Frequent ChatGPT Users: Are They More or Less Creative?

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Abstract

The rise of ChatGPT has transformed student workflows, raising concerns about overdependence and its impact on creativity. This research aimed to determine if there is a difference between the creativity levels of students who frequently utilize ChatGPT compared to those who rarely use it. It employed a purposive sampling technique to collect primary data and found no major distinction in creativity levels between the two groups. However, a positive correlation between perceived usefulness and usage frequency was identified. Demographic disparities with respect to gender and nationality in ChatGPT usage were also discovered. While this study depended solely on self-reported measures (Creative Personality Inventory and the Technology Acceptance Model), which can sometimes be influenced by personal biases, it contributes to the ongoing debate on AI's influence on student creativity and provides a foundation for further research in the education sector.

Keywords: ChatGPT, Student Creativity, AI influence, AI in Education

1. Introduction

1.1 Background of Study

AI has come a long way since the time when manually operated computers were first introduced. Today, it is a field that draws on and combines knowledge from many different disciplines.(Haenlein & Kaplan, 2019). The objective is to create machines that are capable of imitating human intelligence (Chowdhary, 2020). AI is not a single area of study, but rather a collection of different technical fields working together. Some examples include machine learning and natural language processing. (Lund et al., 2023). These are rapidly advancing fields with a major impact on a wide range of applications (Fosso Wamba et al., 2021).

Recently, AI has grown to be a part of the day-to-day routine due to the proliferation of processing capabilities and, most importantly, the use of intelligent agents (Adamopoulou & Moussiades, 2020). Chatbots are among the most popular types of intelligent agents. They can reply to a conversation by either typing a message or speaking like humans do (Brandtzaeg & Følstad, 2017). These systems are built using natural language processing methods that allow them to understand and interpret the language humans use.(Khanna et al., 2015). Adolescents and young adults are increasingly drawn to these chatbots in recent years, as they offer a fast and personalized way to communicate through short messages (Lokman & Ameedeen, 2019).

In the wake of these chatbots, OpenAI has made profound advancements in the field of AI with GPT-3, a powerful language model. Complementing this breakthrough, OpenAI introduced ChatGPT, further enriching the landscape of conversational AI technologies (Lund et al., 2023). ChatGPT is designed to interpret and understand what individuals say and respond via text in a way that sounds like a real person (Dale, 2021). GPT is unique among big language models because of its extraordinary size and the massive volume of data that was utilized in its training. It is powered by an algorithm that taps into the entirety of the Internet, making it one of the world's most extensive language models. (Floridi & Chiriatti, 2020). This powerful tool is crafted to undertake a multitude of language-based tasks, including but not limited to generating texts, responding to questions, and even translating languages (Lund et al., 2023).

An increasing number of students are using ChatGPT these days to handle different tasks (Strzelecki, 2024). According to a Pew Research Center survey, approximately 20% of teens who are familiar with ChatGPT have used it for their school assignments. Furthermore, the survey also found that around 1-in-5 teens think that it is okay to use ChatGPT directly to complete assignments like essays or solve math problems (Gottfried, 2023).

1.2 Statement of Problem

Students who use ChatGPT have been observed to have the perception that the tasks at hand are simpler and require less mental effort (Urban et al., 2024). They have been able to benefit from its ability to assist in a variety of activities, including but not limited to brainstorming, content creation, writing collaboration, and even problem solving (Padhiyar & Modha, 2024). Moreover, the importance of ChatGPT's potential in academia cannot be overstated. It can serve as an immediate support system for students (Ayman et al., 2023).

There are plenty of other aspects that have contributed to the widespread adoption of ChatGPT among students. For example, ChatGPT can assist them in their search for

information by providing prompt responses to questions they may have. Their ability to perceive and process information more effectively can be improved as a result of this (Brovko Anastasiya, 2024). Furthermore, students who relied on ChatGPT for academic assistance reported an improvement in the quality of their work (Shehri et al., 2023).

However, outsourcing tasks to artificial intelligence models like ChatGPT may cause them to miss out on the opportunity to engage in cognitive processes that are crucial for fostering critical thinking and creativity. Additionally, the convenience that ChatGPT provides may result in a reduction in the amount of effort and mental engagement that is required from students. There is a possibility that this will lead to a reduction in the development of essential skills, including decreasing levels of creativity. (Peters et al., 2023).

Therefore, this study aims to answer the following research questions:

1.3 Research Questions

1.3.1 Main Questions

1. Is there a significant difference in creativity levels between students who frequently use ChatGPT compared to those who rarely use it?
2. Is there a significant relationship between ChatGPT usage and creativity levels of students?

