

The Impact of Artificial Intelligence on the Creativity of Chinese College Students

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Abstract

The rapid integration of artificial intelligence (AI) tools into higher education has sparked debate about their influence on students' creativity, critical thinking, and problem-solving abilities. Drawing on the technology acceptance model (TAM) and cognitive load theory (CLT), this qualitative study explores how college students perceive and experience AI tools in creativity-related tasks. Semi-structured interviews were conducted with seven undergraduate students from diverse academic disciplines (computer science, psychology, engineering, art & design, business, literature, and mathematics). Thematic analysis revealed three overarching themes: (a) AI enhances creative thinking and problem-solving by reducing cognitive load and offering novel perspectives, but participants expressed concerns about over-dependence and loss of independent thinking; (b) AI's role in creative output varies across academic and non-academic contexts-providing efficiency and inspiration while sometimes restricting originality and emotional depth; (c) students hold ambivalent attitudes, valuing AI's utility but questioning its impact on authenticity, ownership, and academic integrity. The findings indicate that AI can serve as a catalyst for creativity when used as a supportive tool, but educational institutions must develop clear guidelines to prevent cognitive offloading, ethical misuse, and the erosion of original thought. Practical implications are discussed for educators, policymakers, and AI designers.

Keywords: artificial intelligence, college students, creativity, technology acceptance model, cognitive load theory, qualitative study

1. Introduction

Artificial intelligence (AI) has become deeply embedded in the daily lives of college students. From AI-powered writing assistants like ChatGPT to design tools such as Midjourney and idea generators embedded in learning management systems, students increasingly rely on these technologies for both academic and personal creative tasks (Kangiwa et al., 2024; Lin & Chen, 2024). A global survey by the Digital Education Council (2024) found that 86% of college students use AI tools, with 54% using them weekly. While these tools promise enhanced efficiency, personalized support, and assistance in overcoming mental blocks (Li & Qin, 2026), educators and researchers have raised concerns about their potential to undermine students' creative thinking, problem-solving abilities, and academic integrity (Qawqzeh, 2024; Habib et al., 2024).

Creativity, defined as the ability to generate novel, useful, and original ideas, is widely recognized as a critical competency for the 21st century (OECD, 2022; Zheng & Su, 2024a). In higher education, fostering creativity is a central goal across disciplines, from engineering and computer science to the arts and business. However, the proliferation of AI tools that automate or heavily scaffold creative tasks poses a fundamental question: does AI enhance or inhibit students' creativity?

Existing empirical research offers conflicting evidence. Some studies report that AI tools help students overcome initial inertia, generate multiple alternatives, and reduce the cognitive load associated with routine tasks, thereby freeing mental resources for higher-level creative thinking (Wang et al., 2023; Baltà-Salvador et al., 2025). Others warn that excessive reliance on AI leads to cognitive offloading, reduced independent problem-solving, and a homogenization of creative outputs (Aljuaid, 2024; Szmyd & Mitera, 2024). Moreover, most studies have focused on measurable performance outcomes (e.g., essay scores, design quality) rather than on students' subjective experiences and perceptions (Emenike, 2026). Understanding how students themselves perceive and interact with AI during creative

tasks is crucial, because their attitudes and usage patterns ultimately determine whether AI becomes a creative partner or a crutch (Marrone et al., 2022).

To address these gaps, this study adopts a qualitative, exploratory approach grounded in two complementary theoretical frameworks: the Technology Acceptance Model (TAM) (Shahzad et al., 2025) and Cognitive Load Theory (CLT) (Paas & Van Merriënboer, 2020). TAM helps explain why students adopt or reject AI tools based on perceived usefulness and perceived ease of use, while CLT provides a mechanism for understanding how AI may influence cognitive resources available for creative thinking. By integrating these models, we investigated three research questions:

1. How do AI tools influence college students' creative thinking and problem-solving abilities?
2. What are students' perceptions of AI's role in enhancing or inhibiting creative output in academic and non-academic contexts?
3. What attitudes do college students hold toward using AI for creativity-related tasks, and what ethical concerns do they raise?

The findings contribute to the growing literature on AI in education by providing rich, qualitative insights into the students' experiences, and offer actionable recommendations for educators, curriculum designers, and AI developers.

2. Literature Review

2.1 Defining Creativity in Educational Contexts

Creativity in higher education is typically conceptualized as the ability to produce ideas or artifacts that are both original and task-appropriate (Runco & Jaeger, 2012). The OECD's PISA 2022 framework defines creative thinking as "the competence to engage productively in the generation, evaluation and improvement of ideas that can result in original and effective solutions, advances in knowledge, and impactful expressions of imagination" (OECD, 2022, p. 6). This definition emphasizes process (generation, evaluation, improvement) as well as product. In the present study, we adopted this process-oriented view, examining how AI tools interact with each stage of creative thinking.

