From “corrector” to “co-author”: How college students’ interaction with AI writing assistants affects academic writing process engagement

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The growing use of artificial intelligence (AI) writing assistants in academic contexts is changing how college students approach and experience the writing process. This study used a grounded theory approach to examine how students’ interactions with AI tools affect their engagement in academic writing. Data were gathered through in-depth, semi-structured interviews with 25 undergraduate students from different academic disciplines. The analysis generated a core category called *transforming writing engagement: students’ evolving partnership with AI writing assistants*. The findings show that students often move from seeing AI as a basic “corrector” to, in some cases, perceiving it as a “co-author-like” assistant. This shift involves ongoing decisions about agency, control and authenticity. Student engagement was found to include behavioural, affective and cognitive aspects. The study presents a theoretical model that explains these changes and offers insights into how students negotiate their writing practices when working with AI. It also emphasises the need to build students’ critical understanding of AI tools, so that these technologies support rather than replace their active thinking and learning during academic writing.

Implications for practice or policy:

- Educators should design reflective writing assignments to help students practise effective prompting and assess AI-generated content to foster critical AI literacy.
- Instructional designers should develop targeted resources to help students balance AI use with personal agency.
- Policymakers should establish ethical guidelines for AI use in academic writing.

Keywords: academic writing, learning engagement, human-AI interaction, agency, grounded theory

Introduction

The increasing use of artificial intelligence (AI) tools for writing support has become a noticeable trend in higher education, especially among college students who are facing the demands of academic writing. In this study, these tools are referred to as *AI writing assistants*, which include tools ranging from basic grammar checkers to more advanced generative AI models used at different stages of academic writing. Students are increasingly using these assistants for purposes such as generating ideas, drafting and revising (Biondi-Zoccai et al., 2025; Fodouop Kouam, 2024). As AI tools continue to improve, their role in the writing process is changing, making it necessary to explore how students respond to and manage these changes.

Studies have extensively examined students’ general perceptions of these tools and their impact on final writing quality (Kim et al., 2025; Wang, 2025). Much of this discussion has highlighted functional benefits, such as improved language accuracy (Zhao, 2025), or focused on ethical risks, including plagiarism and potential overreliance (Biondi-Zoccai et al., 2025). However, there remains a critical gap regarding the writing process itself. As AI evolves from a simple tool to a more advanced “partner”, there is still limited

understanding of how students' specific interactions with these tools reshape their engagement throughout the academic writing workflow (Chaudhari et al., 2025; Tumiran et al., 2024). Specifically, few studies have explored how this shifting role influences the way students maintain agency and sustain cognitive involvement while navigating complex human-AI partnerships (Draxler et al., 2024; Hutson, 2026).

This study used a grounded theory approach to explore how college students' interactions with AI writing assistants affect their engagement at different stages of academic writing. The goal was to develop a theoretical model based on students' experiences, showing how their writing practices change when they use AI tools that offer more advanced support. A central focus was to understand how students see and respond to the changing role of AI, especially when they view it not just as a tool for correction, but as something closer to a "co-author". It is important to explain that the term *co-author* here is used only to describe students' perceptions of AI's contribution to the writing process. It reflects how students experience and describe the way AI contributes to the content and structure of their writing. It does not suggest that AI meets the criteria for formal authorship under current academic or ethical standards. This study addressed the following research questions (RQs):

- RQ1: How do college students describe their interactions with AI writing assistants during different stages of the academic writing process?
- RQ2: In what ways do these interactions with AI writing assistants influence students' reported engagement with their writing tasks?
- RQ3: How do students perceive and manage the role of AI writing assistants as it appears to shift from a "corrector" to a "co-author-like" assistant in their writing practices?

Literature review

The evolving role of AI in academic writing

In the early stages, many AI writing tools focused mainly on corrective support, such as checking grammar, improving sentence structure, and detecting plagiarism (Fodouop Kouam, 2024). These tools can improve the technical quality of writing by making it clearer and more accurate. However, the functions of AI tools have expanded. Newer generative AI systems can now support more complex writing tasks, including generating ideas, drafting content, summarising sources and offering suggestions on writing style (Kusmanto et al., 2025). This development reflects a shift in AI's role, from simply correcting text to playing a broader part in the writing process.

The increased range of functions offered by AI writing assistants brings many advantages for academic writers. Students report that these tools help them write more efficiently, provide useful language support, especially for non-native speakers, and allow them to quickly create starting points for their assignments (Chaudhari et al., 2025; Kim et al., 2025). AI can support different stages of writing, from planning to revision, and may reduce the mental effort needed for technical tasks (Hong et al., 2025). This can give students more time to focus on developing arguments and analysing ideas. Many students also value the immediate feedback AI provides, which helps them improve their drafts (Chen, 2026).