1.3.2 Sub Questions

1. How does perceived usefulness of ChatGPT relate to the usage of platform among students?
2. Is there a significant difference in ChatGPT usage between males and females?
3. Does the usage of ChatGPT differ between students from India and New Zealand?
4. Is there a significant difference in the frequency of ChatGPT usage between students aged 18 to 20 and those aged 21 to 25?

1.4 Research Hypothesis

1. **H0:** There is no significant distribution of creativity levels among students who always use ChatGPT and students who rarely use ChatGPT.
   H1: There is a significant distribution of creativity levels among students who always use ChatGPT and students who rarely use ChatGPT.
2. **H0:** There is no significant relationship between ChatGPT usage and levels of creativity.

H2: There is a significant relationship between ChatGPT usage and levels of creativity.

3. **H0:** There is no significant relationship between perceived ChatGPT usefulness and ChatGPT usage.
   H3: There is a significant relationship between perceived ChatGPT usefulness and ChatGPT usage.

4. **H0:** There is no significant difference in the distribution of ChatGPT usage among males and females.
   H4: There is significant difference in the distribution of ChatGPT usage among males and females.

5. **H0:** There is no significant difference in the distribution of ChatGPT usage among students living in India and New Zealand.
   H5: There is significant difference in the distribution of ChatGPT usage among students living in India and New Zealand.

6. **H0:** There is no significant difference in the distribution of ChatGPT usage between the age group of 18 to 20 and that of 21 to 25.
   H6: There is significant difference in the distribution of ChatGPT usage between the age group of 18 to 20 and that of 21 to 25

2. Literature Review

One of the hypotheses put forward by Zhong and Zheng is that AI increases the creativity of students (Zhong & Zheng, 2023). Building upon this notion, further research has demonstrated that ChatGPT in particular can act as a helpful assistant that can assist pupils in improving their creativity, along with their fluency and originality in the creative writing tasks they are assigned (Vicente-Yagüe-Jara et al., 2023). Moreover, Brovko has called attention to the contribution that ChatGPT makes to the development of inventiveness in undergraduates across various disciplines by facilitating activities related to the perception and processing of information (Brovko Anastasiya, 2024).

Subsequently, an experimental study was carried out by Essel to investigate the impact that using ChatGPT has on the learners' ability to think critically, creatively, and reflectively. In the study, students were divided into two groups: an experimental group that participated in class activities using ChatGPT, and a control group that did not. It was found that students in the experimental group showed increased creative thinking abilities (Essel et al., 2024).

In a similar manner, Urban utilized a "Product Improvement Task," in which students were tasked with enhancing a product in ways that were both unique and beneficial. The

experiment compared the performance of students using ChatGPT with those who did not. Solutions from students who used ChatGPT were judged to be of higher standard, better elaborated, and more original compared to those who did not use ChatGPT (Urban et al., 2024). Additionally, Mahapatra employed ChatGPT as a feedback tool in his experiment and proved that it has a significant positive impact on ESL (English as a Second Language) students' academic writing skills (Mahapatra, 2024).

Despite its potential benefits, several studies have shown that ChatGPT may actually hinder creativity. To begin with, Liu discovered that students who used ChatGPT for creative activities came up with more innovative and beneficial ideas than those who did not. However, the thoughts were more homogenized, and this homogeneity impact upheld even after the use of ChatGPT was discontinued (Liu et al., 2024). Similarly, Fügener found that, although AI assistance may improve human decision-making accuracy, it also decreases distinctive human expertise, causing them to act more like "Borgs," with high individual performance but no human personality (Fügener et al., 2021).

Moreover, concerns about cognitive atrophy were also raised by Sætra. He drew a parallel to how calculators have impacted mental arithmetic skills, suggesting that tools like ChatGPT might similarly affect writing and creative abilities of students if relied upon too heavily (Sætra, 2023). In addition to that, Shehri suggested that overreliance on the technology can lead to problems in one's critical thinking and creative writing abilities (Shehri et al., 2023).

Furthermore, Tanvir demonstrated that plagiarism facilitated by ChatGPT can also damage the creativity of students. This negative consequence derives from the possibility of pupils being totally dependent on AI-generated material, which impedes the development of their distinctive imaginative capacities (Tanvir et al., 2023). Besides, using ChatGPT does not always result in the creation of unique and relevant material. Niloy discovered that, although ChatGPT may be a valuable collaborator, its sole usage resulted in poorer results on measures of originality for human writings (Niloy et al., 2024).