2.2 AI Tools and Student Creativity: The Double-Edged Sword

A growing body of research has examined the effects of AI tools on student creativity. On the positive side, AI can serve as a "creative companion" that offers alternative perspectives, helps overcome mental blocks, and provides rapid feedback (Wang et al., 2023; Hasibuan & Azizah, 2023). For instance, students using AI for brainstorming reported generating more diverse ideas and feeling less anxious about starting creative tasks (Gohar, 2024). AI writing assistants can help students structure arguments, identify gaps in reasoning, and improve the clarity of expression (Garg, 2024).

Conversely, several studies have identified negative effects. Habib et al. (2024) found that over-reliance on generative AI reduced students' perceived ownership of their work and diminished their willingness to engage in deep, iterative creative processes. Aljuaid (2024) reported that students who heavily depended on AI for academic writing showed less improvement in critical thinking over time compared to those who used AI sparingly. Similarly, Szmyd and Mitera (2024) argued that AI can create a "cognitive laziness" effect, where students outsource not only routine tasks but also higher-order thinking.

Importantly, the impact of AI may depend on contextual factors (Greaves, 2024), such as the type of creative task (academic vs. artistic), the student's prior experience with AI, and the presence of instructional guidance. This complexity justifies a qualitative approach that captures nuanced, context-dependent experiences (Su et al., 2021).

2.3 Theoretical Framework: Integrating TAM and CLT

2.3.1 Technology Acceptance Model (TAM)

TAM, originally proposed by Fred Davis (1989), posits that two key beliefs determine an individual's intention to use a technology: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness refers to the degree to which a person believes that using the technology would enhance their performance, while perceived ease of use refers to the belief that using the technology would be free of effort. In educational settings, TAM has been extensively applied to understand students' adoption of learning technologies (Alyoussef, 2022). Recent studies have used TAM to examine AI tools, finding that both PU and PEOU significantly predict students' willingness to use AI for academic tasks (Pan et al., 2024; Sova et al., 2024).

However, TAM alone does not explain the cognitive mechanisms through which AI affects learning and creativity. For that, we turn to CLT.

2.3.2 Cognitive Load Theory (CLT)

CLT, developed by Sweller (1988) and refined by Paas and Van Merriënboer (2020), distinguishes among three types of

cognitive load: intrinsic (load inherent to the complexity of the material), extraneous (load caused by poor instructional design or distracting elements), and germane (load devoted to schema construction and meaningful learning). Creative tasks typically involve high germane load, as students must integrate prior knowledge with novel associations. If AI tools reduce extraneous load (e.g., by automating formatting or searching for basic information) and help manage intrinsic load (e.g., by breaking down complex problems), more cognitive resources become available for germane processing, thereby enhancing creativity (Chen et al., 2022). Conversely, if AI tools are poorly designed or if students use them passively, they may increase extraneous load or reduce germane load by replacing thinking rather than supporting it.

2.3.3 An Integrated Model

In this study, we propose that students' perceptions of AI's usefulness and ease of use influence their decision to adopt AI for creative tasks (TAM). Once adopted, AI's effect on creativity is mediated by changes in cognitive load: when AI effectively reduces extraneous and intrinsic load, students experience greater cognitive capacity for creative thinking; when AI encourages passive consumption of suggestions, it reduces germane load and inhibits creativity. This integrated framework guides our data collection and analysis.

2.4 Identified Literature Gaps

Despite the growing body of research, several gaps remain. First, most studies are quantitative, focusing on correlations between AI usage frequency and creativity scores, without exploring the qualitative processes underlying these relationships. Second, few studies have examined students' own perceptions of AI's influence on their creative thinking, including both benefits and drawbacks. Third, ethical concerns, such as ownership of AI-generated content, plagiarism, and the authenticity of creative work, have been discussed theoretically but rarely investigated empirically from the student perspective. Fourth, the role of cognitive load in AI-mediated creativity has been modeled theoretically but not qualitatively explored. This study addresses these gaps by providing rich, firsthand accounts from students across multiple disciplines.

3. Methodology

3.1 Research Design

Given the exploratory nature of the research questions and the need to capture subjective experiences, a qualitative research design was adopted (Lösch et al., 2023). Specifically, we used a phenomenological approach to understand how students make sense of their interactions with AI in creative contexts. Semi-structured interviews were chosen because they allow flexibility to probe emergent themes while maintaining a consistent structure across participants.

