

AI vs Human Creativity: Are Machines Generating Better Ideas?

Fatima Naveed Iftikhar Alam Khan Rafia Muhammad Murtaza Mary Gella Arshiya Subhani

Department of Computing, Bath Spa University Academic Center RAK, UAE

Keywords |

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Abstract |

Aim: The study aims to investigate the role of AI in creative processes. It examines whether AI-generated ideas outperform human-generated ideas in terms of originality, quality and preference. The study's goal is to shed information on AI's ability to function as a creative partner in order to enhance and increase human creativity. It focuses on evaluating and comparing AI-generated ideas to human-generated ideas to evaluate whether AI produces better ideas or not.

Methodology: A mixed method approach was followed, using both qualitative and quantitative methods, i.e, experimentation and an online survey. The experiment initially comprised two groups of students: AI users and Non-AI users. Both groups were asked to generate ideas regarding a single prompt. These ideas, shuffled and combined into a single list was then presented to a third neutral group unknown to which ideas were AI generated and which were not. This group was then asked to vote for the top 5 ideas. Furthermore, an additional quantitative survey was also taken to further studies regarding AI usage and over-reliance concerns.

Findings: The experiment resulted in 52.9% (98) votes were given to AI generated ideas while 47.3% (87) votes were given to ideas generated by humans. Furthermore, the idea that received the most votes was generated by AI. The top 5 most voted concepts have an equal number of AI and Non-AI generated results. Although both received the same top 5 score, it demonstrates that AI can develop creative and original ideas preferred by humans. Whereas the 5 least voted idea list comprised 3 ideas generated by humans and only 2 generated by AI. Additionally, the survey results indicated that approximately 62% of respondents were concerned about generative AI posing long-term risks to human creativity.

Novelty & Implications: This study investigates the role of artificial intelligence (AI) in ideation and creative processes, as well as its collaborative interaction with humans. It studies if AI generates greater ideas than humans and makes comparisons between the two. Unlike earlier research, which has focused on AI's applications in academics, businesses, and other sectors, this study focuses on AI's function in creative ideation. The results indicate AI's positive impact, with AI-generated concepts receiving more votes overall. However, respondents also showed concern about the long-term effects of AI overuse on human creativity. The study suggests a balanced collaboration between AI and human minds to maximise creative potential.

Introduction |

Creativity has long been seen as one of humanity's most admired talents (Doshi & Hauser, 2024), affecting everything from academics, art and literature to scientific discoveries and technological invention. It is frequently regarded as an innate human ability, fuelled by imagination, emotions, and distinct cognitive functions. Until recently, machines were thought of as tools for efficiency rather than creativity. However, with the rapid growth of artificial intelligence (AI), this traditional distinction is being challenged. AI systems that can produce ideas (Doshi & Hauser, 2024), whether in the form of art, writing, or even business solutions, are growing more sophisticated, and the distinction between human and machine-generated creativity is blurring.

The primary question of this research is whether machines generate better ideas than humans. This question originates from the increased use of generative AI models and AI tools in creative processes. According to a recent study, these systems are capable of analysing massive volumes of data, identifying patterns, and producing innovative outputs that can resemble, or may even outperform, human creativity in some circumstances (Castelo et al., 2024).

Previous research has investigated the potential of AI in creative ideation, with many focusing on its ability to produce ideas quickly and effectively (Boussioux et al., 2024). Researchers have continually emphasized AI's ability to generate creative outputs, notably in fields like academics, art, writing, and problem solving. For example, AI systems are frequently complimented for their speed and ability to produce fresh ideas from enormous volumes of data. According to some research, while AI can produce ideas swiftly, its outputs may lack the depth, emotional resonance, and intuitive understanding that human creativity frequently provides (Meinke et al., 2024).

