their perception of competence and creative agency, particularly when AI-generated outputs appear exceptionally effective or refined.

Recent research on the application of generative AI in educational environments has identified connections between regular interactions with chatbots and various experiences, including anxiety, the pursuit of reassurance, alterations in study habits, and feelings of academic self-doubt.¹⁴⁻²⁰ However, a significant part of this research remains in its preliminary phases. While quantitative research often uncovers statistical correlations, it provides a limited understanding of how students perceive and describe these experiences within their everyday academic lives.

Qualitative approaches offer an additional perspective by examining how students describe their interactions with conversational AI in emotional, social, and academic contexts.²¹⁻²⁴ Rather than assuming universal benefits or harms, qualitative research allows exploration of perceived dependence, experienced trade-offs, and contextual patterns of use as expressed in students' own narratives.

This study, therefore, examines publicly accessible student narratives describing ChatGPT use, with particular attention to perceived emotional reliance, anxiety-related experiences, and changes in peer interaction. The aim is not to estimate prevalence or establish causal relationships, but to identify recurring patterns within these narratives and situate them within established frameworks of compensatory technology use,²⁵⁻²⁹ emotion regulation,³⁰ loneliness and digital interaction,³¹ academic integrity,³² and motivation theory.³³ By situating the analysis within these conceptual domains and engaging with emerging research on generative AI,³²⁻³⁵ this study provides a theoretically informed qualitative perspective on students' experiences with conversational AI in contemporary higher education.

2. Methods

2.1. Study design

This study employed a qualitative descriptive design using inductive codebook thematic analysis, a structured analytic approach aligned with qualitative content analysis. The aim was to identify patterned meanings across student-authored narratives describing perceived emotional, social, and academic experiences associated with ChatGPT use. The analysis was descriptive and interpretive, focusing on recurrent patterns across accounts rather than generating formal theory or establishing causal relationships.

The codebook-based team coding procedure emphasizes clearly defined operational criteria, systematic coding procedures, and assessment of intercoder consistency. The study did not adopt reflexive thematic analysis; instead, it followed a structured codebook framework suitable for reliability assessment.

2.2. Data source and search strategy

Data were drawn from publicly accessible Reddit posts. Reddit was selected because it hosts topic-specific communities in which university students frequently discuss academic experiences, emotional well-being, and technology use under pseudonymous conditions.

Posts published between January 2023 and October 2025 were eligible for inclusion. Manual searches were conducted during 2025 using Reddit's internal search function. Searches were performed within pre-identified subreddits relevant to student life, academic contexts, and mental health, including but not limited to: r/college, r/GradSchool, r/medicalschoo, r/StudentNurse, r/AskAcademia, r/Anxiety, r/Depression, r/study, and r/socialanxiety. A structured set of keywords and Boolean combinations guided the search process:

- (i) "ChatGPT" AND "student"
- (ii) "ChatGPT" AND "loneliness"
- (iii) "ChatGPT" AND "anxiety"
- (iv) "ChatGPT" AND "mental health"
- (v) "ChatGPT" AND "study group"
- (vi) "ChatGPT reliance" OR "ChatGPT dependence"
- (vii) "using ChatGPT to cope"

Posts were sorted by relevance and recency during screening. Duplicate entries identified across search combinations were removed. A detailed description of the search and screening workflow is provided in [Appendix A](#).

2.3. Inclusion and exclusion criteria

Posts were eligible for inclusion if they met *all* of the following criteria:

- (i) The author self-identified as a university student (e.g., undergraduate, graduate, medical student).
- (ii) The post explicitly mentioned ChatGPT's use in academic, emotional, or interactional contexts.
- (iii) The narrative described perceived emotional, social, or behavioral experiences associated with ChatGPT use.
- (iv) The post was written in English.
- (v) The content was publicly accessible without access restrictions.

Posts were excluded if they:

- (i) Lacked a personal narrative (e.g., purely technical discussions).
- (ii) Were authored by individuals not identifying as students.
- (iii) Consisted primarily of memes, advertisements, or suspected automated content.
- (iv) Were duplicate or incomplete entries.

A total of 217 posts were screened, of which 83 met the inclusion criteria and were retained for analysis.

2.4. Data extraction and ethical considerations

Eligible posts were exported into an encrypted spreadsheet containing subreddit name, posting date, de-identified narrative text, self-reported student status, and analytic notes. Usernames, URLs, timestamps, and other direct identifiers were removed at the time of extraction.