Even with these reported benefits, the changing role of AI in academic writing also brings challenges. There are concerns about the accuracy and reliability of AI-generated content, including the risk of false or misleading information, often called "hallucinations" (Nah et al., 2023). Ethical issues are also widely discussed, especially authorship, originality and possible overreliance on AI (Chaudhari et al., 2025). Many teachers worry that frequent use of AI may limit the growth of students' own thinking and writing abilities (Hao et al., 2026). Understanding its impact requires examining both benefits and risks, and how they influence students' engagement in writing.

The interplay of human and AI agency in academic writing

The use of advanced AI writing assistants raises questions about agency, defined as the capacity to act independently and make choices (Xu et al., 2025). In traditional writing, human agency includes controlling idea generation, constructing arguments, expressing personal style and shaping the overall meaning of a text (Noller, 2024). However, as AI assumes tasks once exclusive to humans, we must reconsider how agency is distributed (Natale et al., 2025). Engaging with AI is not merely tool usage but a collaborative process in which students' intentions and the AI's capabilities jointly shape the final product (Kang & Lou, 2022). Consequently, we need to examine how students maintain or redefine their agency within this evolving dynamic.

Scholars hold different views on the human-AI agency relationship. Some frame AI as an extension of human agency that enhances efficiency while keeping the student in control (Noller, 2024). Others emphasise the increasingly active role of AI, particularly its ability to generate original content (Holter & El-Assady, 2024). This suggests a form of machine agency in which AI noticeably influences writing outcomes (Kang & Lou, 2022). In this view, writing becomes a shared space where agency is distributed across the interaction rather than held solely by the student.

This dynamic complicates students' perceptions of control and responsibility during writing. While AI aids in generating or revising text, it can blur authorship (Draxler et al., 2024). However, a clear distinction remains because current AI lacks human intent and reasoning, preventing true agency equality (Swanepoel & Corks, 2024). For this reason, students must learn to work with AI in ways that support their thinking and protect their academic voice and contribution (Han, 2025; Mouta et al., 2025).

AI writing assistants and student engagement in academic writing

Student engagement is a multidimensional construct that includes behavioural, affective and cognitive components (Fredricks et al., 2004), which may interact differently with AI features and limitations (Engeness et al., 2025). As students use AI from idea generation to final revisions, their involvement is transforming. This shift offers new support but also poses challenges to deeper learning (Kim et al., 2025; Wang, 2025).

Behavioural engagement, involving observable actions and effort, is particularly sensitive to AI use. One noticeable change lies in how students participate in different writing stages. For example, using AI to brainstorm or outline ideas may lead to earlier starts or diverse planning, as reflected in earlier drafting activities (Kim et al., 2025; Wang, 2025). Conversely, relying on AI to generate text may reduce time spent composing original sentences, indicating a shift in active contribution during drafting (Luther et al., 2024). Revision patterns also change. Students may revise more often when AI provides immediate feedback, or accept suggestions with less redrafting, altering engagement depth (Erdawati et al., 2025; Nguyen et al., 2024). Feedback seeking has evolved too. Students now engage in new writing-related behaviours such as typing prompts, selecting alternative outputs and incorporating them into texts (Chen, 2026).

Affective engagement refers to students' emotional responses to learning activities, and it is also shaped by AI. Many students report positive emotions when AI addresses writing difficulties. For instance, immediate language support or help with structuring ideas can reduce anxiety and enhance self-efficacy, making the process more manageable and less stressful (Kim et al., 2025; Wang, 2025). This often increases enjoyment and motivation as students feel more capable (Aladini et al., 2025). When AI seems helpful and responsive, it fosters a positive experience and a stronger willingness to engage (Chen, 2026). However, effects are not always positive. If AI contributes heavily to content, students may feel less connected or satisfied, even with correct results (Draxler et al., 2024). Thus, while AI eases difficulties, students' emotional connection to their work still depends on ownership and meaningful involvement.

Cognitive engagement, referring to the mental processes and learning strategies that students use while writing, is deeply affected by human-AI interaction. Used strategically, AI supports cognitive engagement by reducing time spent on routine tasks, letting students focus on analysing, evaluating and synthesising

ideas (Hong et al., 2025; Kim et al., 2025). AI can prompt deeper thinking by suggesting new perspectives or identifying argument gaps, thus encouraging further inquiry and reflection (Kim et al., 2025; Wang, 2025). Assessing AI feedback also supports metacognitive development, as students become more aware of their reasoning and learning strategies when deciding whether to use suggestions (Chen, 2026; Engeness et al., 2025). This helps them monitor writing goals and make informed revisions (Aladini et al., 2025). However, cognitive gains are not automatic and depend on critical engagement. If students simply use AI to generate content or accept feedback without reflection, their involvement remains surface-level. Thus, overreliance on AI for constructing arguments or developing original ideas may weaken students' analytical and creative abilities (Han, 2025).

Methodology

Participants and data collection

This study involved 25 undergraduate students from various disciplines and university levels in China. Participants were selected using purposeful sampling and snowball sampling. Purposeful sampling was first used to identify students with experience using AI writing assistants in their academic work. These students then referred peers who met the inclusion criteria. This strategy expanded the sample while maintaining relevance to the focus of the study.

