

Reliance of High School Students on Chat Bots and Its Relationship with Creativity

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ABSTRACT : The increasing prevalence of chatbots usage in educational settings has raised concerns about their impact on students' creativity. This study investigates the relationship between reliance on chat bots and creativity among high school students of Chandigarh. Using Pearson's correlation techniques and t-test, the research analyzed data from 96 students through self-constructed scales for reliance on chatbots and creativity. The findings revealed that there is a significant difference among different levels of reliance on chatbots by high school students. Gender shows no difference in reliance on chatbots. Finally there is significant negative correlation between reliance on chatbots and the creativity of high school students. Excessive reliance on chatbots decreases the creativity of high school students.

KEYWORDS: reliance on Chatbots, creativity

I. INTRODUCTION

Chatbots are computer programs designed to simulate conversation with human users, typically through text-based or voice-based interactions. They utilize artificial intelligence (AI) technologies, such as natural language processing (NLP) and machine learning, to understand user queries, provide relevant information, and even perform tasks autonomously.

These are used in various domains and industries for a wide range of purposes including customer service, healthcare, e-commerce, finance and even education. Many businesses deploy chatbots to handle customer enquiries and providing product information. The versatility of chatbots lies in their ability to automate routine interactions, provide instant responses, and handle a large volume of inquiries efficiently. As AI technology continues to advance, chatbots are becoming increasingly sophisticated, capable of understanding context, learning from interactions, and providing personalized experiences across various platforms and devices. Use of Chabot has become increasingly prevalent in recent years. While chatbots can provide quick and convenient access to information, they also present a number of dangerous and ethical concerns (Kooli, 2023).

In the educational setting, chatbots have brought undeniable benefits such as enhanced learning experiences, providing support services and streamlining administrative tasks. The administrative processes such as student registrations, appointment scheduling, accessing campus services etc can be streamlined efficiently using chatbots. Chatbots can be used to deliver course content to students as a conversational agent capable of providing information to the users. Students can ask questions, seek guidance and get personalized help (Chinedu & Ade-Ibijola, 2021). Chatbots are available 24 x 7 so can be used by students to access information and support at any time. This feature is particularly useful in distance learning settings. Some chatbots are designed for personalized tutoring sessions or coaching according to the need of individual students. Chatbots can facilitate student assessments based on predefined criteria and even provide feedback on it. Student can use Chabot for self-assessments also.

Apart from these school students use chatbots to get instant help to complete their home work, projects and assignments. Chatbots provide tailor made answers and content suitable for their assignments. The integration of chatbots into educational settings can contribute to more efficient and effective learning environments (Labadze et al., 2023). Also such AI technologies must collaborate rather than compete with human minds (Vinchon et al., 2023) In case of students, by providing immediate answers and step by step guidance, Chatbots reduces the need to engage in deeper analysis or creative problem solving processes. The increasing reliance of the students on chatbots has sparked concerns about its potential impact on their creativity. Chatbots are powered by AI and are designed to provide instant solutions, contents and guidance. It may reduce the cognitive abilities which are traditionally associated with problem solving and critical thinking.

With frequent and over use of chatbots students become accustomed to quick and structured responses. It diminishes the scope of creative exploration and ideation. Also it constrains students' ability to think outside conventional boundaries, innovate and devise novel solutions independently. Essel, Vlachopoulos, Essuman, & Amankwa (2024) in their study showed that ChatGPT may provide insights and generate creative ideas but it cannot replicate the nuances and complexity of human creativity shaped by personal experiences. Though Chatbots increase efficiency but reliance on them poses challenge to fostering a learning environment that nurtures creativity among students.

It leads to passive approach to learning where students rely more on procedural knowledge rather than critical and creative thinking. Creativity thrives on ability to explore different perspectives, experiments with ideas and developing connections between seemingly related concepts. With overuse of Chatbots students may miss these essential skills. Relying on chatbots or any such tool goes against fundamental aims of education and can lead to superficial understanding of material and hinder the development of the essential skills (Kooli, 2023).

II. REVIEW OF LITERATURE

Essel et al. (2022) investigated the effect of a virtual teaching assistant (chatbots) on academic performance of 68 undergraduate students in Ghana. The study used 2x2 experimental design. The results demonstrated that the students who interacted with chatbots performed academically better than those who interacted with the course instructor. Rostami & Abadi (2023) investigated the effects of chatbots usage on working memory of the students who use chatbots to complete their assignments. The study found different outcomes for different subjects, that is, working memory showed decrease, increase or no change in different subjects. The findings indicate that the use of chatbots has varying and complex effects on cognitive abilities of students especially on their working memory. Černý (2023) conducted study to enlist principles for making chatbots without artificial intelligence to interact with the students. The study was conducted on 79 students and focused on how to design chatbots to interact with students and make them happy. It was found that the students want the chatbots to behave like humans.

