



## “Impact of ChatGPT on Student’s Education: A Comprehensive analysis of positive and negative effects”

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<i>Abstract</i>	
	<p>The title of this study is based on an analysis of the impact of ChatGPT on academic performance and the student's insight of using the tool. In this research, the effectiveness of ChatGPT, an artificial intelligence language model, was evaluated in supporting students in their education. The study determines that, ChatGPT can positively and negatively affect student’s academic performance and learning experience, but it should not replace human knowledge and skills. It should be used as an extension to the existing resources. However, there are also risks related to academic issues, unfair learning assessment, inaccurate information, thinking skills and over-reliance on AI.</p>
CC License CC-BY-NC-SA 4.0	<b>Keywords-</b> <i>ChatGPT, Artificial intelligence, Education, Academics, Performance, Impact.</i>

### 1) Introduction-

Generative Pre-trained Transformer (ChatGPT) is an artificial intelligence (AI) tool that can quickly produce detailed replies to prompts and follow-up questions [1]. Integrating ChatGPT into education can support students with tasks like Classroom discussion, homework assistance, and exam preparation. However, as AI tools continue to play an increasingly integral role in education, it is important to examine their possible drawbacks.

This study aims to examine the negative and positive impact of ChatGPT on students learning behavior, addressing concerns related to overdependence, reduced critical thinking, and decreased course material [2].

While ChatGPT has the ability to help educate students by creating instructional content, offering suggestions, and acting as an online educator to learners by answering questions, transforming education through smartphones and other devices, and helping group work, there are clear disadvantages in its use, such as the chance of producing inaccurate or false data. The drawback of ChatGPT is to help provide sincere and sensitive communication with its users. To address the effects of ChatGPT on the learning environment, educating

students about its capabilities and limitations will be crucial. Academic rules and evaluation steps used in educational settings need to be updated, if ChatGPT is to be used in education [3].

## 2) Objectives-

- To analyse how dependent the students are on ChatGPT as a learning tool in their education.
- To find out the impact of ChatGPT on students' critical thinking skills, especially to examining their tendency to verify information provided by ChatGPT.
- To understand the effects of ChatGPT usage on student's engagement with academic performance & course materials.
- To analyse the learning behaviour of students who use ChatGPT with a focus on differences in study habits, independent research, and problem-solving methods.
- To provide insights into the possible disadvantage of ChatGPT as an educational tool.

## 3) Literature Review-

Sarin Sok and Kimkong Heng, in **“ChatGPT for Education and Research: A Review of Benefits and Risks”**, The article argues that ChatGPT has at least five main benefits, such as creating learning assessment, enhancing pedagogical practice, offering virtual personal tutoring, creating an essay or research article outline, and brainstorming ideas [1].

Enkelejda kasneci (Kathrin Sessler, Stefan kuchemann, Maria Bannert, Daryna Dementieva, Frank Fischer, Urs Gasser, Georg Grah), **“ChatGPT for good? On opportunities and challenges of large language models for education”** This commentary presents the potential benefits and challenges of educational applications of large language models, from student and teacher perspectives [2].

Sukhpal Singh Gill (Minxian Xu, Panos Patros, Huaming Wu, Rupinder Kaur), **“Transformative effects of ChatGPT on modern education: Emerging Era of AI Chatbots”**, in this article, leading academics, scientists, distinguish researchers and engineers discuss the transformative effects of ChatGPT on modern education [3].

Marta Montenegro-Rueda( José Fernández-Cerero, José María Fernández-Batanero, Eloy López Meneses), **“Impact of the Implementation of ChatGPT in Education: A Systematic Review”**, This paper is based on a systematic review of the literature, an analysis of the impact of the application of the ChatGPT tool in education [4].

Mohanad Halaweh, **“ChatGPT in education: Strategies for responsible implementation”**, this paper has been written to provide an in-depth examination of these issues and explore the potential use of ChatGPT in educational contexts [5].