Saylam also addresses worries over ChatGPT's detrimental effects on pupils' capacity for critical thinking. This worry is supported by research from the Reboot Foundation, which indicates that 86% of pupils lack critical thinking abilities. According to him students avoid the cognitive processes needed in critical thinking when they use AI to find answers to questions or work through issues that they would normally need to deal with critically. Further, Saylam and his team cite a parallel poll that suggested that students were aware that using AI exclusively might interfere with their ability to study, yet they were nevertheless tempted to utilize the technology. (Saylam et al., 2023). Moreover, students in the study conducted by Smolansky felt that ChatGPT reduced creativity and

that humans should not be asked to act as secretaries to machines (Smolansky et al., 2023).

On top of that, Mahama said that ChatGPT can not be as creative as humans. Depending too much on AI for creative things might stop people from using their own creativity (Mahama et al., 2023). Additionally, Abbas showed proof that excessive use of ChatGPT can harm how students behave in school and how well they think (Abbas et al., 2024). Likewise, Zirar talked about the dangers of students overly depending on language models without carefully thinking about the information these tools give (Zirar, 2023).

While there is considerable evidence suggesting that ChatGPT can enhance certain aspects of creativity, an increasing number of studies are suggesting potential drawbacks and concerns associated with its extensive use. It is apparent that the relationship between ChatGPT usage and creativity levels of students is complex and highlights the need for further research to understand its multifaceted nature.

3. Research Design

3.1 Variables

3.1.1 ChatGPT Usage Frequency (Independent Variable):

This variable refers to how often students use ChatGPT for various tasks. For the purpose of this study, ChatGPT usage frequency is measured based on participants' self-reported utilization levels of ChatGPT using a demographic question.

3.1.2 Levels of Creativity (Dependent Variable):

This variable refers to creative abilities of students. In this study, creativity is assessed using the Creative Personality Inventory (CPI), an 18-item self-report Likert scale.

3.1.3 Perceived ChatGPT Usefulness (Dependent Variable):

This variable refers to participants' subjective perceptions of the usefulness of ChatGPT in assisting them with various tasks. It is evaluated using the perceived usefulness construct of the TAM model.

3.2 Tools

3.2.1 Measurement of ChatGPT Usage (1-item self-report Likert scale):

The utilization of ChatGPT was assessed through a demographic question designed to gauge the frequency of its usage among participants. The question presented to the participants was as follows:

"Rate the extent to which you use ChatGPT."
1: Never
2: Rarely
3: Sometimes
4: Often
5: Always
Participants were asked to select one of the five response options that best represented their frequency of using ChatGPT.

3.2.2 CPI: Creative Personality Inventory (18-item self-report Likert scale):

The Creative Personality Inventory (CPI) consists of 18 items that are rated on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The items are designed to measure various aspects of creativity, such as openness to experience, imagination, and self-expression. It has a reliability coefficient of 0.911, which is within the acceptable range of 0.80 to 0.95. The validity of the CPI has been established through correlations with external criteria, such as creativity tests and creative achievements, which fall in the range of 0.2 to 0.5. For a detailed list of CPI items, see Appendix 1.

3.2.3 TAM: Technology Acceptance Model (6-item self-report Likert scale):

The Technology Acceptance Model (TAM) is a key concept that helps grasp the adoption of technology by the users. It consists of two main components: perceived usefulness and perceived ease of use. In terms of validity, TAM has been found to have high construct validity, with factor loadings ranging from 0.77 to 0.93 for perceived usefulness and 0.71 to 0.91 for perceived ease of use. This research incorporated the first component, perceived usefulness, which is a self-report Likert scale consisting of six items. For a detailed list of TAM items, see Appendix 2.

3.3 Procedure

As mentioned, this study used two questionnaires: the Technology Acceptance Model (6 items) and the Creative Personality Inventory (18 items). ChatGPT usage was measured through a demographic question asking participants to rate the extent to which they utilize ChatGPT. The question offered five answer choices on a scale.

In the final stage of data collection, a 31-question survey was distributed through Google Forms. It included demographic information, along with a clear explanation of the study's purpose and participants' consent. The research was explained to them and they were invited to participate voluntarily. Moreover, participants explicitly agreed to partake in this study by ticking the designated consent box in the Google form, understanding that the information provided would be utilized solely for research purposes. This ensured a

pool of participants who understood the study and freely volunteered.

Data collection for the survey took place over a one-week period from March 18, 2024, to March 25, 2024. Once collected, the information was analyzed with the help of SPSS, a statistical software program.

3.4 Sample

Instead of random selection, this study carefully chose participants who matched the desired qualities outlined in the inclusion criteria.

Inclusion criteria:

1. Students within the age range of 18 to 25 years.
2. Students who are currently enrolled as college students.
3. Students residing in either India or New Zealand.

Exclusion criteria:

1. Students below 18 or above 25 years of age.
2. Students who are not currently enrolled as college students.
3. Students living in other countries apart from India and New Zealand.