As shown in Table 1, the participants reflected diverse institutional and academic backgrounds. In terms of university affiliation, students came from 985 Project and 211 Project universities, which were designated under national higher education development initiatives (Ge & Liu, 2026), as well as from other universities, thus providing variation in institutional context. Most participants were in their second, third or fourth year. First-year students were not included because they may have had limited exposure to academic writing tasks. Students in later years are generally more likely to have completed such tasks and to have used AI writing assistants in the process, making their experiences more relevant to the focus of this study. Participants' majors were also diverse, representing fields in the humanities and social sciences, engineering, and science and computing. This range allowed the study to capture different patterns of AI use and perceptions across various domains of academic writing.

Table 1
Demographic information of the participants (N = 25)

Characteristic	Category	Count
University level	985 Project university	8
	211 Project university	11
	Other universities	6
Academic year	Second year (sophomore)	9
	Third year (junior)	11
	Fourth year (senior)	5
Gender	Female	13
	Male	12
Major grouping	Humanities & social sciences	7
	Engineering disciplines	10
	Science & computing disciplines	8

In-depth semi-structured online interviews were conducted with all 25 participants to collect detailed data about their interactions with AI writing assistants, how these interactions evolved over time and how students perceived their effects on engagement with the academic writing process. I conducted the interviews between March and July in 2024, with each interview lasting approximately 30–40 minutes. All interviews were conducted in Chinese, and the interview excerpts presented in this article were translated into English. All participants were provided with information about the study's purpose and procedures, and informed consent was obtained prior to their participation. Participants were assured of anonymity

and their right to withdraw at any time. The English translation of the original Chinese semi-structured interview protocol is available at https://doi.org/10.6084/m9.figshare.33945307.

Research method and data analysis

This study employed a grounded theory approach informed by the procedural tradition of Corbin and Strauss (2014). Grounded theory was chosen for its capacity to generate substantive theory directly from participants' contextual experiences. This inductive methodology supports the identification of patterns and relationships as they emerge from the data, enabling a detailed understanding of the phenomenon.

The overall process followed in this study is illustrated in Figure 1. Data analysis followed the iterative procedures typical of procedural grounded theory as outlined by Corbin and Strauss (2014), beginning with open coding to identify initial concepts in the interview transcripts. Axial coding then examined relationships among these concepts and developed more abstract categories. Finally, selective coding integrated these categories into a cohesive theoretical framework. A constant comparative method was applied throughout to refine codes and ensure analytical rigour. NVivo software was used to organise the data, support coding and facilitate the identification of recurring patterns and themes.

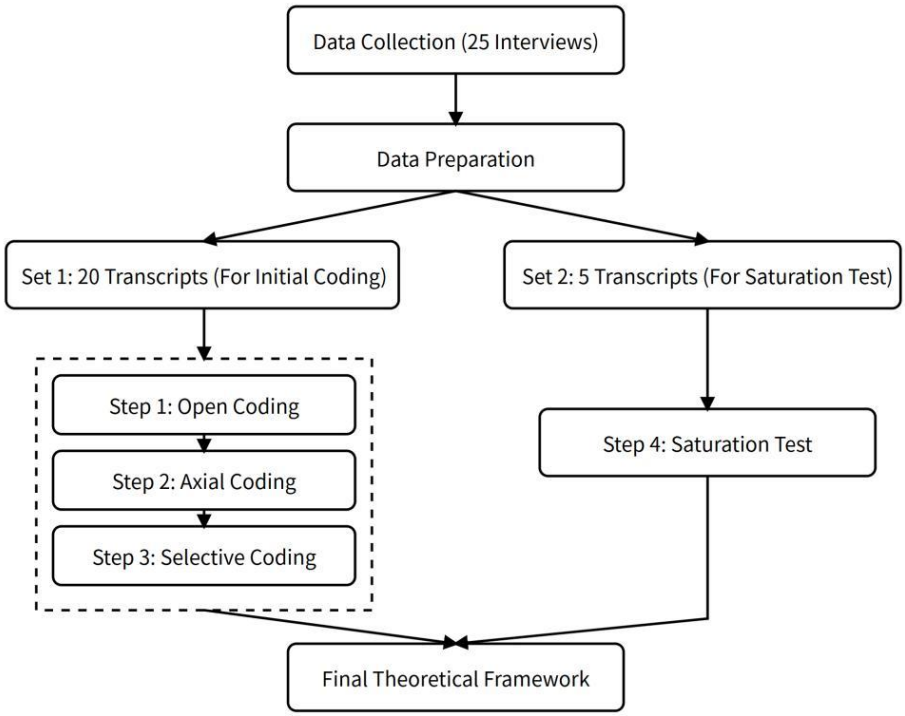


Figure 1. Data analysis process of the present study

Research trustworthiness

To enhance the trustworthiness of the findings, several measures were adopted during the data analysis phase. The coding process, central to grounded theory, was carried out with close attention to consistency and interpretive accuracy.