## 4) Research Methodology-

For our research, we have chosen a survey-based methodology. A set of questionnaires were prepared which were then circulated among the numbers of students who use ChatGPT as an educational tool. The survey questions were framed based on student's approach towards ChatGPT and analyzed the positive and negative impacts. The analysis was performed from the data gathered from the student's survey.

## 5) Sampling Design-

A Sample of 150 Students (respondents) were selected from our colleges and other college institutes. All respondents attempted to complete the survey using Google Forms.

### 5.1) Data Collection-

Data was collected through Survey method. A standardized survey questionnaire for the research on the impact of ChatGPT on Students educational behaviour involves a range of questions to gather data. Following are the set of questions used in the survey:

<u>What Analyze?</u>	<u>Questions</u>
Demographic Information	Name, Age, Gender
	Do you know about ChatGPT & have you used it?
	How frequently do you use ChatGPT for educational purposes?
	In what educational context have you found ChatGPT most useful?
Overdependence on ChatGPT	With the use of ChatGPT, how would you rate your overall academic performance?
	Do you agree with the following statement - "I use ChatGPT to find answers to my questions rather than researching or problem-solving on my own."
Reduced Critical Thinking	Do you independently verify the information or answers provided by ChatGPT?
	Do you feel using ChatGPT has impacted your thinking skills?
Decreased Course material	Do you think that ChatGPT's fast responses have discouraged you from analyzing information or answers?
	Do you think that your use of study materials has changed since you started using ChatGPT?
Effectiveness of ChatGPT	Has ChatGPT positively or negatively affected your motivation to interact with course materials actively?
	Do you think your study habits and learning behaviour are different from students who do not use ChatGPT for educational purposes?
	For problem understanding or solving which is more effective? <ul style="list-style-type: none"> <li>• YouTube</li> <li>• ChatGPT</li> </ul>
	How would you feel if ChatGPT were not available for your educational work?
	In your opinion, what could make ChatGPT even more useful for your learning?
	Do you feel that ChatGPT has decreased your overall understanding of a subject or topic?

5.2) Data Analysis-

• Demographic Information-

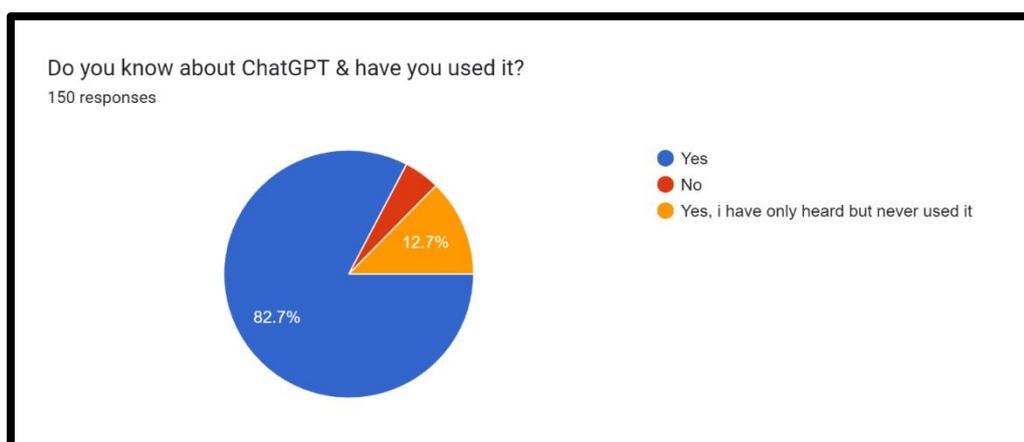


Figure-1

**Explanation-** Figure-1 shows that 82.7% students know and have used ChatGPT while 5.3% don't. There is also case where 12.7% students know about it but have never used it.