Another study has also focused heavily on the function of artificial intelligence in collaborative creativity. An experiment conducted by (Ashkinaze et al., 2024) concluded that AI ideas did not increase individual creativity, but it did increase collective diversity. Artificial intelligence can be a valuable tool for increasing human creativity by making suggestions, refining ideas, and presenting alternative views (Heyman et al., 2024). This collaborative approach contrasts with the notion that AI may replace human creativity, sparking discussion over whether AI functions

solely as a tool for refining or can independently develop ideas that rival human-generated ones. Some experts believe that AI's creativity is constrained to predefined limits and algorithms (Runco, 2023), whilst others consider AI as an independent source of creativity.

This research looks into AI's role in creative processes. Is AI a tool used by humans to refine their own ideas? Or does it have the required ability to develop totally new and unique ideas on its own? In the era where AI's usage is rapidly increasing, understanding the interaction between human and AI generated ideas is crucial for navigating the future of innovation and creativity.

As generative AI continues to advance, it plays an important role in multiple creative sectors. This study aims to provide insights into how artificial intelligence is reconstructing the frontiers of creativity and innovation. The quality and impact of AI generated ideas will be critically examined. The research hopes to contribute to a better understanding of AI's involvement in creative processes, as well as its ability to enhance or challenge human creativity.

Research Objectives |

The research objectives of the study are as follows:

1. Determine if AI-generated ideas outperform human-generated ideas in terms of creativity, innovation and utility.
2. Examine the quality and preference of AI-generated ideas over human-generated ideas.
3. Investigate AI's role as a creative collaborator for ideation and creative processes, examining if it enhances or challenges human creativity.

Research Questions |

Following are the research questions of the study:

1. Is Artificial Intelligence outperforming humans in terms of creativity and ideation?
2. Can AI be used for generating unique and original ideas?
3. Does AI act as a creative collaborator to enhance human creativity?

4. Do people prefer AI generated ideas over human-generated ideas?

Literature Review |

What is Creativity?

Creativity is the intellectual capacity to develop, innovate, and discover new relationships, entities, and/or unexpected solutions (Wang, 1970). Cognition (the mental process of learning information and understanding through thought, experience, and the senses), creation, and assessment are all components of creative thinking (Georgiev & Danko, 2018).

The literature on creativity and innovation emphasises three critical factors for creating good ideas: having a large number of ideas, developing high-quality ideas, and cultivating ideas with greater variety (Girotra et al 2010).

Creative ideation, refers to the act of developing new ideas or concepts in response to open-ended tasks or queries (Barbot, 2018). It is sometimes seen as the early stage of problem-solving, in which individuals brainstorm and explore an extensive variety of options before refining or applying the most viable ones (Barbot, 2018). This stage, which can be initiated by external stimuli or internal motives, is crucial in fields such as innovation, design, marketing, and any other industry that requires unique solutions (Rojas & Tyler, 2018).

However, the act of ideation is not completely determined by an individual's cognitive capacity. It can also be influenced by outside elements including cooperation, tools, technology, and the environment (Daly et al., 2016). For example, brainstorming sessions or the use of digital tools and platforms frequently affect the ideation process by introducing new stimuli or enabling participant interaction and idea sharing (Paulus & Kenworthy, 2019).

Thus, creative ideation is a multifaceted process that requires both internal and external resources, with a focus on developing new ideas in response to complicated or open-ended challenges (Sosa, 2019).

The Role of AI in Creative Processes

Artificial intelligence (AI) has quickly progressed from a tool for automation to a potent resource for creative thinking. Generative AI, in particular, has received a lot of attention (Peñalvo & Ingelmo, 1970) for its ability to help people create new ideas, designs, and content in a variety of fields, including art, music, literature, academia, and advertising. Unlike standard AI systems that are built to perform certain tasks, generative AI may create material that resembles human creativity by analysing current data and generating new kinds of output based on learnt patterns (Sætra , 2023).