Given that verbatim online quotations can be searchable and enable reverse identification through search engines, all excerpts presented in this manuscript are anonymized paraphrases rather than direct quotations. Paraphrasing was used to preserve analytic meaning while minimizing traceability risk. Posts from small or highly sensitive communities were excluded to further reduce re-identification risk.

Data were stored in an encrypted environment accessible only to the research team. The study was reviewed and approved by the Research Ethics Committee, University of Ha'il (Approval No. H-2024-014).

2.5. Data analysis

Data were analyzed using inductive codebook thematic analysis. Two researchers independently conducted initial open coding on a subset of posts to identify preliminary patterns related to emotional reliance, social interaction, anxiety experiences, academic integrity concerns, motivational shifts, and privacy perceptions. Through iterative comparison and discussion, these preliminary codes were consolidated into a structured codebook containing clearly defined operational definitions and

coding boundaries.

The finalized codebook was then systematically applied across the full dataset to identify recurrent patterns and organize them into six overarching themes and associated sub-codes. The complete thematic codebook is presented in [Appendix B](#).

Analytic memos were maintained throughout the coding process to document coding decisions and category refinement. These memos supported procedural transparency within the structured coding framework ([Appendix C](#)).

Reflexive memoing and peer debriefing were conducted throughout the analysis to enhance transparency and minimize interpretive bias within the structured codebook approach ([Appendix D](#)).

All coding and data management were conducted manually using Microsoft Excel in an encrypted environment. No qualitative analysis software, automated text-mining systems, or generative AI tools were used in coding, theme development, interpretation, or manuscript preparation.

2.6. Intercode agreement

To assess analytic consistency within the structured codebook approach, a subset of 20 posts (24% of the dataset) was independently coded by both researchers using the finalized codebook.

Intercode agreement was evaluated using Cohen's kappa and percentage agreement. The analysis yielded a Cohen's κ of 0.81 (95% confidence interval: 0.76–0.86) and an overall agreement rate of 88%, indicating substantial agreement.

Discrepancies were discussed and resolved through consensus, and minor refinements were made to clarify code definitions before applying the revised codebook to the remaining dataset.

2.7. Saturation and sample adequacy

Sampling and analysis proceeded iteratively. Posts were reviewed in waves of approximately 10 entries, and the emergence of new codes was monitored across waves. By the seventh wave, no substantially new codes were identified, indicating relative code saturation. An additional confirmatory wave was conducted to ensure adequate elaboration of existing categories.

The final sample of 83 posts was considered sufficient to achieve analytic depth consistent with the descriptive aims of the study. A procedural overview of the analytic workflow is provided in [Appendix E](#).

2.8. Rigor and reporting standards

Reporting followed the Consolidated Criteria for Reporting Qualitative Research guidelines. Credibility was supported through iterative coding, team-based analysis, and structured assessment of intercode agreement. Dependability was strengthened through the maintenance of a documented audit trail. Confirmability was enhanced through reflexive documentation and peer debriefing. Transferability was supported through detailed reporting of data sources, sampling strategy, and analytic procedures.

3. Results

Through inductive codebook thematic analysis of 83 Reddit posts produced by self-identified university students, six synthesized themes were identified. Collectively, these themes delineate how students describe their interaction with ChatGPT in academic, emotional, and social contexts, along with the perceived psychological and behavioral ramifications linked to prolonged dependence.

A limited number of entries presented divergent perspectives, wherein students characterized ChatGPT as a transient or ancillary resource that facilitated studying, assisted in planning discussions with classmates or counselors, or alleviated anxiety without supplanting offline interactions. These anomalous occurrences were preserved throughout analysis and utilized to enhance code definitions and theme delineations, hence preventing overgeneralization.

Students consistently reported a discernible trend in which initial academic or utilitarian usage evolved into an emotional reliance, followed by alterations in social interactions and experiences connected to anxiety. This pattern signifies a conceptual amalgamation of narratives, rather than a continuous trajectory seen in individual students.

3.1. Emotional reliance and reassurance-seeking

A recurrent pattern in student narratives was the progressive establishment of emotional reliance on ChatGPT as a consistent and easily available source of comfort, validation, and friendship. Students frequently articulated how initial encounters for academic clarity or efficiency evolved into emotionally charged exchanges that became integrated into their daily routines. This transition was frequently characterized as gradual and inadvertent, arising from habitual usage rather than a conscious choice to pursue emotional support.