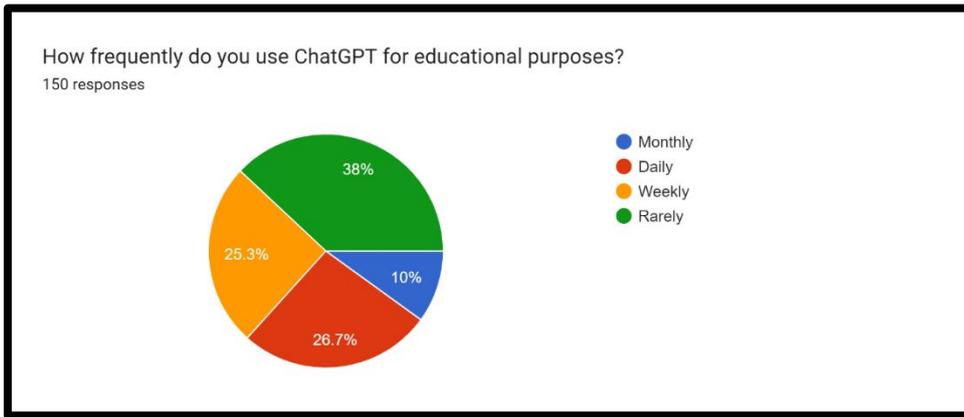


Figure-2

**Explanation-** Figure -2 shows that 38% of students use ChatGPT rarely, 26.7% who use it daily, 25.3% who use it weekly, and 10% who use it monthly.

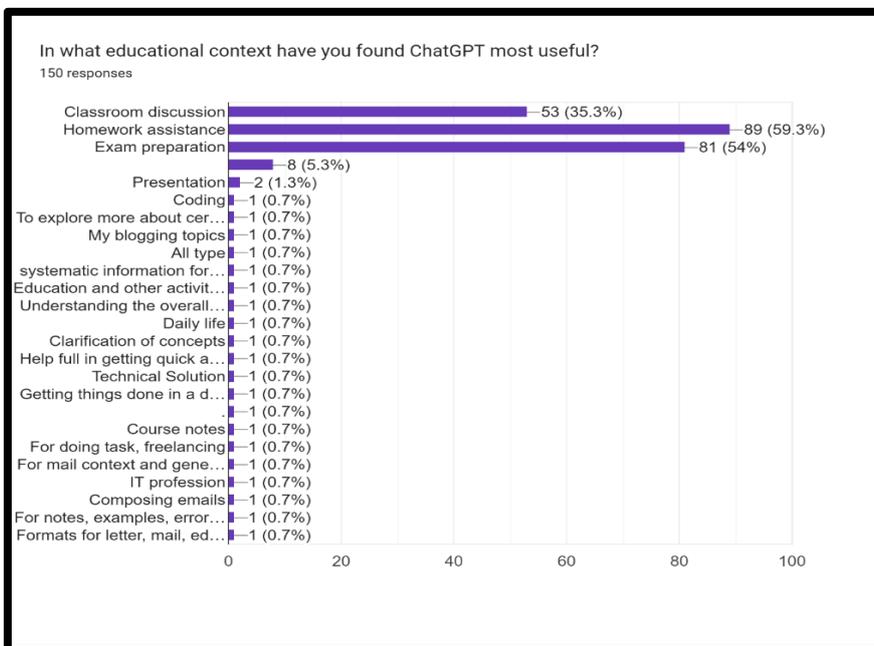


Figure-3

**Explanation-** Figure-3 shows that In educational context, 59.3% students use it for homework assistance, 54% for exam preparation, 35.3% for classroom discussion and the remaining others are shown in the graph.

