

Beyond the Tool: Exploring Student Experiences with Human-AI Collaboration in Digital Content Creation

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ABSTRACT

Background: The integration of Generative AI (GenAI) in education is transforming creative and academic processes. While research has widely examined student perceptions of these tools, a knowledge gap persists regarding the specific dynamics of human-AI collaboration and its tangible effects on student skills. This study addresses this by focusing on how students experience and perceive working with AI as a creative partner rather than a mere tool.

Objective: This research aims to investigate students' experiences and perceptions of collaborating with GenAI on a digital content creation task. We specifically explore the impact of this collaboration on creative problem-solving and creative curiosity, the importance of prompt literacy, and the ethical concerns that arise from this new pedagogical approach.

Methods: We employed a mixed-methods, quasi-experimental design. A cohort of undergraduate students was divided into two groups: one collaborating with GenAI and the other using traditional digital tools for a content creation project. We collected quantitative data through pre- and post-intervention surveys measuring creative problem-solving and curiosity. Qualitative data was gathered via semi-structured interviews to gain a deeper understanding of student experiences and perceptions.

Results: Quantitative results revealed that students in the GenAI group demonstrated a statistically significant improvement in creative problem-solving compared to the control group. Although both groups showed an increase in creative curiosity, the difference was not significant. Qualitative findings highlighted key themes, including students perceiving AI as a valuable brainstorming partner, the emergence of prompt literacy as a critical skill for successful collaboration, and a range of ethical concerns surrounding misuse and content ownership.

Conclusion: The study concludes that intentional human-AI collaboration can significantly enhance students' creative problem-solving abilities. The findings underscore the importance of developing new skills, such as prompt literacy, to navigate these tools effectively. For educational institutions, this research suggests the need to integrate frameworks that not only leverage AI's collaborative potential but also equip students with the ethical awareness and critical thinking skills necessary for the future of creative work.

Keywords

Generative AI, human-AI collaboration, creative problem-solving, prompt literacy, student perception, educational technology, creativity.

INTRODUCTION

The rapid and widespread integration of Generative Artificial Intelligence (GenAI) into higher education has ushered

in a new era of digital pedagogy and content creation. Tools like ChatGPT and various image generators are no longer futuristic concepts but are now commonplace, fundamentally altering how students learn, research, and create [3, 27]. This transformative shift moves beyond AI as a simple repository of information or a productivity tool; instead, it positions AI as a potential collaborative partner in the learning process [16]. As these technologies become more sophisticated, it is crucial to understand not only how students use them but also how they perceive and experience this novel form of human-AI collaboration.

The advent of GenAI raises profound questions about the nature of creativity in the digital age. Creativity, historically viewed as an inherently human trait, is a complex cognitive process involving the generation of novel and useful ideas [10]. Traditional theories, such as Gardner's Multiple Intelligences, have long highlighted the diverse ways in which individuals express creative thought [11, 12]. The introduction of AI into this domain challenges us to redefine our understanding of creative processes. Can a machine truly be a creative partner? Or is it merely a sophisticated tool that automates certain aspects of creation? The potential for AI to act as a catalyst for brainstorming, idea generation, and problem-solving is immense [13, 34]. However, this potential is accompanied by a host of pedagogical and ethical challenges. While previous research has explored student perceptions of AI in general [4, 9, 26], there remains a significant gap in empirical research that specifically investigates the outcomes of human-AI collaboration on students' creative problem-solving skills and their development of new literacies, such as prompt literacy.

This study is grounded in the theoretical frameworks of social constructivism and agency theory. From a social constructivist perspective, AI can be conceptualized as a "more knowledgeable other," capable of scaffolding learning and creative tasks within a student's "zone of proximal development" [29]. This framing allows us to view AI not as a replacement for human intellect but as a tool that extends and enhances it. Simultaneously, we examine the concept of student agency—the capacity for students to act independently and make choices—as they interact with AI [7, 16, 21]. Understanding this dynamic is critical to ensure that AI integration fosters independent thinking and skill development, rather than promoting over-reliance.