Instead of a single researcher developing the codes alone, a collaborative approach was employed. A co-author experienced in qualitative analysis and I independently conducted open coding on the same subset of interview transcripts (5 transcripts, representing 20% of the sample). This process aimed not at achieving statistical agreement, but at comparing interpretations, challenging assumptions and enriching the theoretical sensitivity of the analysis (Corbin & Strauss, 2014). The goal was to use any differences in interpretation identified during this process to further refine the concepts and coding framework.

Following this independent coding phase, the two of us engaged in a series of focused discussions to compare our coding outcomes line by line. This process was not merely a check for accuracy but a method of dialogic validation to collectively build a robust coding framework. We systematically identified areas of agreement and disagreement, re-examined the original data to clarify the meanings and boundaries of each concept and collaboratively established the initial coding scheme.

For instance, initial disagreements often centred on whether a student's statement reflected affective engagement or concerns about ownership. Through dialogue, we established clearer operational definitions; for example, statements expressing feelings such as confidence or anxiety were coded under affective engagement, while those related to the student's sense of control or personal voice were coded under ownership concerns. Consensus was reached on all segments through these discussions, ensuring that theoretical categories were not the product of individual bias but the result of rigorous analytical consensus. I subsequently applied the revised coding scheme to the full data set, with ongoing peer discussions to clarify ambiguous or complex segments.

Results

Open coding

The initial analysis involved open coding of 20 transcripts selected for initial coding. Each of the 20 transcripts was reviewed line by line to identify meaningful units. These units were conceptualised to capture core aspects of students' experiences, perceptions and behaviours regarding their interactions with AI writing assistants and the impact on their writing engagement. Through this iterative process of segmenting, comparing and labelling the data, a set of preliminary concepts was generated. These concepts were grouped into broader preliminary categories based on shared features and underlying meanings. In total, 17 preliminary categories (A1 to A17) and 74 preliminary concepts (a1 to a74) were identified from the 20 transcripts. Table 2 presents a selection of these preliminary categories and their associated concepts, along with illustrative quotes from participants (denoted as P). The full coding results are available at https://doi.org/10.6084/m9.figshare.33945310.

Table 2
Selected open coding results

Preliminary category	Preliminary concepts	Interview excerpts (translated from Chinese)
A1: Initial adoption drivers	a1: Curiosity about AI tools a2: Recommendations from peers (including classmates) a3: Addressing specific writing difficulties (e.g., structure, formality, idea generation, language expression)	(a1) "I tried ChatGPT out of curiosity after hearing about it from a classmate." (P20) (a2) "I heard about ChatGPT from classmates and decided to try it for help with a business report outline." (P7) (a3) "I was struggling to structure my comparative analysis." (P13)
A17: Expectations for future AI functions and roles	… a72: AI as a learning tool/scaffold/coach a73: AI to challenge student thinking a74: AI maintaining student's central role/agency	… (a72) "The ideal role of AI should be as an assistant that supports but never replaces the writer's critical thinking and voice." (P11) (a73) "It should be like a challenging editor — helpful, but also demanding." (P20) (a74) "Ideally, AI should support writers without replacing their critical thinking or responsibility for content." (P10)

Note. The ellipses indicate omitted categories (A2–A16) and their associated concepts and interview excerpts, as well as omitted concepts (a69–a71) and their corresponding excerpts under A17.

Axial coding

Following open coding, axial coding was carried out to further refine and integrate the preliminary categories. This stage systematically examined the 17 preliminary categories to uncover relationships, patterns, and overarching themes. The purpose of axial coding is to reassemble the data that had been broken apart during open coding and to construct more abstract and higher-level categories that help explain the central phenomenon, that is, how students' interactions with AI writing assistants influence their engagement in academic writing. Through analysis and comparison of the properties and dimensions of the preliminary categories, four main categories were developed. Table 3 presents these main categories (B1–B4), the preliminary categories they include and the relationships among them.

Table 3
Axial coding results

Main category	Preliminary categories	Description
B1: Dynamics of student-AI interaction development	A1: Initial adoption drivers A2: Early perceptions of AI role; A3: Evolution of AI interaction methods A4: Differentiation in AI tool use A5: Shifting perception of AI's role	Progression of student-AI interaction: from initial adoption motivations and early perceptions to evolved usage patterns, tool choices and transformed views of AI's role in writing.
B2: Negotiating agency and authenticity in AI-assisted writing	A6: Dynamics of student control vs AI reliance A7: Concerns about ownership & authenticity A8: Strategies to maintain ownership	Interplay between student control and AI reliance, including concerns over authorship, voice and authenticity, alongside strategies students use to assert agency and maintain ownership.
B3: Multifaceted impacts of AI on writing process engagement	A9: Behavioural engagement: Time & effort A10: Behavioural engagement: Writing process changes A11: Affective engagement: Positive emotions A12: Affective engagement: Negative emotions A13: Cognitive engagement: Critical thinking & evaluation A14: Cognitive engagement: Learning & understanding A15: Cognitive engagement: Risks & challenges	Effects of AI interaction on student writing engagement, including behavioural shifts in writing practices, affective responses to AI use and cognitive impacts on learning and critical thought.
B4: External influences and future outlook for AI in academic writing	A16: External influences & feedback A17: Expectations for future AI functions and roles	External influences on students' AI writing tool use, and their expectations for future AI, including desired functionalities and AI's ideal role in fostering learning and critical thinking.

