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A Study on the Effect of AI Generators on Creativity among Degree College Students

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Abstract: *This research paper has evaluated the impact of artificial intelligence (AI) on creativity among degree college students with respect to how integration with AI tools is impacting their creative abilities. In the current study, a mixed-method approach is applied by combining quantitative surveys and qualitative interviews to draw data from students of diversified disciplines. The key aspects of creativity that are proposed to be probed are creative confidence, originality, and skills related to problem-solving as an outcome of AI interactions. The results lean toward the implication that AI tools may support creative processes by offering new perspectives and reducing routine tasks but may also increase overreliance and decrease the single individual's creative initiative. The results further deepen the nuanced understanding of the relationship between AI and creativity but give pragmatic advice to educators on how to integrate AI in such a manner as to balance it with strategies for sustaining and enhancing student creativity. The study helps understand the broader implications of AI in an educational setup and how it works to foster innovative thinking.*

Key words: AI, creativity, mixed-method approach.

1. INTRODUCTION:

AI is evolving as the most remarkable revolutionary force in all areas, not even leaving education untouched and, by important integration into modernity. Today, when AI technologies more and more penetrate into human life, they offer unprecedented new opportunities for enhancing education and changing traditional pedagogical ways. All the facets of education under the influence of AI open up to research, and the impact on creativity is the central feature that draws special interest.

It's well recognized that creativity is a very important competency for success in academic studies and consequently in one's whole career. It refers to a person's ability to think divergently, to solve problems innovatively, and to create original ideas. For children who are enrolled in degree colleges, obviously, as a crucial crossing in both their professional careers and also in academics, it is important to cultivate creativity. However, in integrating AI tools, from intelligent tutoring systems to automated content generators and AI-driven research aids, it ultimately calls into question the effect these technologies will have on student creative abilities.

This paper delves into the impact that AI has on the creativity of undergraduate students and how such technological influences determine the processes and resultant products. The study establishes whether AI tools improve or hinder the ability of learners to engage in creative thinking and problem-solving. Originality of thinking, generation of ideas, and viewpoint across several dimensions of creativity were measured.

Comprehension of how AI influences creativity will be crucial in effective educational strategies aiming to harness technology's benefits without calling into question skills in independent creativity. This will provide crucial answers about the kind of influence AI has on creativity and, at the same time, help to acquire evidence-based policy options for the application of AI tools in support and stimulation of teacher creativity among its implementers. Such an introduction therefore lays the foundation for an in-depth inquiry into the role played by AI in shaping creative capabilities among degree college students in modern digitalized settings.

2. Literature Review:

Interest in Artificial Intelligence (AI) technology has blossomed in that community of creativity scholars around the release of ChapGPT in November 2022. New questions in research that arise relate, for example, to the examination of the creativity and generation of ideas produced with the help of generative AI—like produced from human participants—and exploration of audience perceptions of AI-generated vs. human-made art. (Ragot et al., 2020) to ethical and humanistic implications of AI for creativity (Lee, 2022). Runco (2023) referred to a term to coincide artificial creativity for the counterpart term to artificial intelligence and to refer machine based generative outputs.Cropley et a. (2023) analyzed the characteristics of artificial creativity and compared them from the characteristics of human creativity.

In another platform, there was a thread on a forum of creativity scholars on four significant scenarios in what ways AI systems would be experienced Vinchon et al., 2023 (1) human-AI co-creation, where AI becomes a tool (or one of the tools) for human creativity and has a potential to augment it; (2) human only creativity becoming a hallmark of 'true' creativity, similar to the handmade effect in consumer product evaluations (Fuchs et al., 2015) or the authenticity effect in judgements of art (Locher et al., 2015; Newman & Bloom, 2012; (3) plagiarism concerns; (4) AI reducing human creativity in some people by weakening motivation and self-concept of creativity. Each of these scenarios is likely to spur their own lines of research. For example, creativity researchers might conduct studies to contrast who would be likely to get discouraged and who would be inspired by AI systems. This is much like the creative mortification effect (Beghetto, 2014 In other words, we can speculate that those who seem to be having negative effects from interacting with generative AI are the ones having low creative self-efficacy, relatively less valuing creativity, and greater difficulty in regulating emotions such as anxiety and frustration while being creative.