ChatGPT was often characterized as reliably accessible, predictable, and impartial—attributes that students compared to the perceived emotional risks, efforts, or

unpredictability associated with human connection. For many individuals, these traits made AI-mediated engagement especially attractive during periods of stress, self-doubt, or loneliness.

One student stated, “I used to just use ChatGPT for assignments or quick answers, but over time, it became the place I went whenever I felt overwhelmed or unsure. I did not even notice when that change happened,” while another stated, “I talk to it about my stress, my feelings, even small things that happened during the day. It feels like a silent friend that is always there and never judges me.”

Several students reflected on how reassurance-seeking shifted from situational use to a more habitual pattern, with ChatGPT becoming a default emotional regulator rather than a supplementary resource: “I started checking in with ChatGPT the same way I used to talk to a close friend. When I do not open it, I feel unsettled, like something is missing,” and “It became part of my daily routine. I do not wait until I am really stressed anymore—I just go there automatically.”

These narratives indicate that emotional reliance often develops gradually, with students acknowledging the depth of their connection only after reassurance-seeking has transitioned from necessity to routine practice.

3.2. Social withdrawal and displacement of peer interaction

Numerous students reported less interaction with classmates and collaborative learning environments, frequently coinciding with heightened dependence on ChatGPT. Students exhibiting social anxiety or fear of negative assessment frequently reported evasion of group study sessions, classroom discussions, and casual social interactions.

ChatGPT was frequently promoted as a safer and more manageable substitute for face-to-face communication. In contrast to peers, it required neither explanation, negotiation, nor emotional reciprocity, hence reducing the immediate emotional burden associated with asking for assistance. One student stated, “In the beginning, I told myself I just did not want to bother people, so I asked ChatGPT instead. But after a while, I started avoiding my classmates completely,” while another stated “It is easier to ask AI than to explain myself to people.”

Some students reflected on this shift retrospectively, describing a gradual narrowing of social engagement rather than a conscious decision to withdraw: “I did not notice it at first, but I slowly stopped going to study groups and replying to messages. It was not intentional—it just felt easier to stay in my own space with ChatGPT.”

Those narratives indicate a perceived displacement of peer contact, wherein dependence on AI-mediated assistance correlates with heightened social retreat and diminished prospects for reciprocal learning and relationship development.

3.3. Anxiety amplification and cognitive overload

While some students initially turned to ChatGPT to manage anxiety or uncertainty, many narratives described experiences in which repeated reassurance-seeking intensified rather than alleviated distress. Students reported cycles of compulsive questioning, rumination, and difficulty disengaging from the platform, particularly during periods of academic pressure or emotional ambiguity.

Rather than producing clarity or closure, interactions with ChatGPT were often described as generating additional questions and reinforcing doubt: “I kept asking the same questions in different ways, hoping it would finally calm me down, but it just made me think more,” and “I refresh the chat again and again, waiting for something different, even though I know it would not change.”

Several students linked these patterns to mental exhaustion and disrupted sleep, describing extended late-night interactions that left them cognitively overwhelmed. One student stated, “Instead of helping me relax, it kept my mind spinning. I had to stay awake all night, going back and forth with it.” Another noted, “It turned into a loop—ask, feel better for a second, then feel worse and ask again.”

These narratives illustrate how reassurance-seeking interactions may become self-reinforcing, contributing to heightened anxiety, cognitive fatigue, and difficulty disengaging.

3.4. Academic integrity pressure and performance anxiety

Students often reported increased worry around academic integrity and perceived AI monitoring, even in instances where ChatGPT was not utilized. The ambiguity around permissible AI usage, along with apprehension of misunderstanding or wrongful attribution, led to ongoing self-scrutiny and stress connected to performance. One student stated, “When I compared my work to what ChatGPT generated in seconds, my motivation dropped. I stopped experimenting and just felt like my effort did not matter anymore.” Another student stated, “It was not just about grades—it felt like what I could produce as a person was not valued when the system could do it faster and better.”

This theme highlights how institutional ambiguity

surrounding AI use may undermine academic confidence, discourage participation, and amplify anxiety beyond the act of tool use itself.