Selective coding

To provide a detailed view of the data supporting the theoretical categories (B1–B4), a table is available at https://doi.org/10.6084/m9.figshare.33945313.

The selective coding phase identified a core category integrating the main categories. We conceptualised this core category as *transforming writing engagement: students' evolving partnership with AI writing*

assistants. The term *transforming* captures the shifts in students' behaviours, emotions and thinking processes. *Evolving partnership* denotes the changing dynamic between students and AI which moves beyond a simple tool-user relationship toward collaborative engagement. The storyline emerging from the data can be summarised as follows.

Students typically begin their interaction with AI writing assistants driven by immediate needs or curiosity (B1: Dynamics of student-AI interaction development). Initially, they may perceive AI merely as a functional tool. However, this perception shifts over time. As Participant 20 stated, "it feels more like a partner now, not just a proofreader". This shift leads to more complex interaction patterns involving strategic prompting and iterative dialogue.

As their interaction with AI deepens, students actively negotiate agency and authenticity (B2: Negotiating agency and authenticity in AI-assisted writing). This negotiation is more complex when AI contributes substantive content. While some students view the process as a form of co-authoring, they simultaneously express a strong desire to maintain ownership. For instance, Participant 1 stated, "I worry that if I rely too much on AI, I may lose my own voice". Consequently, students employ deliberate strategies to mitigate this risk. Participant 22 explained that she reads her writing aloud and revises "anything that does not match my tone" to ensure authenticity.

These interactions fundamentally reshape student engagement across three dimensions (B3: Multifaceted impacts of AI on writing process engagement). Behaviourally, the writing workflow becomes more efficient yet iterative. Participant 14 stated she spends "less time staring at a blank screen" because AI provides a starting point. Affectively, students report a complex mix of emotions. Participant 1 reported feeling "nervous and even a bit guilty" initially, though this often shifts to confidence when AI confirms their ideas. Cognitively, the impact is dual sided. Used reflectively, AI enhances critical thinking. As Participant 12 explained, "AI forces me to think critically since I must evaluate and verify its output." Conversely, passive reliance can hinder cognitive depth. Participant 21 warned that using AI too early makes him "get lazy and accept its logic without enough thinking".

The entire process is shaped by contextual factors and students' perspectives on the future of AI in academic writing (B4: External influences and future outlook for AI in academic writing). Institutional policies, teacher and peer feedback, and awareness of ethical boundaries all influence how students position AI in their writing practices. For instance, Participant 20 recalled a teacher noting that her writing sounded "too generic", which prompted her to incorporate more personal voice. In addition, their ongoing experiences shape their expectations for future AI development. Students often express a desire for tools that support learning and critical thinking without replacing their role as the primary author. As Participant 15 concluded, AI should "help us think, not think for us" and "challenge our logic, but not replace our responsibility".

Model construction

Based on the storyline, a theoretical model was constructed to illustrate the structural relationships among the categories (Figure 2). The core category, transforming writing engagement: students' evolving partnership with AI writing assistants, represents the overarching phenomenon that emerges from the interplay among the four main categories.

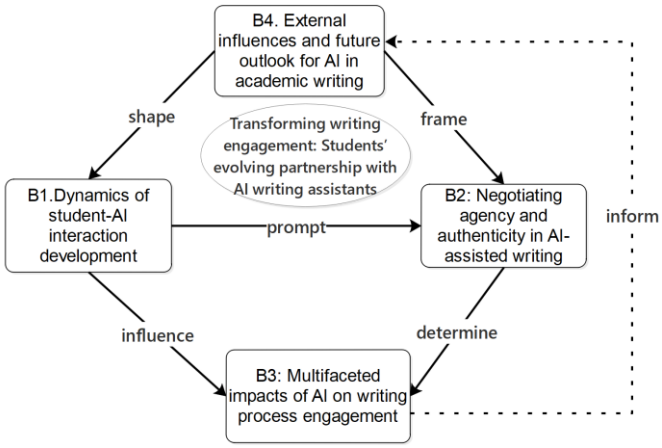


Figure 2. Model of student-AI writing assistant interaction and engagement

The model follows a logical process flow starting with dynamics of student-AI interaction development (B1), which describes how students initially adopt and learn to use AI. As students adopt and integrate AI tools into their workflow, this interaction prompts the process of negotiating agency and authenticity in AI-assisted writing (B2). This relationship exists because the introduction of an intelligent agent capable of generating content inevitably creates a tension regarding authorship, forcing the student to make conscious decisions about control and ownership.