We focus in this paper specifically on a scenario of co-creation or use of AI as aid to creativity. We define AI in a broad sense to encompass any computer programs undertaking tasks that are conventionally conceived as demanding human intelligence. AI technologies include narrow (or weak) intelligence, which is specialized for the performance of a specific kind of task in areas like self-driving cars, and broad or general intelligence (which is still theoretical, but tools like ChatGPT might be approaching it (Bubeck et al., 2023;Wang & Siau, 2019).

When we talk about AI as a creative tool, we establish an analogy with the other types of tools that served as a way to augment human creativity. The invention of the photographic technology, for instance, established a new art form (Hertzmann, 2018) even though the resistance remained. In computing, the invention made it possible to develop new statistical methods and to apply them throughout science. Indeed, when Spearman (1904) and strictly defined by Thurstone, 1935increases of computational power made this possible to broaden the application of those methods and caused development of new ones (e.g., structural equation modeling, latent curve models (Cudeck & MacCallum, 2007).

Those methods were applied in situ broadly in their turn in the scientific research, such as identification of five broad factors of personality (Wiggins & Trapnell, 1997) of course, history will have a lot to borrow from and inform us by analogy, but either way, one has to look above and through the ways these new emerging AI technologies can serve human creativity in particular.

3. Methodology

The current study has adopted a mixed method approach to analyzing AI's impact on creativity using a sample of undergraduate college students. The study has combined both quantitative and qualitative methods of data collection, and the methodology depicts how the influence of AI on creative processes and its outcomes has an in-depth analysis.

This study will adhere to a sequential explanatory design where the quantitative approach will take priority in data collection, followed by qualitative data collection. The approach will ensure an in-depth analysis of the effect of AI on creativity and further elaborate the underlying mechanisms in follow-up qualitative data.

In this study the sample size of 385 students of degree colleges of all disciplines with stratified convenient random sampling method was adopted to collect the responses.

A survey instrument was developed and tested for reliability with Cronbach Alpha test. Figure 3.1 shows the detailed steps adopted in this work.

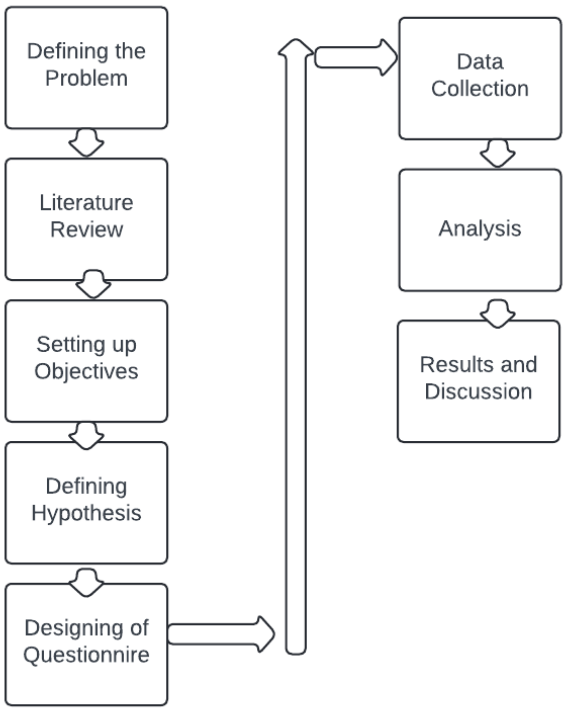

Figure 3.1: Methodology adopted

4. Data Collection:

A survey instrument with 15 questions were designed and tested for reliability with revision of the survey instrument, the Cronbach's alpha was 0.81, which concludes the questionnaire used are reliable. With this questionnaire the responses were collected from 385 students of who are studying in different degree courses.

Table 4.1 and figure 4.1 shows the distribution of course wise students data.