Multiple Generative AI systems, including but not limited to OpenAI's Chat GPT (language-based AI) and DALL·E (image generation AI), have transformed creative sectors by facilitating ideation. ChatGPT, for example, can generate logical and contextually relevant text in response to provided prompts, making it ideal for content creation, copywriting, brainstorming sessions, and even composing poetry or fiction. DALL·E generates visually appealing images based on word descriptions, enabling artists and designers to experiment with new ideas or find inspiration (Puteikis & Mameniškienė, 2024). These aren't the only generative AI tools transforming the digital age. Bard, Gemini, Bing AI, and many other projects are now in development that will completely transform ideation processes (Malakar & Leeladharan, 2024).

When using AI for creativity, it's important to consider its role and place in the process. A significant amount of research focuses on using AI to generate complete works of art. The user provides minimal input to the system, resulting in passive admiration of the creation. Furthermore, AI systems might be viewed as instruments for enhancing human inventiveness (Esling & Devis, 2020).

AI boosts creativity by quickly generating a wide range of ideas, imitating the human process of divergent thinking. Unlike traditional brainstorming, which can be time-consuming, AI-powered applications generate several innovative ideas in seconds. This capability enables users to explore a wide range of alternatives, develop their

ideas, and experiment with multiple approaches more efficiently. By advancing the brainstorming process, AI is a tremendous tool for creativity, allowing individuals to push limits and produce novel solutions that might not have been explored otherwise (Boussioux et al., 2024).

Human vs. AI: Is AI as Creative as Humans?

Despite its potential, the role of artificial intelligence in creativity is still being debated. While earlier study has indicated that the average quality of AI ideas is relatively good, prior research has also pointed to the incapacity of AI-based brainstorming to generate a sufficient dispersion of ideas, limiting novelty and the overall quality of the greatest idea (Meinke et al., 2024).

There is a growing interest in using AI to produce ideas as well as to change and enrich the process of brainstorming in domains such as computer science, entrepreneurship, and psychology, among others (Meinke et al., 2024) yet it sometimes struggles with creating a unique ideas often generating ideas that are too similar to one another, which inherently limits the novelty of the ideas, the variance of the idea quality, and, most importantly, the quality of the best ideas (Girotra et al 2010). This lack of diversity in outputs is due to AI's reliance on pattern recognition and existing datasets rather than independent reasoning or lived experiences (Meinke et al., 2024).

According to some researchers, AI can only generate artificial creativity (Runco, 2023), that too with the help of human input. Unlike human creativity which is generated with intuition, emotions and experience. Thus, calling AI "creative" makes little sense. One approach is to broaden the definition of "artificial intelligence" to include creativity, resulting in the term "artificial creativity" to describe the capabilities of computers. While artificial creativity can be unique and effective, it falls short of certain characteristics of human creativity (Runco, 2023).

Given these constraints, the question of whether AI-generated ideas can outperform human creativity persists. While AI is a wonderful tool for boosting ideation, it has yet to capture the essential

spirit of human uniqueness and innovative thought (Martínez-Miranda & Aldea, 2004).

Cognitive and Psychological Aspects of AI-Assisted Ideation

Artificial intelligence (AI) has rapidly advanced, revolutionising how people engage in intellectual and creative endeavours. AI-assisted writing tools, which can generate complex ideas and provide real-time feedback, have become essential for researchers, authors, and professionals. However, extended use of these technologies tends to have unforeseen cognitive impacts (Youvan, 2025).

With the rapid growth of generative AI, a few issues have arisen, including data security, privacy concerns, and user addiction (Zhou & Zhang, 2024). Users could end up hooked to generative AI, similar to social media addiction (Khan et al., 2021), indicating a psychological state in which people acquire excessive dependence and find it difficult to stop using generative AI systems (Zhou & Zhang, 2024).

Another psychological worry with AI-assisted ideation is its possible impact on cognitive effort and creative involvement. According to studies, when people rely too much on AI-generated ideas, their cognitive effort decreases, resulting in idea fixation—a phenomenon in which people fail to move beyond AI-suggested thoughts (Smith et al., 2020). This reliance on AI can hinder deep thought and creativity, since people may accept AI products without critically refining or challenging them.