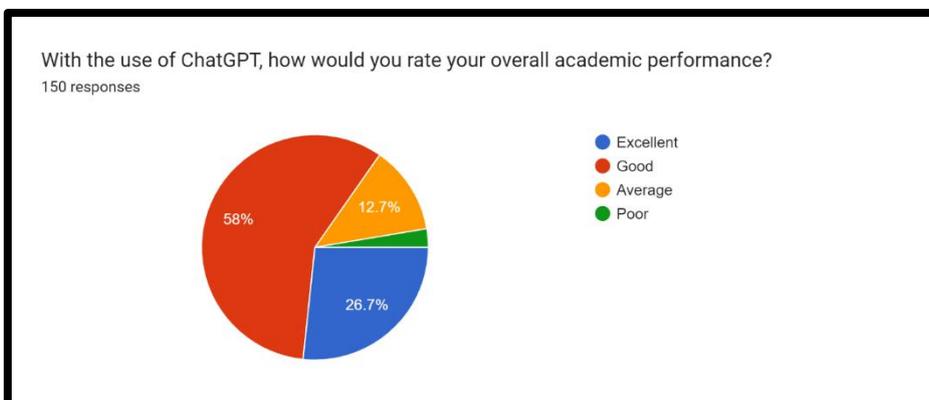
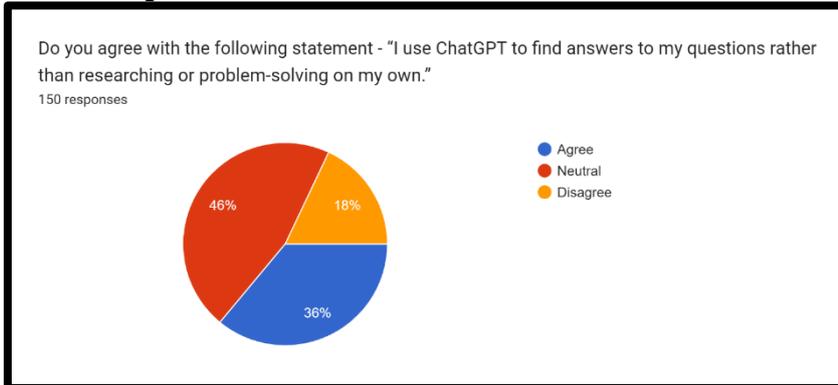


Figure-4

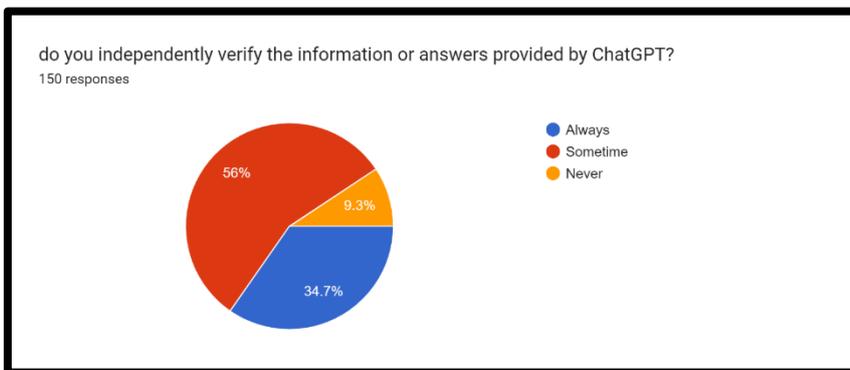
**Explanation-** Figure -4 shows that 58% of students decided ChatGPT was good, 26.7% decided it was excellent, 12.7% decided it was average, and 3.3% decided it was poor.

● **Over-dependence on ChatGPT**



**Figure-5**

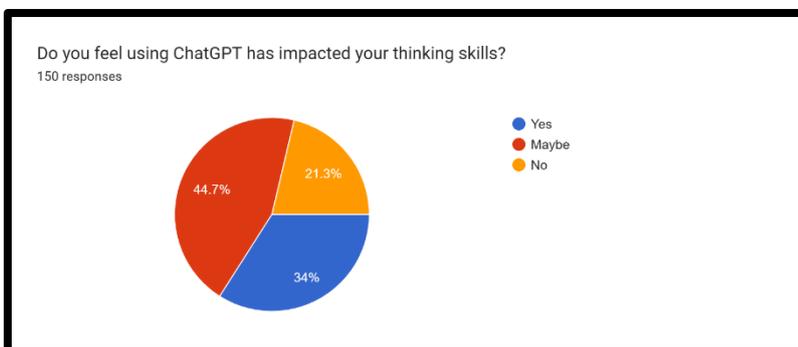
**Explanation-** Figure-5 shows that, 46% students have neutral opinion to the statement, 36% have agreed and 18% have disagreed.