3.5. Reduced intrinsic motivation and creative disengagement

Multiple narratives indicated a deterioration in intrinsic drive, creative confidence, and personal involvement after sustained exposure to ChatGPT's swift and refined outputs. Students indicated a withdrawal from writing, artistic expression, and autonomous problem-solving, frequently ascribing this change to negative self-comparison and reduced self-efficacy: "Once I saw how easily it could write something better than me, I just stopped trying," and "It made me feel replaceable."

Rather than direct academic failure, this theme reflects concerns about the erosion of agency and personal investment in learning and creative processes.

3.6. Trust, privacy, and emotional vulnerability

A concluding theme addressed ongoing apprehension about privacy, data retention, and monitoring, especially after instances of emotional revelation. Students often

reported expressing personal ideas spontaneously during periods of difficulty, subsequently experiencing concern around the potential location of that material and who could have access to it. One student stated, "After opening up to ChatGPT, I started worrying about where those thoughts go. The relief fades, and I am left feeling uneasy about who might have access to what I shared," while another stated, "I know it is not a person, but there is a lingering sense of being observed. That feeling does not happen while I am typing—it comes afterward."

These concerns engendered emotional ambivalence, converting originally perceived support into an added source of vulnerability and discomfort.

The interrelationships among the six synthesized themes are visually summarized in Figure 1. The thematic map illustrates how these patterns co-occurred across student narratives without implying a linear or causal pathway.

Nodes represent the six synthesized themes identified through inductive codebook thematic analysis. The map illustrates conceptual relationships among themes as described across narratives. The figure does not imply causality or temporal sequence.

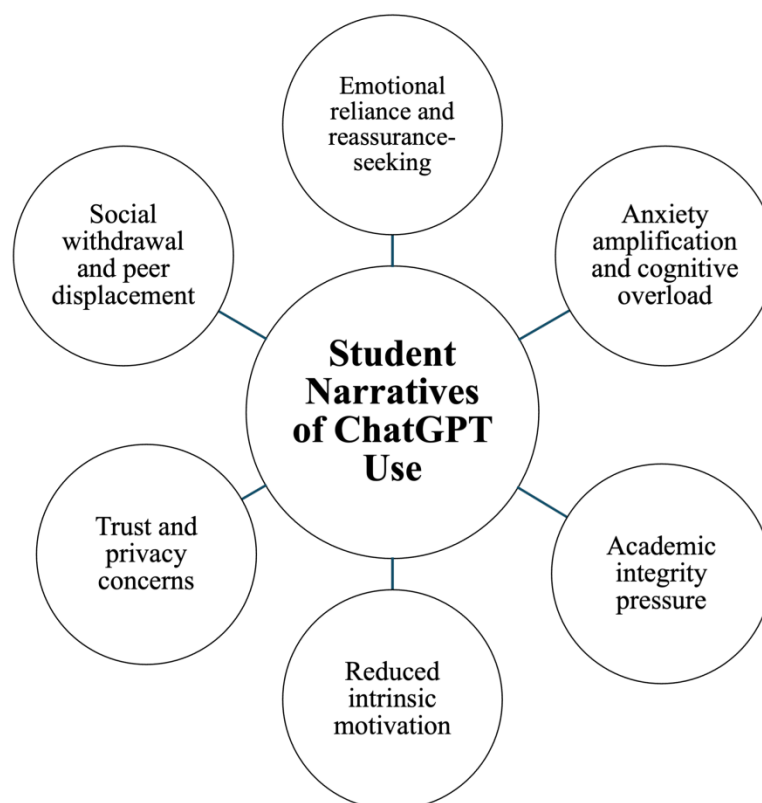


Figure 1. Conceptual thematic map of co-occurring patterns in student narratives of ChatGPT use

4. Discussion

This study examined how university students express their emotional, social, and academic experiences related to the use of ChatGPT, with particular emphasis on emotional dependency, anxiety, and changes in peer interactions. Rather than demonstrating that the use of ChatGPT is inherently detrimental, the findings illustrate how students discuss various ways of utilizing the tool. Initially perceived as beneficial or supportive, this reliance can gradually foster emotional reliance, increase anxiety, and diminish social interactions over time. These patterns hold significance as they reveal students' perspectives and experiences, rather than illustrating causation or development.