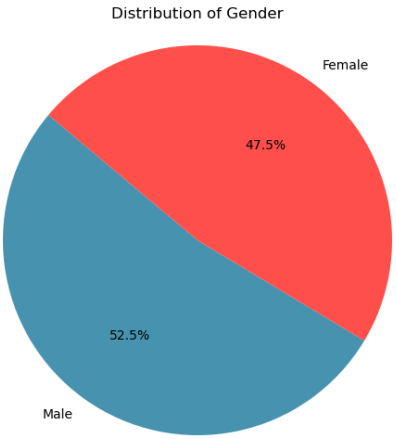
By deliberately selecting participants based on specific demographic criteria, the study was able to gather high-quality data that was directly relevant to answer the research questions. A total of 120 participants, comprising 63 males and 57 females, were involved. They were segmented into two age groups: 18-20 years old (n=60) and 21-25 years old (n=60). Participants represented two nationalities: New Zealand (n=56) and India (n=64).

4. Data Analysis

4.1 Frequency Distribution of Gender

Gender		
	Frequency	Percent
Male	63	52.5
Female	57	47.5
Total	120	100

(a)



(b)

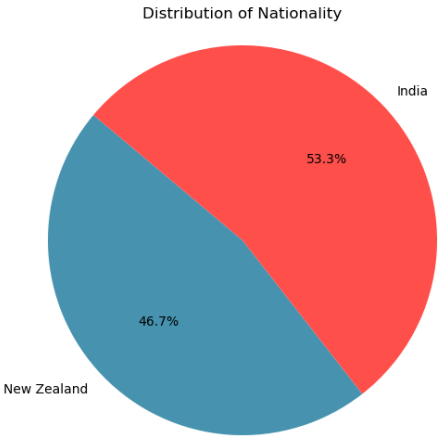
Figure 1: Tabular and Graphical Depiction of Gender Distribution

Figure 1 depicts that the sample population is divided nearly evenly between genders. There are 63 male students, making up 52.5% of the sample, and 57 female students, comprising the remaining 47.5%.

4.2 Frequency Distribution of Nationality

Nationality		
	Frequency	Percent
New Zealand	56	46.7
India	64	53.3
Total	120	100

(a)



(b)

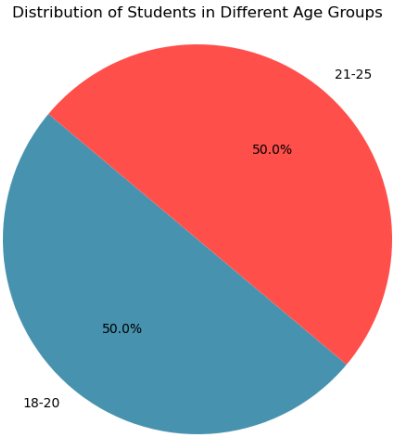
Figure 2: Tabular and Graphical Depiction of Nationality Distribution

Figure 2 illustrates slightly higher proportion of students from India compared to those from New Zealand. Of the total sample size of 120 students, 64 are from India, making up 53.3% of the population, while 56 students are from New Zealand, representing 46.7% of the total.

4.3 Frequency Distribution of Age

Age		
	Frequency	Percent
18 to 20	60	50.0
21 to 25	60	50.0
Total	120	100

(a)



(b)

Figure 3: Tabular and Graphical Depiction of Age Distribution

Figure 3 describes that there is a balanced distribution of students across two age groups: 18-20 and 21-25 years old. Each group comprises 60 students, representing exactly 50% of the total student population.

4.4 Test of Normality

Tests of Normality							
	chatgpt_use	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
perceived_usefulness	1	0.267	16	0.003	0.843	16	0.011
	2	0.168	32	0.022	0.887	32	0.003
	3	0.168	33	0.019	0.952	33	0.154
	4	0.186	28	0.014	0.925	28	0.046
	5	0.31	11	0.004	0.72	11	0.001
creativity_levels	1	0.259	16	0.005	0.765	16	0.001
	2	0.125	32	.200*	0.966	32	0.401
	3	0.173	33	0.013	0.875	33	0.001
	4	0.096	28	.200*	0.953	28	0.241
	5	0.216	11	0.162	0.861	11	0.06

The results of the normality tests, particularly the Shapiro-Wilk test, indicate that the data for both "perceived_usefulness" and "creativity_levels" likely do not come from a normal distribution. This means that the data points are probably not clustered around