Table 4.1: Distribution of Respondents

Course	Boys	Girls	Total
Arts	20	15	35
Commerce	45	29	74
Science	35	70	105
Management	48	20	68
Engineering	45	58	103
Total	193	192	385

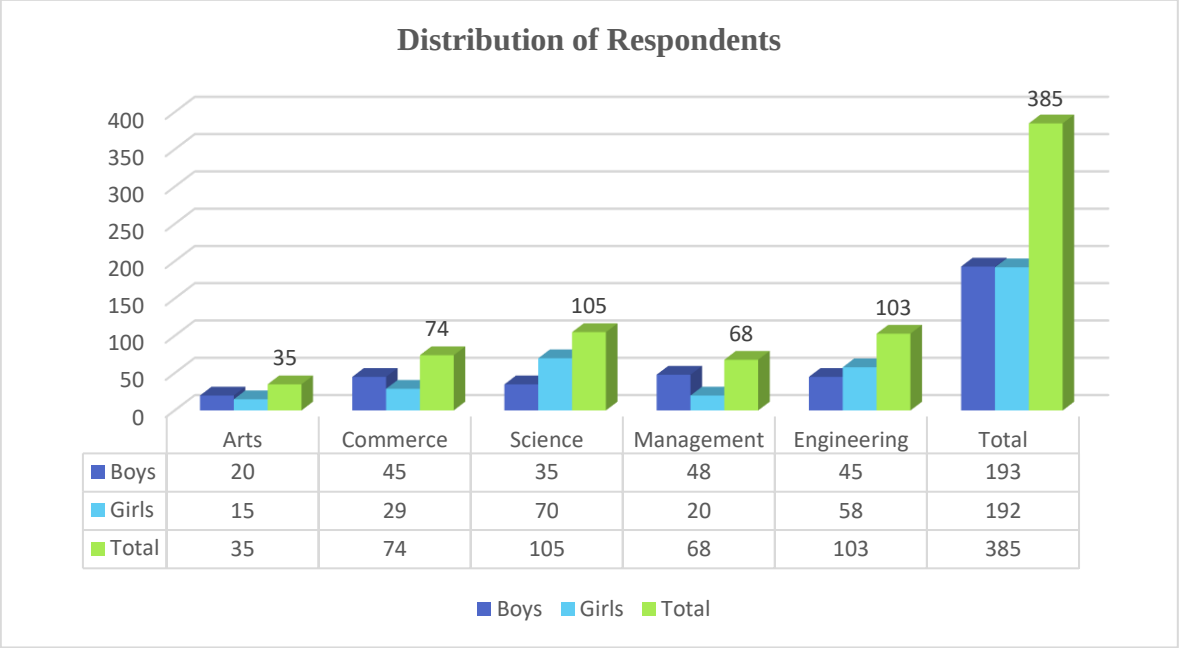

Figure 4.1: Distribution of Respondents Course wise

5. Results and Discussion:

A hypothesis was framed to test whether AI is affecting student's creativity. The null (H_o) and alternate (H_1) hypotheses are shows in the table 5.1

Table 5.1 Null (H_o) and alternate (H_1) hypotheses

Null Hypothesis (H_o)	AI does not decrease the creativity of the students
Alternate Hypothesis (H_1)	AI decreases the creativity of the students

Dr. Arsham's statistics site was used to find the sample mean and variance for the responses gathered the same is shown in the table 5.2.

Table 5.2: Sample mean and variances

Sample Size(i)	385	385	385	385	385	385	385	385		
Sample Mean(i)	4.6442	4.6000	4.6104	4.4883	4.3558	1.6026	4.5584	4.4701		
Sample Variance(i)	.266	.350	.311	.376	.688	.422	.544	.437		

The results obtained with Dr.Arsham's statistics site were used to find F-statistics and corresponding p values. Table 5.3 shows the results computed using same site.

Table 5.3: Results from Dr. Arsham's statistics site

Sample Size(i)	385	385	385	385	385	385	385	385		
Sample Mean(i)	4.6442	4.6000	4.6104	4.4883	4.3558	1.6026	4.5584	4.4701		
Sample Variance(i)	.266	.350	.311	.376	.688	.422	.544	.437		

CALCULATE: TEST FOR EQUALITY OF MEANS | CLEAR

Variation Between	416.454371	**Variation Within**	0.42425
F-Statistic	981.624917	**P-Value**	0.0005

Conclusion

Very strong evidence against the null hypothesis

The p-value obtained is 0.0005 which is less than 0.05. From this it is evident that the AI generators affects the creativity of the students who are studying at degree level.

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