The outcome of this negotiation helps determine the nature of multifaceted impacts of AI on writing process engagement (B3). If a student successfully negotiates agency (e.g., by actively revising), cognitive engagement deepens; if they surrender agency, engagement becomes superficial. Simultaneously, the interaction patterns in B1 influence various aspects of B3 directly, such as the redistribution of time between drafting and editing, regardless of the psychological negotiation.

Finally, this dynamic system operates within the context of external influences and future outlook for AI in academic writing (B4). Institutional policies and feedback shape the students' interaction patterns (B1) and frame the boundaries of their agency negotiation (B2). In turn, the students' actual engagement experiences (B3) inform their future expectations (B4), creating a feedback loop where lived practice shapes their vision of the ideal human-AI partnership.

Saturation test

Theoretical saturation was assessed based on the principles of grounded theory, which state that sampling should cease when categories are fully developed in terms of their properties and dimensions (Corbin & Strauss, 2014). To assess this, we adopted a systematic verification procedure informed by the initial analysis sample and stopping criterion framework proposed by Francis et al. (2010).

Specifically, after analysing 20 transcripts selected for initial coding, we conducted a focused analysis of the five transcripts reserved for saturation testing, which served as the stopping criterion sample. During this phase, our primary objective was to assess theoretical saturation rather than merely checking for code repetition. Consistent with the methodological arguments regarding qualitative sample size by Sim et al. (2018), we evaluated whether the new data provided any new conceptual variation that would require expanding the properties of the existing categories. The analysis of these final five transcripts confirmed that while individual narratives offered unique expressions, they conceptually mapped onto the established framework without generating new categories or altering the relationships within the model. This final sample size of 25 is broadly consistent with the commonly suggested range for grounded theory studies noted by Creswell and Poth (2024), while the adequacy of the sample was ultimately judged by theoretical saturation rather than by sample size alone. Consequently, we concluded that the data set had achieved sufficient conceptual density to support the proposed theory.

Discussion

The developmental trajectory of student interactions with AI writing assistants

RQ1 explored how college students describe their interactions with AI writing assistants throughout their academic writing process. The findings in main category B1 (Dynamics of student-AI interaction development) show that students follow a developmental path with changing practices, perceptions and strategies. Initially, students adopt AI writing assistants to address practical needs like grammar or structure, often out of curiosity or peer recommendations. At this stage, AI serves as a correction or language help tool (Kim et al., 2025; Wang, 2025), consistent with views of AI as a polisher rather than content contributor (Fodouop Kouam, 2024). For example, Participants 7 and 13 described initially using ChatGPT to structure reports or understand formal expressions.

As students gain experience, their interaction with AI evolves. They shift from using AI in later revision stages to involving it earlier, including brainstorming, outlining and drafting (Chen, 2026; Kim et al., 2025). Participant 20 said, "Now, I use it earlier in the process. Sometimes I even use ChatGPT to brainstorm how to structure my writing". This change shows increased confidence in AI beyond error correction. Students develop more advanced prompting methods, moving from simple questions to detailed, context-rich instructions and dialogic interactions where they ask AI to compare options, or improve outputs (Luther et al., 2024). Participant 23 described this as interacting "more dialogically ... I ask it to give options, compare styles, or explain why one version is better than another".

This development also includes more selective use of tools. Students choose specific AI assistants based on the task and the strengths of different platforms. For instance, many distinguished between Grammarly for surface-level corrections and generative models like ChatGPT for idea generation, argument support or restructuring (Zhao, 2025). This shows growing AI literacy and understanding of different tool functions. Consequently, students' views of AI change significantly. Many moved from seeing AI as a "corrector" to seeing it as an active assistant, a brainstorming partner or sometimes even a "co-author" capable of making meaningful contributions (Draxler et al., 2024; Hutson, 2026). This shift demonstrates that the student-AI relationship in academic writing is a dynamic and learned process, not a fixed technology use.

AI writing assistants and the transformation of student engagement in writing

RQ2 examined how interactions with AI writing assistants influence students' reported engagement with academic writing. Findings in main category B3 (Multifaceted impacts of AI on writing process engagement) show that AI reshapes engagement across behavioural, affective and cognitive dimensions. This effect varies by how students interact with AI (B1) and manage agency (B2).

Behaviourally, AI changes students' writing practices, effort distribution and workflow. Many participants reported adjusting time allocation across writing stages. For example, AI can speed up drafting or streamline proofreading, allowing more time for revision or content development (Chaudhari et al., 2025). Participant 13 said, "I now spend less time figuring out how to begin but more time checking and refining the AI-assisted parts". This often leads to more drafts, as students use AI to explore different phrasings or structures (Nguyen et al., 2024). Participant 6 explained that AI helps generate "multiple drafts to choose from", resulting in more time spent revising and organising. However, new behaviours also emerge, such as spending significant effort crafting prompts or editing AI output to ensure accuracy and coherence (Luther et al., 2024), reflecting a shift in effort application rather than simple reduction.