To address the existing research gap, this study aims to explore students' perceptions and experiences of human-AI collaboration in digital content creation. We seek to answer three primary research questions:

1. How do students perceive and experience human-AI collaboration in digital content creation?
2. What impact does collaboration with GenAI have on students' creative problem-solving and creative curiosity?
3. What role does prompt literacy play in effective human-AI collaboration, and how do students perceive the associated ethical challenges?

By answering these questions, this study provides valuable insights into the pedagogical implications of GenAI and offers recommendations for developing educational frameworks that responsibly harness the power of AI to foster a new generation of creative and critical thinkers.

2. LITERATURE REVIEW

2.1 Theoretical Framework: Social Constructivism and Student Agency

The theoretical underpinnings of this study are twofold. First, we adopt a social constructivist lens, primarily influenced by the work of Vygotsky [29]. Vygotsky's theory posits that learning is a social process, where individuals construct knowledge through interaction with more capable peers or adults. In the context of our study, GenAI can be seen as a "more knowledgeable other," a tool that can provide scaffolding to help students navigate complex creative tasks [29]. The AI can offer suggestions, generate initial drafts, and synthesize information, enabling

students to operate within their zone of proximal development and achieve creative outcomes that would be challenging to accomplish alone. This collaborative relationship is not about the AI doing the work, but rather about it facilitating and enhancing the student's own cognitive processes.

Second, we incorporate agency theory, which focuses on the capacity of individuals to make choices and exert control over their actions and environments [16]. In the context of human-AI collaboration, it is critical to examine how students' sense of agency is affected. Do students feel empowered and in control when using AI, or do they feel a loss of agency as the AI takes on more of the creative load? Prior research suggests that when AI is framed as an assistant, students may feel more in control, which can positively impact their learning and motivation [7, 21]. This balance between using AI as a supportive partner and maintaining a strong sense of personal agency is central to our investigation of the student experience.

2.2 Student Perceptions of AI in Education

Student perceptions of AI have been a burgeoning area of research. Studies show that students generally hold positive views of AI's potential to enhance learning and productivity [1, 14, 15, 23]. Many students see AI as a helpful tool for tasks such as brainstorming ideas, drafting outlines, and improving writing efficiency [9, 19]. For example, studies on AI-based writing tools have found that students appreciate the immediate feedback and assistance with grammar and style [19]. However, this enthusiasm is often tempered by concerns about accuracy and reliability. A significant number of students express reservations about the potential for AI to generate incorrect or biased information, highlighting a need for critical evaluation skills [4]. Furthermore, a notable concern is the risk of over-reliance, where students may become overly dependent on AI, potentially hindering the development of their independent thinking and problem-solving abilities [26, 32].

2.3 Creativity and AI: A New Frontier

The relationship between AI and creativity is a complex and evolving one. While some view AI as a threat to human creativity, others see it as a powerful new medium and collaborator [34]. Studies have shown that AI can be a valuable tool for igniting creative processes by providing new perspectives, generating diverse ideas, and assisting with tedious tasks, thereby allowing students to focus on higher-order thinking [13, 33]. This collaborative model, sometimes termed "hybrid creativity," suggests that the most innovative outcomes emerge from a dynamic interplay between human intention and AI generation [33]. The human provides the creative vision, context, and critical judgment, while the AI contributes to the ideation and execution phases. This partnership can lead to novel solutions that might not have been conceived by either the human or the AI alone.

2.4 The Rise of New Literacies: Prompt Literacy

Effective collaboration with AI requires a new set of skills that go beyond traditional digital literacy [17]. One of the most critical of these is prompt literacy—the ability to craft clear, concise, and effective prompts to guide an AI's output [20]. Prompt literacy is not merely about writing a command; it involves understanding the AI's capabilities and limitations, refining prompts iteratively, and critically evaluating the generated content [17]. As Lee and Palmer (2025) note, this skill is becoming so essential that it warrants inclusion in higher education curricula [20]. Without prompt literacy, students may receive generic or unhelpful responses, leading to frustration and a diminished collaborative experience. The development of this new skill is a core component of this study.