AI-assisted tools offer remarkable cognitive involvement (Gelman, 1978). These tools enable real-time interaction with large datasets and complicated concepts by providing rapid information synthesis, content development, and instant feedback. AI technologies facilitate faster ideation and problem-solving compared to traditional research and writing methods. Continuous interaction necessitates ongoing evaluation, decision-making, and adaptability (Youvan, 2025).

Aside from the detrimental psychological and cognitive repercussions of ai-assisted ideation, it can also serve as a cognitive amplifier (Newman et

al., 2025), notably in ideation processes, as well as overcoming mental barriers or igniting creativity.

As AI becomes more ingrained in everyday life, its effect goes beyond discrete tasks to alter key components of human cognition (Newman et al., 2025), lifestyle choices, economic consequences, and social interactions. AI has an active role in determining personal and societal destinies, rather than only as a tool. AI can provide personalised experiences for users, whether for information, entertainment, or assistance. Tailoring interactions can have a significant impact on individual growth, self-perception, and motivation, leading to a more complex web of personal development than traditional technologies (Youvan, 2024).

Eventually, the cognitive and psychological impacts of AI, whether favourable or negative, are entirely dependent on how it is used (Lajoie, 2005) — as an assisting tool or a replacement for human intellect. While Generative AI has the potential to boost creativity and ideation, excessive use may result in a lack of independent problem-solving and ideation capabilities. As AI evolves, it is critical to use it as an enabler rather than a deterrent to human innovation (Lajoie, 2005).

The Future of Creativity and AI: Collaboration or Dependence?

As Generative AI technology advances and grows more advanced, it will eventually transform how humans use computers (Elfa & Dawood, 2023). Additionally, there are ongoing debates about its impact on human activities. AI technologies have been praised for their potential to boost creativity, but also viewed as a threat (More, 2024).

The task ahead is not merely improving AI's capabilities, but also redefining the line between human inventiveness and artificial intelligence. When AI is employed as an augment rather than a crutch, it may propel creativity to new heights. However, excessive reliance on AI threatens stalemate, in which human creativity is limited by algorithmic patterns rather than inspired by raw imagination. While AI cannot replace human creativity, it can help artists explore new ideas and push the frontiers of their craft. Human creativity differs significantly from AI-generated art, which

lacks the experience, emotion, and intuition that come with it (Elfa & Dawood, 2023).

In the end, the future of creativity is not a competition between AI and humans; rather, it is a test of how well we can combine computational power with human ingenuity to uncover concepts that neither could do alone (Vinchon et al., 2023).

Research Methodology |

Research Design

A mixed method approach was implemented for this research. The main methodology was an in-person experiment, which consisted of a qualitative and quantitative approach as it required direct observations and statistical analysis to evaluate if AI-generated ideas outperform human-generated ones. Additionally, an online quantitative survey was also performed to further study AI's impact on creativity.

Participants

Experiment Participants: The experiment was conducted at Bath Spa University RAK. Initially, two groups of students were formed: AI Users and Non-AI Users. The first group generated ideas using AI tools while the second group had no AI assistance and generated ideas completely on their own. Both groups were given the same prompt (Activities for Freshers' Week 2025). Their ideas were combined and shuffled into a single list. A third group, the Evaluators, was then presented with the shuffled list, with no indication of which ideas were AI-generated and which were human-generated. The evaluators were asked to vote for their top 5 most preferred choices.

Survey Participants: An online survey was conducted using google form. A total of 105 respondents participated in the survey. The respondents were generally undergraduate students from various different majors.

Data

Here is a summary of the experiment participants |

Group	Description
AI Users	Generated ideas with the help of AI
Non-AI Users	Generated ideas without using any AI tool
Idea Evaluators	Evaluated the ideas and voted for top 5 ideas from the shuffled list.