The findings align with contemporary research on affective engagement with conversational AI, suggesting that emotionally responsive systems may modify users' distress regulation and help-seeking behaviors. Previous studies suggest that repeated emotionally focused interactions with chatbots may affect coping strategies and mood regulation, particularly when users perceive the conversation as supportive and non-judgmental.²⁷⁻²⁹ In this study, students expressed that they turned to ChatGPT during periods of stress or uncertainty, frequently characterizing it as an emotionally "safe" environment. At the same time, these narratives frequently highlighted the shortcomings of this type of assistance, particularly its failure to incorporate the mutual exchange of support or to grasp the contextual nuances that characterize human interactions.

Several studies suggest that the intensity with which people rely on chatbots may depend less on the technology itself and more on their emotional needs and the situation they are in.³⁶ This is in line with research on emotional reliance and technology-mediated support. Studies have shown that students who are lonely, anxious, or overwhelmed with schoolwork may be more likely to seek AI-mediated reassurance. This can make it seem like reliance comes before distress when, in fact, vulnerability may come first.³⁰⁻³³ This interpretation is supported by findings in the current study, where students often described ChatGPT as a means of coping during heightened stress, rather than as a primary source of anxiety.

A notable finding was the shift in peer interactions and evolving approaches to learning. Many students reported substituting group study, peer discussions, or consultations with instructors for ChatGPT, particularly when they found interpersonal interactions to be burdensome or anxiety-provoking. Prior research has suggested that an overreliance on AI tools might be linked to a reduction in collaborative learning and a diminished sense of belonging within academic settings, especially when AI

acts as a replacement for, rather than a complement to, social learning experiences.³⁵⁻³⁷ Other studies, on the other hand, have shown that generative AI can also help people learn when it is used in collaborative or scaffolded learning environments. These findings suggest that the incorporation of AI tools into students' academic practices has a substantial impact on their outcomes.³⁸⁻⁴⁰

Anxiety was a common theme in each narrative, especially when it came to cycles of needing reassurance and pressures to be ethical in school. Previous research has indicated that ambiguity regarding acceptable AI usage, apprehension about potential accusations, and inconsistent guidance from institutions can exacerbate stress and performance anxiety.^{38,39} In this study, students discussed similar tensions, saying they often felt emotionally dependent on ChatGPT while also worrying about being watched and about privacy and academic consequences. These accounts highlight that institutional ambiguity, rather than merely an AI application, can profoundly affect students' emotional experiences.

Despite the study's emphasis on higher education, its findings hold significance for broader discussions about the institutional integration of AI technologies. Research in applied fields such as healthcare indicates that while organizations may be enthusiastic about AI—often driven by factors like efficiency, scalability, or cost savings—this enthusiasm can exist alongside uncertainty, inconsistent implementation, and unforeseen effects on users.⁴⁰⁻⁴³ Although these studies do not directly pertain to education, they reveal a shared context: organizations are increasingly integrating AI systems as supportive tools, which could indirectly influence students' expectations, exposure, and reliance on such technologies. Students' understandings and engagements with conversational AI are likely shaped by this broader institutional framework.

Together, the findings support an attachment-informed viewpoint regarding the application of AI, suggesting that emotionally attuned systems may serve as supplementary regulators in high-stress situations. This explanation, highlighting the potential for unmet social or emotional needs to be channeled toward external supports, aligns with theories of affective attachment and frameworks concerning psychological needs.³⁰⁻³⁴ This does not inherently imply that utilizing ChatGPT results in dependence.⁴⁴⁻⁴⁵ The narratives imply that measured and intentional use might correlate with well-being, whereas prolonged emotional reliance—especially when it supplants social support—could lead to heightened sensations of isolation, anxiety, and disconnection.

It is equally essential to explore alternative explanations. Students experiencing anxiety, loneliness, or pressure

to excel academically may be more inclined to seek comfort in AI, potentially influencing their choices. Ambiguous institutional regulations and cultures focused on assessment can each contribute to heightened anxiety and a greater reliance on AI. These factors emphasize the necessity for mixed-methods and longitudinal studies to elucidate directionality and distinguish between patterns of use that enhance risk and those that are preventive.

Practically speaking, the findings suggest that universities should implement strategies focused on digital well-being rather than engage in binary debates about AI use. These may encompass AI literacy initiatives that emphasize cautious and thoughtful engagement, structured opportunities for peer-to-peer interaction, clearer directives regarding academic integrity, and support mechanisms for students experiencing distress related to their technology use. Theoretically, future research ought to examine the interplay of institutional practices, social support, emotion regulation, and emotional reliance on AI as they evolve over time and across various contexts.