Hasanein, & Sobaih (2023) studied that the reliance on Chat GPT can hinder the development of essential critical thinking and problem solving skills. Students may sacrifice their own exploration and analysis as they completely depend on Chat GPT for answers. They may also use it for unethical purposes such as cheating. Excessive use of Chat GPT hinders the development of critical thinking essential for lifelong learning. It also studied the key driver's that push higher education students and faculty to use chat GPT for academic purposes. Parsakia (2023) reviewed literature to assess how the use of chatbots in learning environment influences the psychological aspects and cognitive skills of the students. Studies indicated that chatbots may improve self esteem and self confidence of students but reliance on chatbots negatively impact real human relations. Also there is a risk that reliance on chatbots affects critical thinking of the users as it limits exploration of alternate problem solving strategies. Jindal, Jawanda, Gupta, & Kaura (2024) highlighted the relationship of dependence of students on chatbots with their divergent thinking in their study. 92 high school students were taken as sample.

The results of the study showed that there was no relationship between dependence on chatbots and divergent thinking of students. Girls and boys showed no difference in their dependence on chatbots and even no difference in their divergent thinking while depending on chatbots. Further the researchers found that, the students agreed to use chatbots to increase productivity and save time but were not sure about the reliability and authenticity of the information provided on chatbots. Sabrina Habib (2024) studied the impact of generative AI and chatbots on student's creative skills. The study assessed student's divergent thinking across four dimensions -fluency, flexibility, elaboration and originality. It found that though AI leads to high fluency but students found that after some time it takes over their thinking process so hinders their creative thinking at large. Also AI help in elaboration by providing more detailed and informative answers but excessive reliance on AI might fixate thoughts rather than expanding them.

III. OBJECTIVES

The following objectives of the study relate to the high school students of Chandigarh.

1. between reliance on Chatbots and creativity of high school students of Chandigarh. To study the difference in the differential levels of reliance on Chatbots among high school students of Chandigarh.
2. To study the difference in the reliance on Chatbots between girls and boys high school students of Chandigarh.
3. To study the correlation

Hypotheses

1. There is no significant difference in the differential levels of reliance on Chatbots among high school students of Chandigarh.
2. There is no significant difference in the reliance on Chatbots between girls and boys high school students of Chandigarh.
3. There is no significant correlation between reliance on Chatbots and creativity of high school students of Chandigarh.

Sample : The population of the study is delimited to high school students studying in various schools of Chandigarh. 96 students were selected from the said population.

Tools used

The following tools were used for the collection of data:

1. Dependence on Chatbots scale constructed by Jindal et al. (2024).
2. Creativity scale developed by researchers.

Procedure and collection of data : The research was conducted to study the relationship between reliance on chat bots by the students and their creativity. 96 high school students were surveyed in terms of reliance on chatbots and their creativity. The data was collected using the chatbots reliance scale constructed by Jindal et al.(2024) and the creativity scale by the researchers through Google forms. The data were subjected to statistical analysis. The results and conclusions were drawn out from there.

Statistical tools used : The data were analyzed using descriptive and inferential statistics. Pearson’s coefficient of correlation and t-ratio values were calculated using the related statistical tools through SPSS.

Analysis of data : The present research deals with the relationship of reliance on Chatbots by the high school girls and boys students and their creativity. The objective-wise analysis is presented below.

Objective 1: To study the difference in the differential levels of reliance on Chatbots among high school students of Chandigarh.

The objective was tested by testing the corresponding hypothesis using t-test.

Table 1: Mean and standard deviation values for differential levels of reliance on Chatbots

Groups	N	M	SD	SEm
L	27	32.56	5.774	1.111
M	41	46.44	1.831	.286
H	28	52.64	1.909	.361

Table 2 : t-values between different groups

Groups	t-values	Df	Level of significance
L-M	14.385	66	.01
L-H	17.452	53	.01
M-H	13.583	67	.01

Table 1 shows the mean difference among different levels of reliance on Chatbots. The mean values for low (27), medium (41) and high (28) levels are 32.56, 46.44 and 52.64 respectively. The standard deviation values for the given groups are 5.774, 1.831 and 1.909 respectively. The t- value are 14.385 for means between low and medium groups for 66 degree of freedom, 17.452 for means between low and high groups for 53 degree of freedom and 13.583 for means between medium and high groups for 67 degree of freedom which are found to be significant at .01 levels. Hence the hypothesis “There is no significant difference in the differential levels of reliance on Chatbots among high school students of Chandigarh,” may not be accepted. Alternatively, there is a significant difference in the differential levels of reliance on Chatbots among high school students of Chandigarh.