Following is the data collected from the conducted experiment |

Total Votes	
Total Votes Collected	185

Total Votes		Percentage
Votes for Human Generated Ideas	87	47.1 %
Votes for AI Generated Ideas	98	52.9 %

5 Most Voted Ideas			
#	Idea	Total Votes	AI or Non-AI
1.	Movie Day: A relaxed movie screening to help freshers unwind and connect.	21	AI
2.	Diverse Food Cuisines: Stalls for cultural dishes from different backgrounds.	17	AI & Non-AI
3.	Esports Tournament: A gaming competition where students compete and collaborate in popular esports games.	14	Non-AI

4.	Games & Prizes: Interactive games with exciting prizes to encourage participation.	13	Non-AI
5.	Scavenger Hunt: Campus wide scavenger hunt to find specific objects, encouraging exploration and teamwork.	13	AI

5 Least Voted Ideas			
#	Idea	Total Votes	AI or Non-AI
1.	Beautiful Decorations: Transforming the campus with vibrant and welcoming decor.	3	Non-AI
2.	Group Dancing: Dance sessions to encourage teamwork and energy-filled interactions.	3	Non-AI
3.	Reverse Teaching: Students take on the role of teachers and deliver short lectures.	3	AI
4.	Talent Show: Showcase for students to demonstrate their talent and skills.	4	Non-AI
5.	Lip Sync Battle: Fun competition where students mime their favorite songs to entertain and compete.	5	AI

Additional data collected from the short quantitative survey |

Here is a summary of the survey respondents |

Response Summary	Count 105	Percentage
Gender		
Male	31	29.5
Female	74	70.5

Current Major		
Foundational Studies	3	2.9
Computing	40	38.1
Business Management	25	23.8
Psychology	16	15.2
Creative Media	2	1.9
Other s(Cyber-Security, Engineering, BTech, etc)	19	18.1

Following is the data collected from the quantitative survey |

Response Summary	Count 105	Percentage
Which AI tools are you familiar with?		
ChatGPT	105	100.0 %
Gemini	54	51.4 %
Bing AI	34	32.4 %
Midjourney	16	15.2 %
DALL-E	21	20 %
Blackbox AI	19	18.1 %
Other (Claude AI, copilot, quillbot, meta ai, etc.,)	8	7.619 %
For what type of tasks do you primarily use generative AI tools?		
Brainstorming Ideas	81	77 %
Outlining Essays/Projects	63	60 %
Generating Visuals/Illustrations	29	27.6 %

Proofreading and Editing	37	35.2 %
Coding Assistance	38	36.2%
Academic Tasks	55	52.4 %
How has the use of AI tools influenced your ability to generate original ideas in academic projects?		
Significantly Improved	33	31.4 %
Somewhat Improved	51	48.6 %
No Impact	12	11.4 %
Somewhat Hindered	9	8.6 %
Significantly Hindered	0	0
Have you noticed a difference in the creativity of your ideas since using these tools?		
Yes, my ideas feel more creative	65	61.9 %
No, my ideas feel very general	17	16.2 %
I felt no difference	23	21.9 %
Do you feel that using AI tools regularly makes you less likely to explore original ideas without assistance?		
Strongly Agree	9	8.6
Agree	32	30.5 %
Neutral	34	32.4 %
Disagree	26	24.8 %
Strongly Disagree	4	3.8 %
Which best describes your creative process with AI?		
AI Enhances My Original Ideas	81	77.1 %

AI Replaces Some of My Original Ideas	16	15.2 %
I Use AI Without Much Modification	8	37.1 %
Do you think regular use of AI tools impacts your ability to generate ideas independently?		
Strongly Agree	17	16.2 %
Agree	31	29.5 %
Neutral	40	38.1 %
Disagree	14	13.3 %
Strongly Disagree	3	2.9 %
Do you believe the use of generative AI poses long-term risks to student creativity?		
Yes	65	61.9 %
No	7	6.7 %
Maybe	33	31.4 %

Findings & Discussion |

The findings from this research provide valuable insights regarding the comparison between AI-generated ideas and Human-generated ideas. The experiment's findings revealed significant intel about AI's role in creative processes.