When evaluating the findings, it is crucial to acknowledge the limitations inherent in this study. First, given that student status and contextual information could not be independently confirmed, the statistics, which were based on self-selected Reddit posts, do not accurately reflect the broader university student population. Second, the conventions of these platforms may promote exaggerated or reflective storytelling, potentially amplifying more adverse or emotional experiences. Third, depending exclusively on publicly available posts restricted the chances for clarification, exploration, or cross-verification through surveys, interviews, or observational data. Instead of serving as estimates of prevalence or causal connections, the data ought to be interpreted as naturalistic representations of individual experiences. Ultimately, the cross-sectional nature of the data constrains the ability to draw conclusions regarding intra-individual changes over time, despite several narratives indicating a transition from academic usage to emotional reliance.

5. Conclusion

This study examined how university students narrate their emotional, social, and intellectual experiences with the usage of ChatGPT. Students' narratives revealed patterns in which academic assistance is occasionally mixed with emotionally driven involvement, including reassurance-seeking and perceived dependence. These reports represent students' perceptions of their experiences rather than causal or developmental pathways.

For certain students, ChatGPT was characterized as an easily available and non-judgmental resource during times

of stress or uncertainty. Simultaneously, other accounts underscored apprehensions over heightened anxiety, diminished peer engagement, and ambivalence subsequent to emotionally driven usage. These experiences seemed to differ based on individual situations, interaction habits, and overarching academic environments.

The results indicate that conversational AI can serve both as a learning assistance tool and, in some situations, as an external coping resource. Students showed increased anxiety or social retreat when AI-mediated reassurance was characterized as a replacement for interpersonal involvement. Conversely, other narratives highlighted instrumental or limited use without perceived adverse consequences. This variance highlights the necessity of refraining from consistent assumptions regarding AI-related results.

Higher education institutions may gain advantages from strategies that combine AI literacy with digital well-being efforts. Explicit institutional directives on suitable usage, organized avenues for collaborative learning, and assistance for students facing technology-induced stress may facilitate thoughtful and equitable interaction with conversational AI.

Future studies should investigate the interplay between AI usage habits and emotion control, motivation, peer interaction, and institutional environment across time. Longitudinal and mixed-methods approaches may elucidate how students incorporate conversational AI into their academic and personal practices. Cultural and educational contexts must also be taken into account, as interactions with AI may vary across different situations.

The findings support a human-centered approach to AI integration in higher education, acknowledging conversational AI as a potentially beneficial academic resource while promoting deliberate, constrained, and socially engaged use.

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Conflict of interest

The authors declare no competing interests.

Author contributions

Conceptualization: All authors

Data curation: Anas Ali Alhur

Formal analysis: Anas Ali Alhur

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Project administration: Badr Alnasser

Supervision: Badr Alnasser

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Writing—original draft: Anas Ali Alhur

Writing—review & editing: All authors

Ethics approval and consent to participate

This study analyzed publicly accessible, non-restricted online data. All posts were anonymized and paraphrased to minimize traceability and protect user privacy. Ethical approval was granted by the University Research Ethics Committee, University of Ha'il (Approval No. H-2024-014, approval date: [25/06/2025]). Informed consent was not required as the study did not involve direct interaction with individuals. Data were handled in accordance with ethical guidance for internet-mediated research.

Consent for publication

Not applicable.

Availability of data

De-identified excerpts, the codebook, and screening logs are available upon reasonable request to the corresponding author. URLs/handles are not retained to protect privacy. The dataset comprises publicly accessible Reddit posts. To reduce the risk of reverse identification, raw posts, URLs, and direct quotations are not shared. De-identified and paraphrased excerpts supporting the findings are provided within the manuscript and appendices.

Further disclosure

The authors utilized ChatGPT (OpenAI, GPT-5 series) for language polishing and minor editorial support during manuscript preparation. All AI-assisted text was carefully reviewed, revised, and verified by the authors to ensure accuracy, integrity, and compliance with academic standards. The authors take full responsibility for the final content of the manuscript.