3.2 Participant Recruitment and Sampling

Purposive sampling was used to select participants who had experience using AI tools for creative tasks. Seven undergraduate students from a university in eastern China were recruited through class announcements and social media. The sample included students from diverse academic disciplines: computer science, psychology, engineering, art & design, business, literature, and mathematics. Participants ranged in age from 19 to 22 years (mean = 20.7); three were male and four were female. Inclusion criteria required that participants had used at least one AI tool (e.g., ChatGPT, DeepSeek, writing assistant, or AI image generator) for creative tasks (writing, design, problem-solving, or idea generation) at least three times in the past month. This heterogeneity allowed us to capture a wide range of perspectives.

3.3 Data Collection

Individual semi-structured interviews were conducted online via Tencent Meeting between March and April 2025. Each interview lasted 30-45 minutes. The interview guide included open-ended questions organized around the research objectives, such as: "Can you describe a specific situation where you used AI to help with a creative task? How did it influence your thinking?" "Do you think AI tools help you think outside the box? Please provide an example." "Have you ever felt that AI restricted your creative output?" "How do you feel about using AI for creativity-related tasks? Do you find it helpful or limiting?" "What ethical concerns, if any, do you have about using AI for schoolwork?" All interviews were audio-recorded with participants' consent and transcribed verbatim. Participants were assigned pseudonyms (P1 to P7) to protect anonymity.

3.4 Data Analysis

Thematic analysis was conducted following the six-phase procedure of Braun and Clarke (2006). Phase 1: Familiarization-both authors read transcripts multiple times and made initial notes. Phase 2: Generating initial codes-we systematically coded meaningful segments of text using inductive coding (e.g., "AI overcomes writer's block," "fear of losing originality," "time-saving benefit"). Phase 3: Searching for themes-we grouped related codes into candidate themes. Phase 4: Reviewing themes-we checked themes against the coded extracts and the entire dataset. Phase 5:

Defining and naming themes-we refined theme labels and wrote definitions. Phase 6: Producing the report-we selected illustrative quotes and wrote the findings section. Inter-coder reliability was ensured by having two researchers independently code two transcripts, compare results, and resolve disagreements through discussion. The final themes were agreed upon by consensus.

3.5 Ethical Considerations

The study received ethical approval from the university's research ethics committee. Informed consent was obtained electronically before each interview. Participants were informed that their participation was voluntary, that they could withdraw at any time without penalty, and that all data would be anonymized. Audio recordings and transcripts were stored on a password-protected computer accessible only to the research team.

4. Findings

Three major themes emerged from the analysis: (1) AI as a double-edged sword for creative thinking and problem-solving; (2) AI's contrasting effects on creative output in academic versus non-academic contexts; and (3) ambivalent attitudes toward AI's role in creativity, including ethical concerns about authenticity and ownership. Each theme is described below with representative quotes.

4.1 Theme 1: AI Enhances Creative Thinking and Problem-Solving, but Over-Dependence Is a Threat

All participants reported that AI tools helped them overcome creative blocks and generate new ideas. For example, P1 (Computer Science, male, 20) stated:

"I utilize AI technology to manage my ideas whenever I become stuck on school assignments. AI tools present alternate paths I might have overlooked, enabling me to surmount creative obstacles in my work."

Similarly, P7 (Mathematics, male, 21) noted:

"I use AI to solve problems that require an alternative approach for difficult tasks. AI provides unique insights which I couldn't have generated independently."

These quotes illustrate the perceived usefulness (TAM's PU) of AI in expanding the range of possible solutions. From a CLT perspective, AI appears to reduce the intrinsic load of complex problems by offering starting points or analogies, allowing students to allocate more cognitive resources to higher-level synthesis.

However, several participants expressed concerns about becoming overly reliant on AI. P5 (Business, male, 22) said:

"My creative thinking often seems subordinate to AI capabilities. Although educational tools provide useful assistance, I'm concerned about losing my ability to think independently."

P2 (Psychology, female, 21) added:

"Sometimes I feel like AI is doing the thinking for me. It's efficient, but then I worry: am I actually learning to be creative, or just learning to use AI?"

These concerns align with the concept of cognitive offloading (Szmyd & Mitera, 2024): when AI consistently provides ready-made suggestions, students may not engage in the germane cognitive load required to develop their own creative schemas. Over time, this could lead to a decline in independent creative thinking.