Objective 2: To study the difference in the reliance on Chatbots between girls and boys

Table 3: Mean, standard deviation and t-values of reliance on Chatbots between girls and boys

Groups	N	M	SD	SEm	Df	t-value	Level of significance
Girls	50	44.58	8.560	1.211	94	.281	NS
Boys	46	44.09	8.646	1.275			

Table 3 shows the mean difference between girls and boys for reliance on Chatbots. The mean values for girls (50), and boys (46) for their reliance on Chatbots are 44.58 and 44.09 respectively. The standard deviation values for the given groups are 8.560 and 8.646 respectively. The t- value is .281 for means between girls and boys for 94 degree of freedom is not significant at .05 level. Hence the hypothesis “There is no significant difference in the reliance on Chatbots between girls and boys of high school students of Chandigarh.,” may be accepted.

Objective 3: To study the correlation between reliance on Chatbots and creativity of high school students of Chandigarh.

Table 4: Coefficient of correlation between reliance on Chatbots and creativity

S.No.	Variable	N	M	SD	r _{A-B}	Level of significance
A	Reliance on Chatbots	96	44.34	8.559	-.578	.01
B	Creativity	96	38.91	5.122		

Table3 shows the correlation between 96 students for their reliance on Chatbots and creativity. The mean values for the scores on reliance on Chatbots by the students and their creativity are 44.34 & 38.91 and standard deviation values are 8.559 & 5.122 respectively. The coefficient of correlation value is -.578 which is significant at .01 level. Hence the hypothesis, “There is no significant correlation between reliance on Chatbots by the students and their creativity” may not be accepted. Since the correlation value is negative so it is found that more the reliance on Chatbots by the students less will be their creativity.

IV. RESULTS AND DISCUSSION

The results of the present study show that there is a significant difference in reliance on Chatbots among the students. Some students use it heavily or more than others. People use chatbots for different purposes, some for quick information, others for brainstorming ideas, or even for companionship. Their usage reflects their specific needs and objectives. The reliance on Chatbots also depends on the experience and comfort level of the students. Users who are more tech-savvy or familiar with AI might use chatbots more extensively and in more complex ways. Others might use them more conservatively or only for basic tasks. Personal preferences play a big role in determining how often and in what ways chatbots are used. Prior experiences also shape the reliance on Chatbots for students. Positive or negative past experiences with chatbots can influence how people use them. Someone who has had a good experience might use chatbots more often, while someone who has had issues might use them less. Some students use chatbots for straightforward tasks or questions whereas some students turn to more human-centric solutions for complex problems or nuanced discussions. So, the task complexity also influences the reliance of students on chatbots.

The present study has shown inverse correlation of reliance on Chatbots with creativity. Chatbots discourage creative thinking of the students. Relying too heavily on chatbots for generating ideas or solving problems can lead to a kind of intellectual laziness. When students depend on AI for answers or creative input, it might limit their own exploration and critical thinking. Chatbots often generate responses based on patterns and data they have been trained on. This can sometimes lead to predictable or formulaic ideas, which might not always push the boundaries of creativity. If students use chatbots to quickly solve problems or provide answers, they might miss out on the process of grappling with challenges and developing problem-solving skills that foster creativity. Since chatbots rely on existing data and trends, they might reinforce conventional thinking rather than encourage truly original or unconventional ideas. This hampers originality in the longer run. These results are supported by Sabrina Habib (2024) & Parsakia (2023).In the present study, no significant gender differences emerged on the reliance on Chatbots. Both male and female students equally rely on chatbots for a variety of reasons, each tailored to their specific needs and contexts.

V. CONCLUSION

This study highlights a critical aspect of chatbots use in educational settings: its potential impact on student creativity. The results indicate that heavy reliance on chatbots is associated with reduced creativity, suggesting that the ease of obtaining immediate answers may lead to diminished engagement in deeper cognitive processes essential for creative thinking. While chatbots enhance efficiency and accessibility, their overuse might undermine the development of problem-solving and critical thinking skills. Gender does not appear to significantly influence the relationship between chatbots usage and creativity. Therefore, educators should be mindful of the balance between leveraging chatbots for their benefits and encouraging activities that foster independent and innovative thinking. Encouraging students to use chatbots as supplementary tools rather than primary sources of solutions could help mitigate potential negative impacts on creativity.

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