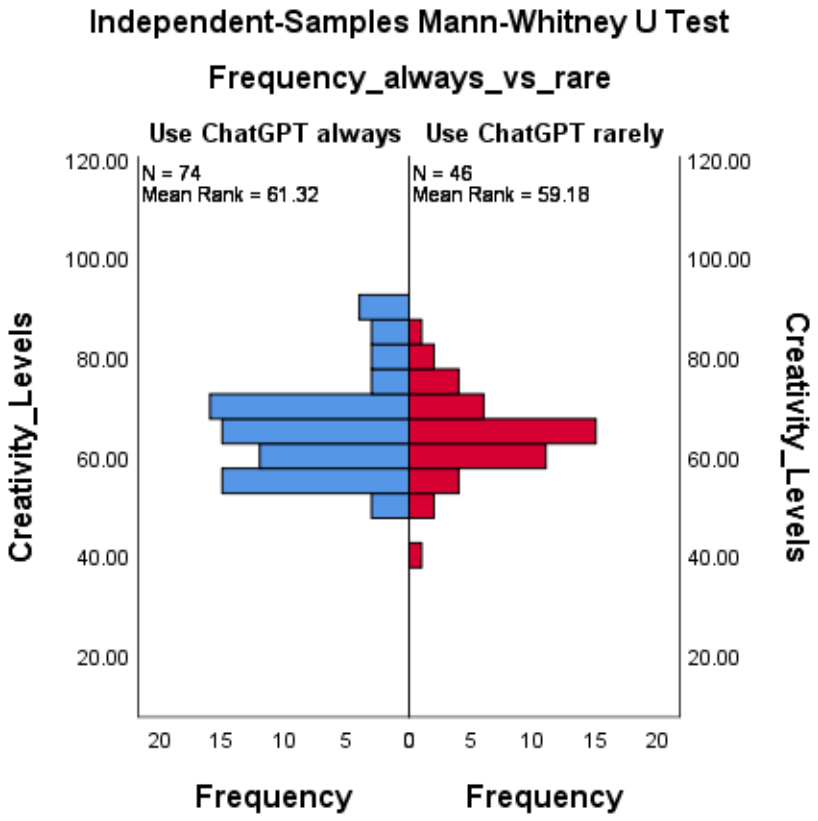
a central value and instead might be skewed or have unexpected patterns. Because the data did not follow a normal bell curve, non-parametric tests are used throughout the study.

4.5 Interpretation of Hypothesis 1

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
The distribution of creativity_levels is the same across categories of frequency_always_vs_rare.	Independent-Samples Mann-Whitney U Test	0.744	Retain the null hypothesis.
The significance level is .050.			

The Mann-Whitney U test yielded a Mann-Whitney U statistic of 1762.500, with a standardized test statistic of 0.327 and an asymptotic two-sided significance of 0.744. Since 0.744 is much higher than the significance level of 0.05, there is not enough evidence to reject the null hypothesis. In simpler terms, the data does not show a statistically significant difference in creativity levels between the frequent and rare user groups. There might be a slight difference as indicated by the test statistic, but it is not strong enough to conclude with confidence that using ChatGPT frequently impacts creativity.

Independent-Samples Mann-Whitney U Test Summary	
Total N	120
Mann-Whitney U	1762.500
Wilcoxon W	4537.500
Test Statistic	1762.500
Standard Error	185.099
Standardized Test Statistic	0.327
Asymptotic Sig.(2-sided test)	0.744



The graphical representation supports this conclusion by not showing a stark difference in the distribution of "Creativity_Levels" between the two groups.

4.6 Interpretation of Hypothesis 2

Correlations				
			chatgpt_use	creativity_levels
Spearman's rho	chatgpt_use	Correlation Coefficient	1	0.051
		Sig. (2-tailed)	.	0.581
		N	120	120
	creativity_levels	Correlation Coefficient	0.051	1
		Sig. (2-tailed)	0.581	.
		N	120	120

The analysis of the correlation between ChatGPT usage frequency and levels of creativity measured by Spearman's rho indicates a very weak positive correlation with a coefficient of 0.051. This suggests that there is a slight tendency for higher use of ChatGPT to be associated with higher levels of creativity; however, the relationship is not strong. That

is because the statistical test produced a result that far exceeds the standard threshold for claiming a significant relationship. So, the study cannot confidently assert that there is a meaningful relationship between the two variables.

4.7 Interpretation of Hypothesis 3

Correlations				
			perceived_usefulness	chatgpt_use
Spearman's rho	perceived_usefulness	Correlation Coefficient	1	.588**
		Sig. (2-tailed)	.	0
		N	120	120
	chatgpt_use	Correlation Coefficient	.588**	1
		Sig. (2-tailed)	0	.
		N	120	120
**. Correlation is significant at the 0.01 level (2-tailed).				