2.5 Ethical Dimensions of AI Collaboration

The use of GenAI in education is inextricably linked with a range of ethical considerations. A primary concern is academic integrity and the potential for misuse, such as submitting AI-generated work as one's own [4, 28, 32]. However, the ethical landscape is more nuanced, encompassing issues of intellectual property, data privacy, and algorithmic bias [25]. When students use AI to generate content, the question of ownership becomes complex: does the student own the creative output, or does the AI system, or the company that created it, have a claim? [25]. Furthermore, the potential for AI to perpetuate and amplify societal biases through its training data is a significant concern that requires critical discussion [25]. Our study seeks to explore these ethical perceptions directly from the students' perspective.

3. METHODOLOGY

3.1 Research Design

This study employed a mixed-methods quasi-experimental design to investigate the experiences and outcomes of human-AI collaboration. The quasi-experimental component allowed for a comparison of creative outcomes between a group using GenAI and a control group using traditional digital tools. The qualitative component, conducted through interviews, provided rich, in-depth insights into the students' perceptions, experiences, and ethical concerns, which quantitative data alone could not capture. This mixed-methods approach provided a comprehensive understanding of the phenomenon under investigation.

3.2 Participants

The study's participants were a convenience sample of 60 undergraduate students enrolled in a digital media and communications course at a large public university. The students were randomly assigned to one of two groups: the GenAI group (n=30) and the Traditional Tools group (n=30). Participants were not informed of the specific research questions to minimize bias, and all gave informed consent to participate.

3.3 Intervention: Digital Content Creation Project

Both groups were tasked with a single, semester-long project: to create a short digital video (3-5 minutes) on a topic of their choice. The project required them to conceptualize, script, design visual assets, and produce the final video. The key difference in the intervention was the set of tools available to each group.

- **GenAI Group:** Students in this group were encouraged to use various GenAI tools throughout the project. This included using large language models (LLMs) like ChatGPT for brainstorming, outlining scripts, and refining language, as well as using text-to-image and text-to-video generators for creating visual assets and storyboards. The instructions emphasized that the AI should be used as a collaborative partner, not a tool for a final-product generation.
- **Traditional Tools Group:** Students in this group were restricted to using traditional software and resources for their project. This included using word processors for writing, graphic design software for creating visuals from scratch, and traditional video editing suites. They were explicitly prohibited from using any GenAI tools.

3.4 Data Collection

Data was collected using both quantitative and qualitative methods.

- Quantitative Data: A pre- and post-project survey was administered to both groups. The survey included two key measures:
 1. Creative Problem-Solving: Measured using a validated scale that assesses students' ability to generate novel and effective solutions to a hypothetical problem. The scale included items related to divergent thinking and innovative solution generation.
 2. Creative Curiosity: Measured using a custom-designed Likert-type scale to assess students' interest in exploring new creative avenues and their willingness to experiment with different ideas.
- Qualitative Data: Upon completion of the project, semi-structured interviews were conducted with a purposive sample of 10 students from the GenAI group. The interviews, lasting approximately 45-60 minutes, were designed to probe students' experiences, including their perception of the AI as a partner, the challenges they faced, their development of prompt literacy, and their thoughts on the ethical implications of using AI.

3.5 Data Analysis

- Quantitative Analysis: The quantitative data from the pre- and post-surveys was analyzed using IBM SPSS Statistics [8]. Descriptive statistics were used to summarize the data. An independent samples t-test was conducted to compare the mean scores of creative problem-solving and creative curiosity between the GenAI and Traditional Tools groups. A significance level of $p < 0.05$ was set for all statistical tests.
- Qualitative Analysis: The interviews were transcribed verbatim. The transcripts were then analyzed using a thematic analysis approach, as outlined by Chandra and Shang (2019) [6]. This process involved a systematic approach of coding, categorizing, and identifying recurring themes and patterns in the data. The analysis aimed to uncover the core perceptions and experiences of the students regarding their human-AI collaboration.