**Figure-6**

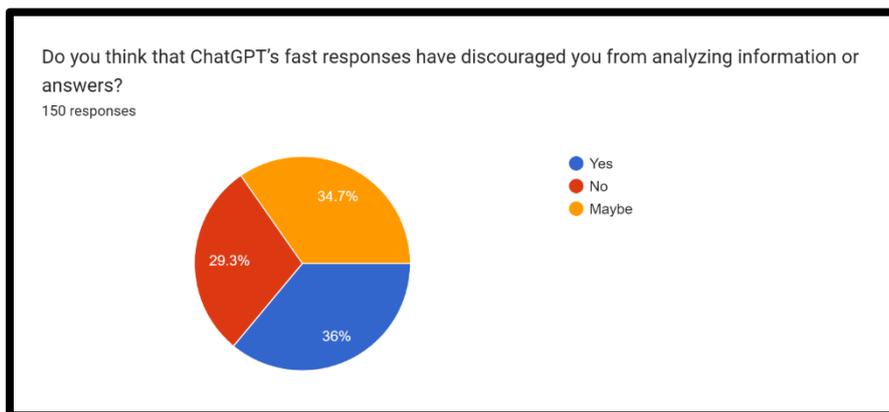
**Explanation-** Figure-6 shows that 56% students verify the information sometimes, 34.7% verify it always and 9.3% never verify provided by ChatGPT.

● **Reduced Critical Thinking-**



**Figure-7**

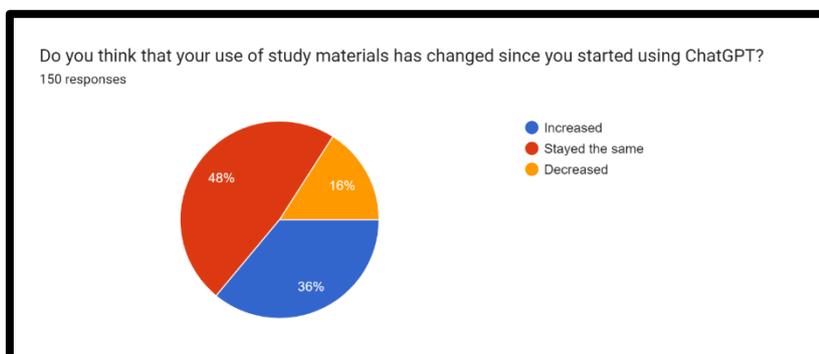
**Explanation-** Figure-7 shows that 44.7% students feel ChatGPT has impacted their thinking skills, 34% feel yes and 21.3% feel no.



**Figure-8**

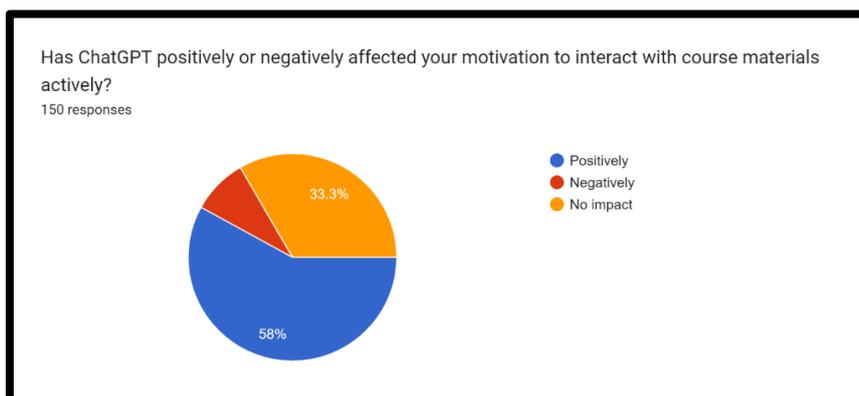
**Explanation-** Figure-8 shows that 36% students say yes it has discouraged them, 34.7% say maybe and 29.3% say no.