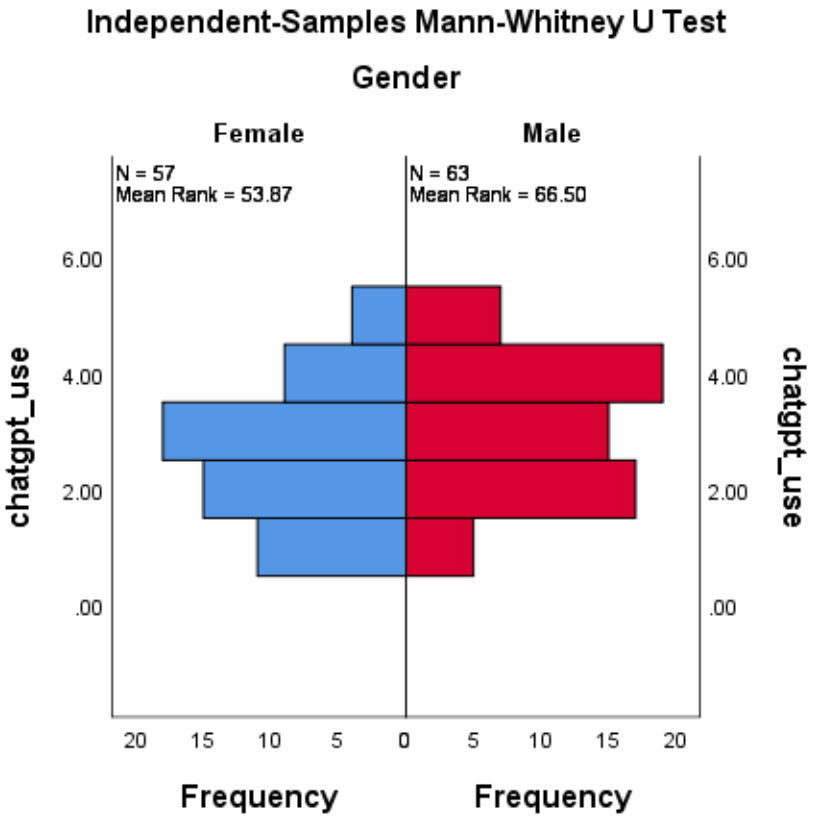
The analysis of the correlation between perceived usefulness and ChatGPT usage frequency assessed through Spearman's rho reveals a moderately positive correlation with a coefficient of 0.588. Moreover, the correlation is statistically significant at the 0.01 level. This connection is statistically reliable, meaning that it is very unlikely to be due to chance. This suggests that as ChatGPT's perceived usefulness increases, so does its usage.

4.8 Interpretation of Hypothesis 4

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
The distribution of chatgpt_use is the same across categories of gender.	Independent-Samples Mann -Whitney U Test	0.041	Reject the null hypothesis.
The significance level is .050.			

The Mann-Whitney U test yielded a Mann-Whitney U statistic of 1417.500 and a standardized test statistic of -2.044. The asymptotic significance from the two-sided test is .041, which is below the conventional significance level of .050. This result shows a clear difference in how often male and female students use ChatGPT, and this difference is unlikely to be random.

Independent-Samples Mann-Whitney U Test Summary	
Total N	120
Mann-Whitney U	1417.5
Wilcoxon W	3070.5
Test Statistic	1417.5
Standard Error	184.928
Standardized Test Statistic	-2.044
Asymptotic Sig.(2-sided test)	0.041



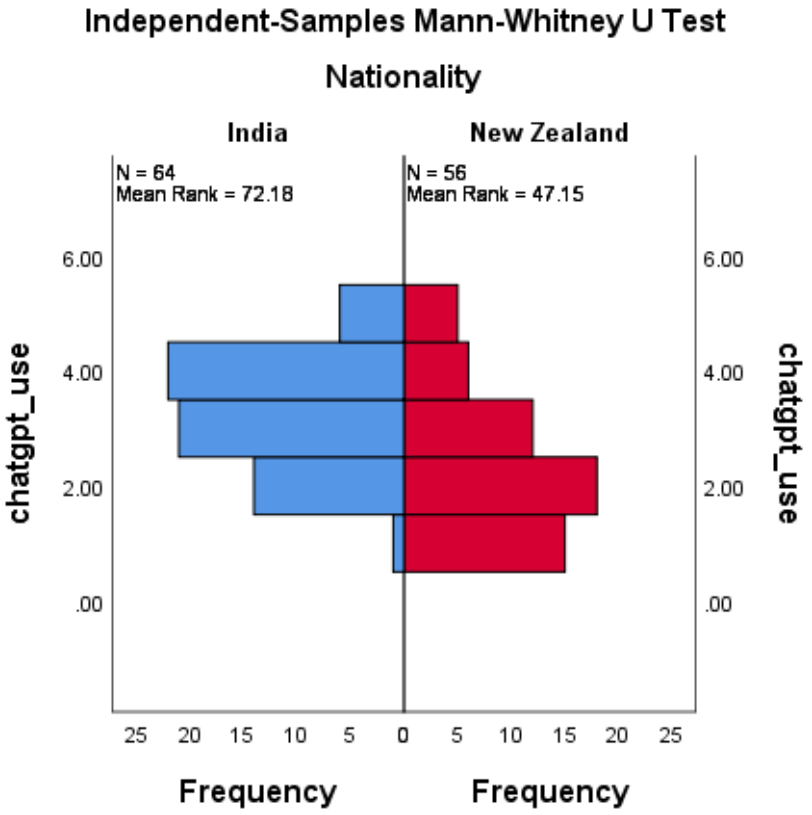
This graph shows that males have a higher mean rank (66.50) compared to females (53.87) for ChatGPT use. This indicates that males, on average, use ChatGPT more frequently than females.