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Appendix

Appendix A. Reddit search strategy and inclusion criteria

A.1. Data source

Data were collected from Reddit, an online platform hosting large, topic-specific communities where users share personal experiences and opinions under pseudonymous identities. Reddit was selected due to its open accessibility and active student communities discussing academic life, mental health, and technology use. All data were publicly available at the time of collection and were handled in accordance with established ethical guidance for research using publicly accessible online content.

A.2. Time frame

Posts published between January 2023 and October 2025 were eligible for inclusion. This period captured student experiences during the rapid adoption of ChatGPT in academic contexts.

A.3. Screening and selection process

Initial screening excluded irrelevant, promotional, or technical posts. Full-text review assessed narrative depth and experiential relevance. Of 217 screened posts, 83 met the inclusion criteria.

Appendix B. Thematic codebook

This codebook summarizes the six synthesized themes, associated sub-codes, operational definitions, and sample paraphrased excerpts. Codes were developed inductively through iterative open coding and structured consolidation within a team-based codebook thematic analysis framework.

Theme	Sub-codes	Operational definition	Sample paraphrased quote
1. Emotional reliance and reassurance-seeking	Emotional attachment; companionship; habitual checking; reassurance-seeking	Descriptions of ChatGPT functioning as a primary or habitual source of emotional validation beyond academic support	"Over time, it became where I go when I feel stressed."
2. Social withdrawal and displacement of peer interaction	Peer avoidance; preference for artificial intelligence (AI)-mediated help; reduced group participation	Reduced engagement with peers in favor of AI-based support, perceived as safer or less demanding	"It feels easier than explaining myself to classmates."
3. Anxiety amplification and cognitive overload	Reassurance loops; rumination; escalation; sleep disruption	Repeated questioning patterns are associated with heightened anxiety or mental fatigue	"I kept asking the same thing and felt worse each time."
4. Academic integrity pressure and performance anxiety	Fear of accusation; hyper-editing; surveillance concern	Anxiety linked to perceived AI detection or academic scrutiny	"I rewrite everything so it won't look like AI."
5. Reduced intrinsic motivation and creative disengagement	Self-comparison; diminished agency; creative stagnation	Reduced motivation or enjoyment due to unfavorable comparison with AI outputs	"It made me stop trying to write on my own."
6. Trust, privacy, and emotional vulnerability	Data anxiety; regret after disclosure; surveillance unease	Retrospective discomfort about privacy after sharing personal information	"Afterward, I worry about where that information goes."

The following coding notes were applied:

- (i) Initial line-by-line coding conducted across all 83 posts.
- (ii) Codes were grouped and synthesized into six overarching themes.
- (iii) A structured codebook guided team coding and refinement.
- (iv) Intercode agreement was assessed (see Methods).
- (v) Coding was conducted manually in Excel.

Appendix C. Paraphrasing protocol and thematic excerpt matrix

C.1. Paraphrasing protocol

Given that verbatim quotations from online platforms can be searchable through web search engines and potentially enable reverse identification of users, all excerpts presented in this study were systematically paraphrased. The goal of paraphrasing was to preserve the analytic meaning of student narratives while reducing the risk of traceability.

The paraphrasing process followed three structured steps:

- (i) Step 1: Meaning identification. The research team first identified the core experiential meaning of each narrative segment relevant to the coded theme. This step focused on the substantive idea expressed by the student rather than the original wording.
- (ii) Step 2: Linguistic transformation. Narratives were then rewritten using new wording while maintaining the original meaning. During this process, distinctive phrases and stylistic elements were removed, sentence structure was altered, identifiable contextual details were generalized, and wording that could enable search-based identification was avoided.
- (iii) Step 3: Analytic verification. Following paraphrasing, each excerpt was reviewed against the coded theme to ensure that the interpretive meaning remained consistent with the original narrative. When necessary, minor adjustments were made to maintain fidelity to the intended meaning. To further reduce re-identification risk, usernames, timestamps, URLs, and other identifiers were removed during data extraction, posts from small or highly sensitive communities were excluded, and only minimal contextual information (e.g., general subreddit category) was retained.

All excerpts in the manuscript are therefore analytic paraphrases rather than verbatim quotations.

C.2. Theme-aligned paraphrased excerpt matrix

Table C1 provides illustrative examples of paraphrased excerpts aligned with the six synthesized themes identified in the analysis. The table includes minimal contextual metadata to enhance analytic transparency while preserving anonymity.