- **Decreased course material-**



**Figure-9**

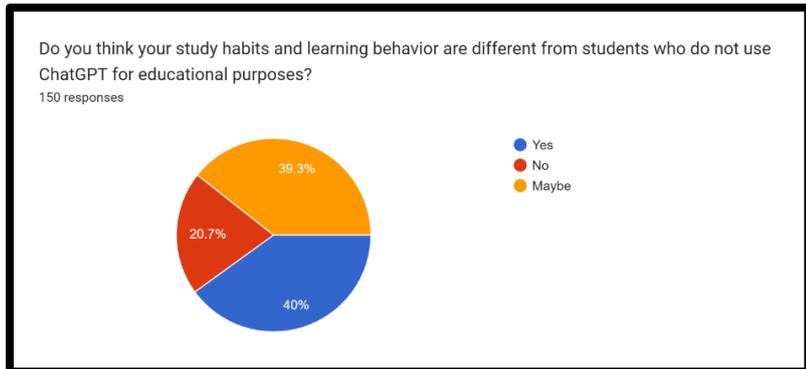
**Explanation-** Figure-9 shows that 48% students think it has stayed the same, 36% think it has increased while 16% think it has decreased.



**Figure-10**

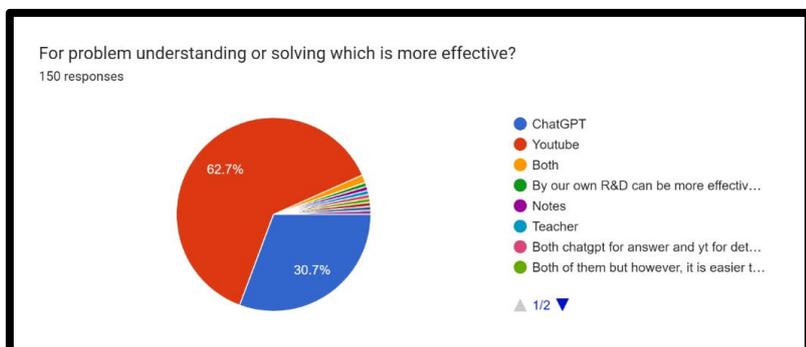
**Explanation-** Figure-10 shows that 58% students feel it has positively affected, 33.3% feel no impact and 8.6% feel negatively impacted.

● **Effectiveness of ChatGPT-**



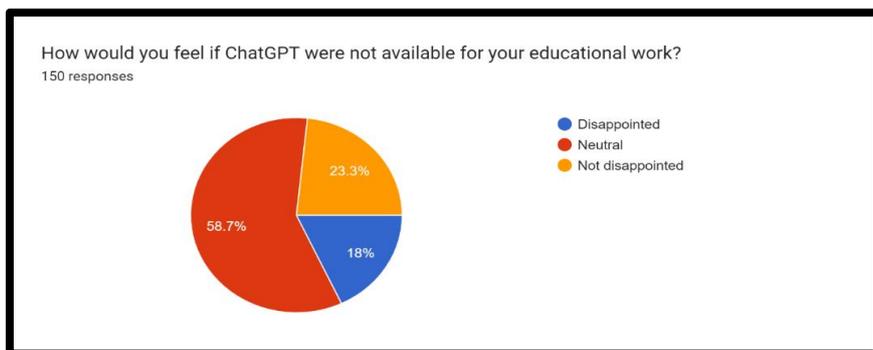
**Figure-11**

**Explanation-** Figure-11 shows that 40% students think that there is a difference, 39.3% think its maybe while 20.7% think there isn't.