4.9 Interpretation of Hypothesis 5

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
The distribution of chatgpt_use is the same across categories of nationality.	Independent-Samples Mann -Whitney U Test	0.000	Reject the null hypothesis.
The significance level is .050.			

The Mann-Whitney U test yielded a Mann-Whitney U statistic of 2539.500, with a standardized test statistic of 4.046. The asymptotic significance for the two-sided test was reported to be 0.000, which is significantly below the conventional alpha level of 0.050. This outcome suggests a clear difference in how often students from different nationalities use ChatGPT, and this difference is unlikely to be just a coincidence.

Independent-Samples Mann-Whitney U Test Summary	
Total N	120
Mann-Whitney U	2539.500
Wilcoxon W	4619.500
Test Statistic	2539.500
Standard Error	184.747
Standardized Test Statistic	4.046
Asymptotic Sig.(2-sided test)	0.000



It appears that students from India have a higher mean rank (72.18) for ChatGPT use compared to those from New Zealand (47.15). This suggests that, on average, students from India use ChatGPT more than those from New Zealand.

4.10 Interpretation of Hypothesis 6

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
The distribution of chatgpt_use is the same across categories of age.	Independent-Samples Mann -Whitney U Test	0.058	Retain the null hypothesis.
The significance level is .050.			

The Mann-Whitney U test yielded a Mann-Whitney U statistic of 1449.000, with a standardized test statistic of -1.896, and an asymptotic two sided significance of 0.058. Given that the p-value is slightly above the conventional alpha level of 0.050, the null hypothesis is retained. This outcome suggests that the study cannot assert whether the age group of 18 to 20 or 20 to 25 utilizes ChatGPT more.

Independent-Samples Mann-Whitney U Test Summary	
Total N	120
Mann-Whitney U	1449.000
Wilcoxon W	3279.000
Test Statistic	1449.000
Standard Error	185.159
Standardized Test Statistic	-1.896
Asymptotic Sig.(2-sided test)	0.058

5. Results and Discussion

The primary question this study aimed to answer was whether students who use ChatGPT very frequently exhibit higher or lower levels of creativity compared to those who rarely use it. The Mann-Whitney U test was conducted to assess differences in levels of creativity and it was found that creativity levels of both groups are the same. This might be because there are chances that both frequent and rare users have similar baseline creativity levels. Frequent use might not significantly increase creativity for those already high in creativity, and rare use might not significantly decrease it for those already lower.

The second primary question addressed in this study centered on whether there is a connection between how often students use ChatGPT and their creativity levels. To address this, the study conducted a correlation analysis, and similar to the previous analysis the results indicated that the correlation was not statistically significant. Therefore, this study could not confirm a link between students' creativity levels and their use of ChatGPT. It is possible that the way ChatGPT influences creativity might take time to develop, and a short-term study might miss this effect entirely.

This study also measured the perceived usefulness of ChatGPT. The idea behind it was to investigate if there is a significant relationship between how useful students perceive ChatGPT to be and how often they use it. The correlation analysis revealed a positive association: the higher the perceived usefulness, the more frequently ChatGPT is used. In other words, this study found that students who find ChatGPT more useful tend to use it more often.

Another aim of this study was to check if there is a difference in ChatGPT usage among male and female students. The Mann-Whitney U test conducted indicated that there is a statistically significant difference in the distribution of ChatGPT use between the gender categories. It was found that male students utilize ChatGPT more than female students. This may be the case because the current ChatGPT applications are more aligned with interests that typically skew male, such as gaming or technology exploration. However, the concrete reasons behind this finding are not explored in this study but warrant further investigation.

Similarly, this test found that nationality has a significant impact on how students engage with ChatGPT. The study observed that students from India use ChatGPT more than those from New Zealand. This finding raises interesting questions about the factors influencing national differences in ChatGPT usage. One factor could be that India has a large and tech-savvy population, and there may be a greater interest in exploring new technologies like ChatGPT. However, future research is needed to explore the potential causes.