Emotionally, students' experiences with AI are complex. Many reported increased confidence and reduced anxiety, especially with difficult tasks or writing in a second language (Kim et al., 2025; Wang, 2025). Participant 7 expressed feeling "relief and motivation" when AI helps overcome writer's block. This support can promote a more positive attitude toward writing (Aladini et al., 2025). However, negative emotions also appear. Frustration arises when AI generates irrelevant or inaccurate content, as

Participant 8 noted, "I have felt frustrated when AI-generated text contains mistakes or irrelevant content, which then requires additional time to fix". Some students, like Participant 25, felt detached or ambivalent, worrying about reduced personal voice or academic integrity when relying heavily on AI (Draxler et al., 2024).

Cognitively, AI interaction has a dual effect: it can either enhance higher-order thinking or encourage superficial processing. Critical use, such as evaluating suggestions or comparing outputs, improves cognitive engagement (Chen, 2026; Engeness et al., 2025). Participant 12 said, "AI forces me to think critically since I must evaluate and verify its output". Many students reported that AI helped them better understand academic structure, logical flow and tone (Erdawati et al., 2025). Yet, the risk of reduced cognitive engagement exists if students accept AI suggestions passively (Han, 2025; Rafi & Amjad, 2025). Participant 21 warned, "If I use AI early, I sometimes get lazy and accept its logic without enough thinking". Thus, cognitive effects depend greatly on how students approach AI use, showing the need for critical AI literacy to support, not replace, deep intellectual effort.

Student perceptions and navigation of AI's evolving role: from corrector to perceived "co-author"

RQ3 examined how students perceive and navigate AI's changing role, especially the shift from a basic "corrector" to what they perceived as a more involved, co-author-like assistant. The findings, mainly from main category B2 (Negotiating agency and authenticity in AI-assisted writing) and B1 (Dynamics of student-AI interaction development), show that students are aware of and actively responding to this change. Participant 20 explained, "Yes, it is shifting. In some writing tasks, I start by putting in bullet points and asking for a draft, then edit from there. That feels like co-authoring". Others described AI's role in generating ideas, structuring arguments, and drafting large sections of text. This view of AI as a "co-author" aligns with research suggesting that AI's role is expanding beyond just a tool (Hutson, 2026). Thus, students see themselves not just as users but as partners in a writing process where AI influences content and form.

This shift raises tension around agency, control and authenticity, which students actively manage. While recognising AI's growing abilities, many participants seek to retain control of their writing and preserve their authorial voice. Participant 7 said, "I am concerned about losing ownership if I rely too much on AI, so I try to keep control by editing all AI output thoroughly". Concerns about losing ownership or having AI overshadow their personal style were common, echoing findings about the perceived ownership of AI-generated text (Draxler et al., 2024). To address these concerns, students reported strategies to maintain agency and authenticity, including drafting initial versions themselves before using AI (Participant 23), heavily editing AI-generated text (Participant 11) and limiting AI use by personal rules (Participant 17). These behaviours show that students do not simply accept AI's contributions but actively guide its influence.

Students' navigation of AI's evolving role also involves rethinking responsibility for their writing. For example, Participant 1 described a division of labour: "70% me, 30% AI", reflecting a conscious sharing of work. Yet, students still see themselves as responsible for the final product and its intellectual integrity. Feedback from teachers or peers that their writing was overly polished, as Participant 14 experienced, prompts students to reconsider their AI use and develop strategies to integrate AI output. This supports calls for fostering critical AI literacy so students can use AI as a partner that enhances rather than replaces their own skills (Han, 2025; Noller, 2024).

Contextual variations across disciplines and academic stages

Although the core category captures the common experience of students, our data suggests discernible variations shaped by academic discipline and the students' stage of study. While the current sample size does not permit statistical generalisation, qualitative differences in the nature of the partnership with AI were evident.

First, disciplinary backgrounds appeared to influence the primary function of AI in the writing process. Students in science, technology, engineering and mathematics fields tended to adopt a more instrumental approach, using AI to overcome linguistic barriers in technical reporting or to verify logical consistency. For instance, Participant 17 (mechanical engineering) described using AI specifically for "rewriting technical content into academic language", focusing on precision and formality. In contrast, students in humanities and social sciences described a more rhetorical and dialogic engagement, centring on argumentation and style. However, this deeper engagement often triggered heightened anxiety regarding agency. As Participant 1 (English major) noted, she became mindful when her writing tone became "too neutral", actively intervening to personalise the text to preserve her unique authorial voice.