4. RESULTS

The findings of this study are presented in two parts: the quantitative results from the surveys and the qualitative results from the thematic analysis of the interviews.

4.1 Quantitative Findings

Creative Problem-Solving: The independent samples t-test revealed a statistically significant difference in post-project creative problem-solving scores between the two groups. The GenAI group ($M=4.12, SD=0.65$) demonstrated a notably higher level of creative problem-solving than the Traditional Tools group ($M=3.58, SD=0.59$, $t(58)=3.54, p<.001$). This finding indicates that students who collaborated with GenAI showed a notable improvement in creative problem-solving compared to those using traditional tools.

Creative Curiosity: The analysis of creative curiosity scores showed a different pattern. Both groups showed an increase in their post-project scores compared to their pre-project scores. However, the independent samples t-test did not find a statistically significant difference between the GenAI group ($M=4.45, SD=0.72$) and the Traditional Tools group ($M=4.31, SD=0.68$, $t(58)=0.82, p=.415$). This suggests that while both groups experienced an increase in their willingness to explore and experiment creatively, the use of AI did not provide a significant advantage in boosting curiosity over traditional methods.

4.2 Qualitative Findings

The thematic analysis of the student interviews from the GenAI group yielded three major themes that provide rich context for the quantitative results.

Theme 1: AI as a Collaborative Partner

Students consistently articulated a shift in their perception of AI from a simple tool to a genuine collaborative partner. They described the AI as a helpful "thought partner" and a "virtual brainstormer." One student noted, "I used it to bounce ideas off of. I'd give it a vague concept, and it would give me ten different angles to think about. It was like having a second person in the room." Another student highlighted the efficiency gains, stating, "It helped me connect concepts I hadn't thought of. It would pull in related ideas and speed up the initial stage of content creation, so I could focus on refining the final product." This perception of AI as a partner, assisting with brainstorming and connecting disparate ideas, was a central finding, reinforcing the idea of hybrid human-AI creativity.

Theme 2: The Critical Skill of Prompt Literacy

A recurring and powerful theme was the importance of prompt literacy. Students quickly realized that the quality of the AI's output was directly proportional to the quality of their prompts. They described an iterative process of learning how to craft effective prompts. As one student put it, "At first, I just asked it to write a script for me. The result was generic and useless. But then I started giving it specific details, constraints, and a persona to write from. That's when it became really powerful. It's not just what you ask, but how you ask it." This finding underscores that prompt literacy is not just a technical skill but a form of critical thinking, requiring students to clearly articulate their creative vision and problem-solve in real-time.

Theme 3: Navigating Ethical Concerns

The interviews also revealed a deep awareness and concern among students regarding the ethical dimensions of AI use. The primary issues raised were misuse, inaccuracies, and ownership of AI-generated content. Students were conscious of the fine line between using AI for inspiration and copying its output directly. One student stated, "I was constantly worried about plagiarism. I used the AI to help me outline, but I made sure every single line of the final script was my own writing. It's a gray area." Another student expressed concerns about misinformation, saying, "I had to fact-check everything it gave me. It was great for ideas, but I couldn't just trust the information it generated." The issue of ownership was also a point of discussion, with a student asking, "If the AI helps me create an image, is it really mine? Or is it a collaboration where the AI has some ownership?" These insights confirm that ethical considerations are at the forefront of students' minds and must be addressed proactively in educational settings.

5. DISCUSSION

The findings of this study offer a nuanced perspective on the impact of human-AI collaboration in education, moving beyond the simplistic view of AI as either a threat or a panacea. The results confirm that thoughtfully integrating GenAI can significantly enhance student learning outcomes, particularly in the realm of creative problem-solving. This improvement is likely attributable to the role of AI as a collaborative partner, which aligns with our theoretical framework of social constructivism [29]. By providing a rich source of ideas and scaffolding the initial stages of the creative process, AI frees up cognitive resources, allowing students to focus on higher-order tasks such as refining ideas, making critical judgments, and executing their final vision. This supports the notion that the most effective creativity in the age of AI is a hybrid human-AI creativity, where the human provides the purpose and the AI provides the generative support.