4.2 Theme 2: AI's Role on Creative Output-Efficiency Gains vs. Originality Constraints

Participants distinguished between academic tasks (essays, research papers, presentations) and non-academic creative projects (digital art, music composition, personal writing). In academic contexts, AI was valued for saving time and improving structure. P7 explained:

"AI enables me to simplify writing assignments by providing frameworks and essential elements and research materials. The use of this technology enables me to save time while focusing on improving my work instead of needing to figure out basic concepts."

P3 (Engineering, male, 22) similarly noted:

"For technical reports, AI helps me generate outlines and even suggests relevant literature. That gives me more time to think about the innovative aspects of my design."

In non-academic creative projects, students appreciated AI as a source of inspiration and a tool for exploration. P2 said:

"The AI tools enable exploration of new ideas which I would not have thought of independently. AI tools provide creative solutions enabling fresh perspectives when working on tasks."

P4 (Art & Design, female, 19) added:

"I use AI to generate initial sketches or color palettes. Sometimes I combine multiple AI suggestions to create something entirely new. It's like having a brainstorming partner who never gets tired."

However, several participants felt that AI could restrict their creative freedom. P1 remarked:

"I feel constrained from pursuing my personal creative journey using these tools. I find the tool provides beneficial assistance but I remain apprehensive about how much it restricts my independent thinking."

P4 also expressed frustration:

"AI-generated designs often look generic. They follow popular trends. If I just take what AI gives me, my work looks like everyone else's."

This tension reflects a core challenge: AI's suggestions are based on patterns in training data, which may lead to homogenization. From a CLT perspective, when students rely on AI-generated templates, they may reduce germane load too much, bypassing the deep processing needed for truly original work.

4.3 Theme 3: Ambivalent Perceptions and Ethical Concerns

Participants held mixed attitudes toward AI in creativity. On the positive side, P3 (Engineering) said:

"AI has the potential to extend creative processes with new tools and fresh viewpoints. Students could experience new thinking perspectives and more adventurous experiments through the influence of AI."

P6 (Literature, female, 20) added:

"When I'm stuck with writer's block, AI can suggest phrases or plot directions. It's like a conversation that gets my own ideas flowing again."

On the negative side, participants worried about authenticity and the blurring of authorship. P2 (Psychology) questioned:

"When I rely on AI for project assistance I wonder if the end results truly represent my efforts."

P1 (Computer Science) noted:

"Since AI presents pre-made solutions that can discourage original thought instead of promoting individual creativity, I sometimes feel like I'm cheating myself out of the learning process."

P4 (Art & Design) expressed a similar sentiment:

"If I use AI to generate half of my artwork, is it still my artwork? Where do I draw the line?"

These ethical concerns extended to academic integrity. P5 said:

"I know classmates who use AI to write entire essays. They get good grades, but they haven't learned anything. It's unfair to those who do their own work."

Participants also worried about the long-term impact on society. P6 reflected:

"If everyone uses AI to think for them, will we lose the ability to be truly creative? Will future generations just be curators of AI output?"

These quotes highlight that students are not passive users; they actively wrestle with the moral and epistemological implications of AI. The findings suggest that many students desire clearer guidelines from their institutions about acceptable AI use.

5. Discussion

5.1 Theoretical Contributions

This study makes several theoretical contributions. First, by integrating TAM and CLT, we provide a more comprehensive model of AI's impact on student creativity. While TAM explains adoption (perceived usefulness and ease of use), CLT explains the cognitive mechanism through which AI affects creative thinking. Our findings suggest that AI is most beneficial when it reduces extraneous load (e.g., by automating routine formatting) and helps manage intrinsic load (e.g., by breaking complex problems into steps) without reducing germane load-the deep processing essential for original idea generation. When students use AI passively (accepting suggestions without critique), germane load decreases, and creativity suffers.

Second, the study extends existing literature by capturing the student voice. Prior quantitative studies have documented correlations but have not revealed the nuanced ways students experience the tension between efficiency and originality. Our themes-AI as a double-edged sword, context-dependent effects, and ethical ambivalence-add richness to the field.

Third, we highlight the ethical dimension, which has been under-explored in empirical research. Students are acutely

aware of issues related to ownership, plagiarism, and authenticity. Their concerns align with recent theoretical work on “AI guilt” (Chan, 2024) and the need for new frameworks of authorship in human-AI collaboration.

5.2 Practical Implications

For educators and curriculum designers, our findings suggest several actionable steps:

Promoting reflective AI use. Instead of banning AI tools outright, educators should teach students how to engage critically with AI-generated suggestions. For example, assignments could require students to document how they modified or rejected AI recommendations. Such practices help maintain germane cognitive load, ensuring that students remain actively involved in the creative process rather than passively accepting AI outputs.