Second, the students' academic year, which reflects their experience level and task stakes, also shaped their engagement. Senior students (Year 4), who were often working on capstone projects, demonstrated a more critical and cautious reliance on AI compared to their junior counterparts. Their engagement was heavily influenced by concerns over academic integrity and the requirement for originality in high-stakes assessments. For example, Participant 14 (Year 4) expressed concern about AI weakening her authorial control, explaining that she now highlights AI-generated content and asks herself, "Can I justify this sentence?" before retaining it. Conversely, sophomores (Year 2), such as Participant 21, tended to view AI more as a learning scaffold to master the basics of academic structure and expression, describing it as "showing me the road when I was stuck" and noting that it helped him learn clearer topic sentences and transitions, with less immediate anxiety about authorship boundaries.

The Chinese higher education context may also have shaped how students perceived and used AI writing assistants. In this study, participants came from universities with different institutional profiles, where academic achievement, writing quality and assessment performance may carry different levels of pressure. Within this context, students' use of AI was not only a matter of individual preference, but was also influenced by teacher expectations, peer attitudes and perceived institutional boundaries around academic integrity. This may help explain why some students described AI as a useful scaffold for improving structure, language and efficiency, while also expressing concern about ownership, originality and whether their writing still reflected their own voice. These contextual features should be considered when interpreting the findings and when transferring the model to other higher education settings, where assessment cultures, institutional policies and attitudes towards AI-assisted writing may differ.

Implications of the study

The findings of this study contribute to the theoretical understanding of how students interact with AI writing assistants. First, the core category, transforming writing engagement: students' evolving partnership with AI writing assistants, along with its main categories, offers an empirically based theory that captures the nature of college students' engagement with AI during academic writing. This model builds on existing human-AI collaboration frameworks (Holter & El-Assady, 2024; Hutson, 2026) by emphasising the evolving partnership and the negotiation of roles and agency in an educational setting. Second, the study adds to discussions of agency in human-AI interaction by showing how students manage the balance between their control and AI's capabilities (Kang & Lou, 2022; Noller, 2024). The strategies students use to maintain authenticity and control reveal how human agency is reshaped when working with intelligent systems (Xu et al., 2025). Third, this research deepens theories of student engagement by identifying behavioural, affective and cognitive changes that arise in AI-supported writing, thereby showing how technology affects students' involvement and thinking during academic tasks.

These insights also lead to practical implications. For students, the findings stress developing critical AI literacy, including effective prompting, assessing AI-generated content and managing interaction to preserve their authorial voice and cognitive engagement (Han, 2025). Awareness of reliance on AI and strategies to retain ownership can help students use these tools more ethically and effectively. For educators, teaching should address AI's growing role by designing assignments that promote critical and reflective AI use and discussion of academic integrity and authorship (Chen, 2026; Rafi & Amjad, 2025), and by supporting students in developing skills for productive human-AI collaboration. AI developers might respond to students' desire for transparent AI features, such as explanations of reasoning or

prompts that encourage deeper thinking, positioning AI as a learning support rather than just a content generator. Lastly, academic institutions should establish clear policies on the ethical use of AI writing assistants (Nah et al., 2023), assist faculty in integrating AI tools into teaching and promote students' digital and AI literacy.

Conclusion

This study examined the changing relationship between college students and AI writing assistants, revealing a clear transformation in how students engage with academic writing. The core finding, transforming writing engagement: students' evolving partnership with AI writing assistants, describes a dynamic process in which students move from using AI mainly as a corrective tool to engaging with it as a more involved writing assistant for idea generation, structuring and drafting. This developing partnership involves ongoing negotiation of agency and authenticity, as students work to maintain their authorial voice while making use of AI's capabilities.

The findings show that students' interactions with AI follow a developmental trajectory, reshape their engagement across behavioural, affective and cognitive dimensions and involve the negotiation of agency as students perceive AI's role shifting from a "corrector" towards what they describe as a "co-author-like" assistant. The proposed model contributes to research on human-AI collaboration and agency by showing that students are not passive users of AI tools. Rather, they actively decide how much control to retain, how to revise or verify AI-generated output and how to preserve their own voice in AI-assisted writing. At the same time, the findings highlight the dual effects of AI: it can increase confidence and efficiency, but may also encourage overreliance or shallow intellectual involvement if used uncritically.

Regarding limitations, the findings are mainly based on undergraduate students from a limited range of disciplines and university settings. Future research could extend this work in two directions. First, longitudinal studies could track how student-AI partnerships develop over time, particularly how agency negotiation changes as students become more experienced academic writers. Second, comparative studies could examine whether the instrumental approach to AI use, focused mainly on language and technical support, and the dialogic approach, focused on discussing ideas and developing arguments, also appear across broader student populations in science, technology, engineering and mathematics and the humanities.

Author contributions

Zi-Gang Ge: Conceptualisation, Methodology, Investigation, Data curation, Data analysis, Visualisations, Writing – original draft, Writing – review and editing; **Yong Liu:** Data interpretation, Writing – review and editing.

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