One of the foremost observations made from the experiment was that AI generated ideas had received a total of 98 votes out of 185 while human-generated ideas received 87 votes, making the percentage score 52.9% and 47.1 respectively. This shows that AI-generated ideas were preferred more than ones generated by humans.

The most voted idea (Movie Day) which had received 21 votes, was suggested by AI.

Furthermore, the five most voted ideas and the five least voted ideas were also identified for further analysis. The 5 most voted concept list consisted of

3 ideas generated by AI and 3 generated by Humans. Although that makes the score equal, it also points to the fact that AI is indeed capable of generating original and creative ideas which are preferred by humans.

The second most voted idea (Diverse Food Cuisines Event) was suggested by both Humans and AI. This suggests that AI can generate ideas as innovative as humans.

Another observation made through the experiment was that the least voted idea list consisted of 3 ideas suggested by humans and 2 suggested by AI indicating that AI-generated ideas slightly outperformed human-generated ones.

The experiment's findings conclude that AI is indeed playing a positive role in the creative ideation processes as its ideas were indeed perceived as innovative and creative. Moreover, it was also noted that although AI-generated ideas received more votes, the top 5 list had an equal number of AI and human-generated ideas. The second most voted idea being suggested by both AI and humans shows that both are capable of generating the same idea as the other. This leads to the conclusion that AI does enhance creativity and would work best as a collaborator rather than a complete replacement for human creativity.

Additionally, the quantitative survey indicated that the majority of the responders, approximately 77%, use generative AI for brainstorming ideas and creative tasks. A large number of responders also identified AI as a tool that enhances their original ideas while also admitting that the use of AI makes their ideas more creative. Only 15% identified it as a tool that completely replaces their own ideas. This shows AI's role as a creative collaborator rather than a replacement for human creativity. Another concern identified through the survey was that the majority of the responders feel that AI might pose long-term risks to human creativity and independent thought processes in the future.

Conclusion |

The study indicates that AI does indeed play a significant role in the ideation and creative processes, enhancing creativity. The research

shows AI's positive role in creativity as it demonstrates its ability to generate innovative solutions which are perceived as creative and are preferred by humans. The conducted experiment revealed that AI-generated ideas were preferred slightly more than human-generated ideas. With the total score of AI being 52.9% and 47.1% for human-generated concepts. This result may point towards the fact that AI is indeed generating better ideas. Nonetheless, the presence of human-generated ideas in the top five idea list, equal to AI-generated ideas highlights that human creativity and AI-generated creativity may be considered equal to some extent.

Another key fact observed from the study is that AI and humans, both have the ability to generate similar ideas, as the second most voted concept was proposed by both AI users and Non-AI users. This concludes the statement that AI serves best as a Creative collaborator rather than a complete replacement to human creativity.

Survey results also indicated that the majority of AI users use AI for brainstorming and creative ideation processes, utilising it to enhance their own ideas rather than replacing their original ideas. Users also showed concern regarding the long-term risks overuse of AI might pose on human creativity and independent thinking.

Finally, it can be concluded that in the current era where AI is continuously advancing, it is indeed playing a vital role in the creative ideation sector. AI provides a diverse range of ideas in the span of just a few seconds. Users admit that using AI makes their ideas feel more creative and innovative. Furthermore, it is suggested to not use AI as a creative tool independently. The study shows that AI serves best as a creative collaborator and a creativity enhancer. The Human-AI collaboration is the ideal approach to maximize the creative potential of human beings.

Limitations and Recommendations |

There were few limitations faced during the duration of this study. The first would be lack of diversity among the participants. Majority of the participants for the experiment and the quantitative survey were students. Having more participants from various other professions and backgrounds would enhance the overall quality and authentication of the research. The study was also conducted within a limited time frame.

It is recommended for future studies to include professionals, artists and individuals from different backgrounds to expand insights. The impact of AI on human creativity should be tracked to provide a deeper understanding regarding the long-term effects. Furthermore, it is advised to raise awareness about balanced use of AI and its utilization as a creative collaborator. The study suggests using AI as a collaborative tool to enhance and maximize the creative potential of human beings.

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