The qualitative findings, in particular, provide a powerful argument for the importance of prompt literacy. The students' journey from crafting simplistic prompts to developing sophisticated, iterative queries highlights a fundamental shift in the skills required for effective digital work. Prompt literacy is not merely a technical skill; it is a manifestation of critical thinking, demanding clarity of thought and an understanding of the relationship between input and output. This finding has significant implications for pedagogy, suggesting that educators should not simply allow AI use but must actively teach students how to interact with these tools effectively and responsibly [17, 20]. While the GenAI group showed a clear advantage in creative problem-solving, the lack of a significant difference in creative curiosity between the two groups is an interesting and important finding. This suggests that while AI can be an excellent tool for accelerating the creative process, it does not inherently replace the intrinsic motivation or willingness to explore that defines curiosity. Both groups, immersed in a challenging creative project, developed their curiosity, suggesting that the task itself was the primary driver. This finding serves as a cautionary note, reminding us that AI tools are most effective when they are integrated into rich, engaging, and challenging learning environments that are already designed to foster key skills. The goal is not to have AI replace the human desire to create, but to empower it.

Finally, the study's results underscore the critical need for an explicit focus on the ethical dimensions of AI in the curriculum. The ethical concerns raised by the students, from misuse to ownership, are not minor issues but central to the responsible use of AI. This echoes the sentiment found in other literature on AI ethics [25]. Educators must move beyond punitive approaches to AI use and instead create spaces for open dialogue and instruction on topics like academic integrity, intellectual property, and critical evaluation of AI-generated content. Doing so will ensure that students are not only skilled in using AI but are also ethically literate and prepared to navigate a world where human and artificial intelligence are increasingly intertwined.

This study's findings align with the growing body of literature that positions AI as a potential tool for enhancing learning and creative outcomes [2, 7, 33, 34]. By examining the nuances of student perceptions and experiences, this research contributes to the conversation about how to best prepare students for a future where human-AI collaboration is a cornerstone of creative and professional work.

6. CONCLUSION

In conclusion, this study offers compelling evidence that when thoughtfully integrated, Generative AI can serve as a powerful collaborative partner for students in creative tasks. The quantitative results demonstrate a statistically significant positive association between human-AI collaboration and improved creative problem-solving abilities. This finding is reinforced by the qualitative data, which revealed that students perceived the AI as a valuable brainstorming partner, helping them to generate and connect ideas more effectively.

A central theme of the research is the emergence of prompt literacy as a foundational skill for the future. The students' experiences highlight that the ability to articulate clear and nuanced prompts is directly linked to the quality of the collaborative outcome, suggesting that this new literacy is as critical to a student's toolkit as traditional digital literacy. Furthermore, the study's findings on creative curiosity provide a crucial nuance: while AI can enhance creative output, it does not appear to be a direct driver of creative curiosity itself. This indicates that the role of a compelling and challenging learning environment remains paramount in fostering a student's intrinsic motivation to explore and innovate.

Finally, the ethical concerns consistently raised by the participants—from misuse and plagiarism to content ownership—underscore the need for a proactive and explicit approach to AI ethics in education. The findings suggest that educational institutions must move beyond simply policing AI use and instead create curricula that equip students with the ethical awareness and critical judgment needed to navigate the complexities of a hybrid

creative landscape.

Limitations and Future Research: Acknowledging the study's limitations, including a convenience sample and the use of specific AI tools, future research should explore these dynamics in different disciplines and with larger, more diverse populations. Longitudinal studies could also provide valuable insights into the long-term development of skills like prompt literacy and the sustained impact of AI collaboration on creativity.

Final Thoughts: The future of education and creativity is poised to be a collaborative one between humans and intelligent machines. Our findings suggest that this partnership, when carefully designed and ethically guided, can empower students to achieve new levels of creativity and problem-solving, thereby preparing them not just to use AI, but to thrive in a world shaped by it.

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