Developing clear ethical guidelines. Institutions need to provide explicit policies that distinguish acceptable from unacceptable AI use in creative assignments. These guidelines should be co-created with students to ensure buy-in and relevance. Clear rules reduce ambiguity, helping students navigate ethical dilemmas related to plagiarism, authorship, and the appropriate scope of AI assistance.

Designing AI literacy training. Many students lack the skills necessary to use AI effectively for creative tasks. Workshops on prompt engineering, evaluating AI outputs, and combining human creativity with AI suggestions could be integrated into orientation programs or disciplinary courses. Such training empowers students to leverage AI as a creative partner rather than a crutch.

Encouraging meta-cognitive reflection. Educators can ask students to keep journals documenting their AI use, reflecting on instances when AI helped or hindered their creative thinking. This practice fosters self-regulation, enabling students to become more conscious and strategic about when and how to involve AI in their creative work.

For AI tool developers, the findings suggest that tools should be designed to support, not supplant, human creativity. Features such as “explain why I suggested this” or “compare your idea with AI’s idea” could encourage active processing rather than passive acceptance. Additionally, tools could include reminders to take breaks from AI to encourage independent thinking.

5.3 Limitations and Future Research Directions

This study has several limitations. First, the sample size ($n=7$) is small and drawn from a single university in China. While qualitative research prioritizes depth over breadth, the findings may not be generalizable to other cultural or educational contexts. Future research should include larger, cross-cultural samples and explore how national culture (e.g., power distance, collectivism) influences AI acceptance in creative tasks. This is particularly relevant given evidence that leader power and hierarchical dynamics can shape organizational behaviors in the Chinese context (Zheng & Su, 2024b).

Second, the study relied on self-reported data, which may be subject to social desirability bias or recall limitations. Future studies could use think-aloud protocols or screen-recording to observe actual AI use in real time.

Third, the cross-sectional design captures perceptions at a single point. Longitudinal studies are needed to examine how prolonged AI use affects creative development over semesters or years. Do students who rely heavily on AI show declines in independent creative thinking, or do they learn to use AI as a springboard? This remains an open question.

Fourth, we did not measure actual creative performance (e.g., via expert ratings of student work). Combining qualitative interviews with quantitative assessments of creativity could provide a more complete picture.

Finally, future research could explore the role of specific AI tool types (e.g., generative text vs. image vs. code) and how discipline-specific contexts shape AI-creativity dynamics.

6. Conclusion

This qualitative study set out to understand how Chinese college students perceive the influence of AI tools on their creativity, guided by an integrated framework of the technology acceptance model and cognitive load theory. The findings lead to several synthesized conclusions.

First, the effect of AI on student creativity is inherently paradoxical. AI tools simultaneously enable and constrain creative thinking. They reduce cognitive barriers and offer novel perspectives, thereby lowering the threshold for generating initial ideas, but they also create a risk of cognitive offloading. When students passively accept AI-generated suggestions, the deep, germane cognitive load required for original ideation is reduced, leading to homogenized outputs and a diminished sense of ownership. This paradox is not absolute but conditional: AI enhances creativity when it is used as a thinking partner that supplements rather than supplants the student’s own mental effort.

Second, the role of AI in creative output is strongly context-dependent. Students perceive AI as more legitimate and helpful in academic settings, where efficiency, structure, and information retrieval are valued, whereas in non-academic

creative pursuits, they worry that AI-generated content lacks authenticity and emotional depth. This contextual distinction suggests that the acceptability and impact of AI cannot be judged uniformly; educators and policymakers must differentiate between task types when formulating guidelines.

Third, students are not uncritical users of AI. They hold ambivalent attitudes, recognizing AI's utility while simultaneously voicing ethical concerns about plagiarism, authorship, fairness, and the long-term erosion of human creativity. Their willingness to follow institutional rules indicates a demand for clear, co-created policies rather than outright prohibition. This finding implies that universities should move beyond reactive stances and proactively engage students in developing ethical frameworks for human-AI collaboration.

Taken together, these conclusions support a nuanced theoretical position: the impact of AI on creativity is mediated by changes in cognitive load, and this mediation is shaped by task context, student engagement style, and institutional guidance. Practically, fostering creativity in the age of AI requires not the elimination of AI tools but the design of educational environments that promote reflective, critical use, thereby preserving and amplifying students' genuine creative capacities. Future longitudinal and cross-cultural research should further examine how these dynamics evolve as AI becomes more deeply embedded in daily academic life.

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Author contributions

Dr. Yaoyi Zheng were responsible for study design and revising. Xiang Ci and Zhian Chen drafted the manuscript. All authors read and approved the final manuscript. Authors contributed equally to the study.

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Data sharing statement

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