Finally, the study examined potential differences in ChatGPT usage frequency between students aged 18 to 20 and those aged 21 to 25. Once again, the Mann-Whitney U test was utilized, and the results suggested that there is no difference in ChatGPT usage patterns among these age groups.

In conclusion, this study has demonstrated that both frequent and rare users of ChatGPT exhibit similar levels of creativity. Additionally, ChatGPT usage does not correlate significantly with levels of creativity. Perceived usefulness, on the other hand, was positively correlated with usage frequency. Moreover, significant differences in usage patterns were observed based on gender and nationality with male students and Indian students showing more usage of ChatGPT compared to female students and students living in New Zealand, respectively. Conversely, no significant difference was observed in the distribution of ChatGPT usage between the age groups of 18 to 20 and 21 to 25.

6. Conclusion, Limitation and Future Work

This study investigated the relationship between the frequency of ChatGPT use and the levels of student creativity. While previous research presented conflicting findings, the results of this study suggest that ChatGPT usage does not statistically impact creativity levels. There was no significant difference in creativity between those who use ChatGPT frequently and those who rarely do.

However, the study identified other interesting aspects of ChatGPT use. It found a

positive correlation between perceived usefulness and usage frequency. Students who find ChatGPT more valuable tend to use it more often. Additionally, the research revealed significant differences in usage patterns based on demographics. Male students and students from India reported using ChatGPT more than female students and students residing in New Zealand, respectively. The reasons behind these disparities require further investigation.

Nevertheless, the study's scope and measurement approaches had several limitations. It focused specifically on ChatGPT, and the findings may not be generalizable to other AI technologies or language models. The measurement of ChatGPT usage frequency was limited to a single demographic question, which might not accurately capture the extent of usage among participants. Furthermore, creativity is a dynamic and multifaceted process, and while this study aimed to measure creativity levels, it relied solely on one scale, which may not fully capture the complexity of creativity. Utilizing a single questionnaire to assess creativity levels may not provide an accurate representation of individuals' true creative potential. Unfortunately, due to constraints, the study did not employ experimental designs or alternative methodologies to assess creativity. Additionally, people's perceptions of their own ChatGPT usage, its usefulness, and their creativity might not always be entirely accurate, as self-reported measures can be susceptible to biases or inaccuracies.

Furthermore, there are several avenues that merit exploration in future research. This study employed a short-term approach. Future investigations could benefit from a longitudinal design, tracking students over a longer period of time. This would allow researchers to assess if consistent ChatGPT use fosters changes in creativity levels over time. Moreover, this investigation identified gender and nationality as factors influencing usage, but future research could delve deeper into these findings, such as why males are more likely to use ChatGPT. Are there cultural factors specific to India that contribute to higher usage patterns? Additionally, the current study compared frequent and rare users. However, including a control group that does not use ChatGPT could provide a clearer baseline for student creativity levels. This would allow for a more robust comparison between groups. By addressing these areas for future work, researchers can build a more comprehensive understanding.

Overall, this study adds to the current conversation about how big language models, like ChatGPT, affect student creativity. While a clear link between usage and creativity was not established, the findings regarding perceived usefulness and user demographics offer valuable starting points for continued research efforts.

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7. Appendix 1: CPI Items

Sr. No.	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	I often look for information on something that interests me					
2	I ask many questions about something that I have not known					
3	There is a strong urge to know more when I encounter new things					
4	I can easily change the plan, even though I already have a plan					
5	I have a habit of using something for a different function rather than its original function					
6	When others think of one thing, I always thought a couple of different things					
7	Utilizing the existing things is important to me than having to buy new things					
8	Something considered valuable can become even more valuable with a simple change I can make					
9	I would rather make something more useful					
10	I like to combine things to make them more interesting					
11	I admittedly have the skills to create something new					
12	Finding new ways of solving the problem is easy for me					
13	Teachers and friends admit that my habits are unique and exemplary					
14	Friends admit that I am a creative person					
15	I have different ways of solving problems					
16	I easily face a difficult situation in friendship					
17	I believe that eveything happened in my life started with a dream					
18	I believe that what has not yet happened, I can imagine an easier way to achieve					

8. Appendix 2: TAM Items

Sr. No.	Statement	Extremely Likely	Quite Likely	Slightly Likely	Neither	Slightly Unlikely	Quite Unlikely	Extremely Unlikely
1	Using ChatGPT in my job would enable me to accomplish tasks more quickly							
2	Using ChatGPT would improve my job performance							
3	Using ChatGPT in my job would increase my productivity							
4	Using ChatGPT would enhance my effectiveness on the job							
5	Using ChatGPT would make it easier to do my job							
6	I would find ChatGPT useful in my job							