C.3. Metadata and privacy safeguards

To minimize the risk of identifying individual users, only minimal contextual metadata is presented. The following information was retained for analytic purposes:

- (i) general subreddit category (e.g., student academic forum, graduate forum, mental-health discussion forum),
- (ii) approximate topic context,
- (iii) thematic code assigned during analysis.

Specific identifiers such as usernames, timestamps, post URLs, and unique narrative details were removed during data extraction and were not retained in the analytic dataset.

Appendix D. Reflexivity statement

The lead researcher is a university lecturer and PhD candidate in health informatics with professional experience in digital health and AI in education. This background provided contextual familiarity with AI adoption in academic settings.

To enhance analytic transparency, reflexive journaling and peer debriefing were conducted throughout coding and theme development. Reflexivity was used to acknowledge positionality and potential assumptions while maintaining analytic rigor within a structured codebook-based approach.

Personal perspectives regarding AI innovation were explicitly acknowledged and bracketed during analysis to reduce interpretive bias.

Table C1. Illustrative paraphrased excerpts aligned with synthesized themes

Theme	Paraphrased excerpt (illustrative)	Context category	Indicative topic
Emotional reliance and reassurance-seeking	A student described gradually turning to ChatGPT whenever they felt overwhelmed, noting that it became their default place for reassurance during stressful academic periods	Student academic forum	Emotional coping
	A student explained that interacting with ChatGPT had become part of their daily routine, similar to checking in with a supportive friend when feeling uncertain	Mental-health discussion forum	Habitual reassurance
Social withdrawal and displacement of peer interaction	A student reported that asking ChatGPT questions felt easier than approaching classmates, and over time, they began avoiding group study conversations	Student academic forum	Peer avoidance
	A narrative described gradually withdrawing from study groups because artificial intelligence (AI) assistance felt less stressful than explaining difficulties to peers	Graduate student forum	Reduced collaboration
Anxiety amplification and cognitive overload	A student explained repeatedly asking the same question in slightly different ways, hoping to feel reassured, but instead became more anxious	Anxiety support forum	Reassurance loop
	Another narrative described late-night interactions with ChatGPT that left the student mentally exhausted and unable to disengage	Student academic forum	Cognitive fatigue
Academic integrity pressure and performance anxiety	A student described feeling anxious about whether their writing might be mistaken for AI-generated content, even when ChatGPT was not used	Academic discussion forum	Detection anxiety
	A narrative described repeatedly editing assignments to ensure the writing would not appear automated or suspicious	Student academic forum	Hyper-editing
Reduced intrinsic motivation and creative disengagement	A student reflected that comparing their own work with AI-generated responses reduced their confidence and motivation to write independently	Graduate student forum	Self-comparison
	Another narrative described feeling discouraged after seeing how quickly ChatGPT produced polished responses compared with their own effort	Student academic forum	Creative disengagement
Trust, privacy, and emotional vulnerability	A student described sharing personal concerns with ChatGPT and later worrying about where that information might be stored	Mental-health discussion forum	Data concerns
	Another narrative expressed unease about discussing emotional issues with AI, noting a lingering sense of vulnerability afterward.	Student support forum	Privacy unease

Appendix E. Analysis timeline and workflow

This appendix outlines the procedural steps followed in data collection, screening, coding, and codebook thematic analysis.

Phase	Time period	Activity	Details
1	Dec 2024–Jan 2025	Study planning	Research aims defined; search strategy finalized; ethical approval obtained
2	Jan–Oct 2025	Data collection	Manual search and extraction; 217 posts identified
3	Feb–Oct 2025	Screening	Application of inclusion/exclusion criteria; 83 posts retained
4	Feb–Oct 2025	Data preparation	De-identification and paraphrasing
5	Feb–Nov 2025	Familiarization	Repeated reading and analytic memoing
6	Mar–Nov 2025	Open coding	Line-by-line coding of narratives
7	Apr–Nov 2025	Code consolidation	Development of structured codebook; synthesis into six themes
8	May–Dec 2025	Intercoder agreement	Independent coding subset; $\kappa = 0.81$
9	Sep–Dec 2025	Narrative synthesis	Integration of themes and cross-cutting patterns
10	Dec 2025	Figure preparation	Conceptual thematic map formatted using design software (content derived from coded themes)
11	Dec 2025	Final manuscript preparation	Appendices and audit trail finalized