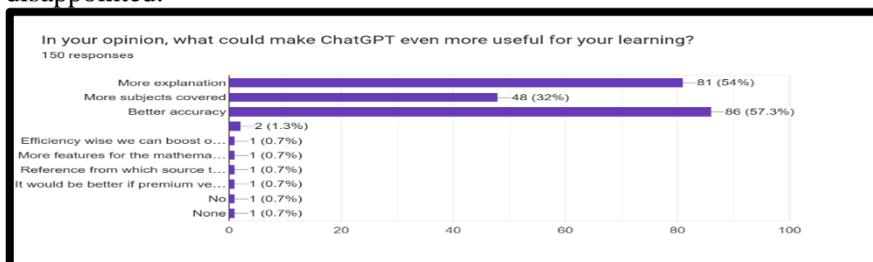
**Figure-12**

**Explanation-** Figure -12 shows that 62.7% student find YouTube more effective and 30.7% find ChatGPT while 6.5 find others.



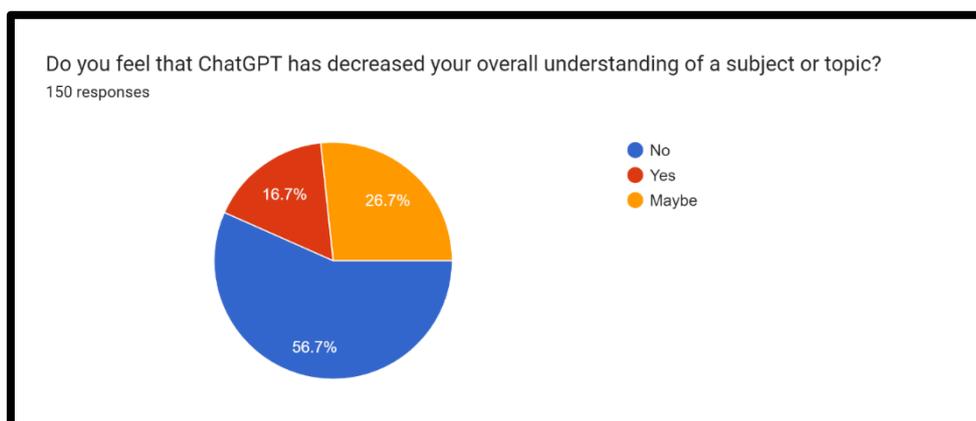
**Figure-13**

**Explanation-** Figure-13 shows that 58.7% students feel neutral, 23.3% feel not disappointed while 18% feel disappointed.



**Figure-14**

**Explanation-** Figure-14 shows that 57.3% students want better accuracy for ChatGPT to be useful, 54% want more explanations, 32% want more subjects covered while the remaining others are shown in graph.



**Figure-15**

**Explanation-** Figure-15 shows that 56.7% students feel no, 26.7% feel maybe and 16.7% feel yes.

## 6) Result and Conclusion-

In conclusion, this research has shown accurate insights on the impact of ChatGPT on student's education. With the majority of students using ChatGPT for the homework assistance and exam preparation they have seen to be exceeded in academic performance. In most cases even when they don't verify the answers provided by ChatGPT they still resort to using it rather than researching answers on their own. Mostly the students have mixed feelings about having ChatGPT impact on their thinking skills. There has been no change in the use of study materials even with the use of ChatGPT and also lot of students think that they differ in study habits & learning behavior from those who do not use ChatGPT. In the comparison between ChatGPT and YouTube, most of the students prefer YouTube because it is easier to grab information from a video rather than reading the output generated by ChatGPT as it can't generate images and show illustrations. Therefore, we concluded that ChatGPT has positive impacts just as much as negative ones.

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