A Study on Perceptions and Usage of ChatGPT among Undergraduate Students: Exploring Generative AI in Higher Education

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Abstract

Reflecting back the days when students spent countless hours in libraries, sifting through reference books, crafting assignments and struggling to meet deadlines. Today, generative AI technologies like ChatGPT have reshaped this academic journey-offering faster access to information, simplifying complex ideas, and empowering students to produce impactful work more efficiently. As the saying goes, "Time and Tide wait for none", the world is accelerating, and to keep pace with booming competition, students must adapt and evolve. One of the ways students have chosen to evolve and withstand the growing demand is adapting AI technology especially ChatGPT in their day-to-day life. Generative AI like ChatGPT have emerged as the powerful tools for transforming education sector especially higher education. This paper aims to demonstrate the levels of understanding, perceptions of the advantages and disadvantages, positive attitude and strong intention to use AI-ChatGPT in the context of higher education.

Keywords: ChatGPT, under graduate students, higher education, generative AI.

Introduction

ChatGPT was introduced in 2022 as an open intelligence tool that acts as the replacement of Google, Wikipedia and many other websites. It excels in normal language understanding and enables text similar to human. All the queries are easily understood and answered in seconds. It has replaced all the search engines and has turned out to be the most used tool by students of higher education. It constantly seeks feedback from the users and works continuously on improvising it to ensure the accuracy and usefulness over time.

It even works as an online instructor offering assistance to students in their assignments and projects providing little to detailed explanation on the searched content. Basically, life of students has become much easier these days with the help of ChatGPT. Bonsu and Baffour-Koduah (2023) researched students' perception and intentions regarding ChatGPT in Ghanaian higher education. They reported a positive attitude towards ChatGPT and solid inclination to incorporate it into learning process, making a compelling case to adopt it into education. However, despite many benefits that ChatGPT has brought to educational environment, its challenges have been an ongoing discussion among stakeholders. Some professors and experts express their opposition, while others are excited about its potential. Researchers have conducted several review studies on ChatGPT in educational context to gain a better understanding of its strengths, weaknesses, and areas requiring further exploration. College students' perspectives on the availability have been the subject of many studies.

There is a gap in our understanding of how students perceive, use and engage with ChatGPT within the context of university because existing research focuses on broader technological aspects in education. In order to fill this void, the purpose of this research paper is to investigate the attitude and experiences of college students regarding the ChatGPT application.

Background and Context

The rapid evolution of education began with the rise in high-speed internet and electronic devices that became the integral part of students' lives. Over time we could see students' increasing dependence on these technologies and now they can't imagine learning without them. This shift paved the way for AI tools like ChatGPT, which emerged as the powerful resource offering instant ideas, answers to their queries and being the greatest support system in their academic journey.

Research Questions

i). How well do you understand the usage of ChatGPT?
ii). What is your attitude towards actual practice in using ChatGPT?
iii). What are your perceptions regarding the advantages of using ChatGPT?
iv). According to you what are the major disadvantages of using ChatGPT?
v). Which is/are the most popular usage of ChatGPT in your daily routine?

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Objectives of the Study

i). To examine the relationship between students' understanding of ChatGPT and their perception of its advantages.
ii). To analyse whether students' attitudes towards ChatGPT influence their daily usage patterns.
iii). To investigate how perceived disadvantages of ChatGPT impact students' recognition of its advantages.

Research Methodology

Primary research has been employed by using the tool of Survey method for this study. The combination of both primary and secondary data is been used.

The secondary data were collected from the books, journals, internet etc. The primary data was collected through well-structured questionnaire. The convenient sampling technique is used to collect the primary data of the respondents. The questionnaire was designed to take the response of undergraduate students who are pursuing education in undergraduate level. The sample size for the study is 83. The questionnaire contains details pertaining to Pedagogical Approach undertaken to understand the perceptions, usage, advantages and disadvantages of ChatGPT by undergraduate students and establish a link between these variables.

Scope and Limitation

The researchers chose Bangalore district as the location for the study. Only the undergraduate students studying in Yenepoya University, Bangalore are the respondents and the research is focused on the view point of UG students only. The sample size is 83 which is lesser than minimum sample requirement of 384.16 calculated using formula for finite population at 95% confidence level and a 5% margin of error estimating population proportion to be 0.5. The collection of samples was hampered by lack of time and geographical hinderance. Additionally, the responses may be biased.

Literature Review

University Students' Perception and Use of ChatGPT: Generative Artificial Intelligence (AI) in Higher Education- Brandon Nacua Obenza, Alexa Salvahan and Alexandra Nicole Rios. This study aims to understand and scrutinise the perception and use of ChatGPT among university students. The findings reveal a significant positive attitude of students towards the utilization of generative AI. Additionally, a slight amount of anxiety is observed among the participants notably regarding the constraints on social connections.

i). **The Role of ChatGPT in Higher Education:** Benefits, Challenges, and Future Research Directions-Tareq Rasul, Sumesh R Nair, Daine kalendra.
   This paper has a mixture of opinion regarding the usage of ChatGPT. On one hand they believe that ChatGPT assists students in generating ideas, academic writing, data analysis, potentially improving their learning experiences. On the contrary the risk of academic misconduct, bias and falsified information is also observed.

ii). In a study by Kuzdeuov et al. (2023), the author has analysed from the study that it provides digital content and knowledge to impaired individuals also by means of visualization in the form of text-speech facility. Moreover, it also plays a critical role of eliminating the bias and insufficient information position with the help of ChatGPT driven knowledge.

Analysis and Interpretations

Hypothesis Testing

i). Chi Square Test Calculation and Results

Null hypothesis H0 = There is no significant relationship between the usage of ChatGPT and Perceptions of its advantages.

Alternate Hypothesis H1= There is significant relationship between the usage of ChatGPT and Perceptions of its advantages.

p value<0.05-Reject H0, p value>0.05-Accept H0

Observed Values

Table 1: Observed Values of participants' usage and perceptions regarding the advantages of ChatGPT

Usage of ChatGPT/Perceptions of advantages	I believe ChatGPT can provide me with more learning opportunities	I think ChatGPT can help me enhance my learning abilities	I think ChatGPT can help me improve the quality of my learning	Row Total
I believe ChatGPT can help me learn more effectively	9	11	10	30
I find using ChatGPT to be simple & convenient	10	12	21	43
Iam willing to invest time & effort to better utlilize ChatGPT for learning	2	4	4	10
Column Total	21	27	35	83

Expected Values

Table 2: Expected Values of participants' usage and perceptions regarding the advantages of ChatGPT

Usage of ChatGPT/Perceptions of advantages	I believe ChatGPT can provide me with more learning opportunities	I think ChatGPT can help me enhance my learning abilities	I think ChatGPT can help me improve the quality of my learning
I believe ChatGPT can help me learn more effectively	7.590361446	9.759036145	12.65060241
I find using ChatGPT to be simple & convenient	10.87951807	13.98795181	18.13253012
Iam willing to invest time & effort to better utlilize ChatGPT for learning	2.530120482	3.253012048	4.21686747

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CHISQUARE = (Observed Value-Expected Value) ^2/Expected Value

Table 3: Chi Square Value from the above Observed and Expected values.

Usage of ChatGPT/Perceptions of advantages	I believe ChatGPT can provide me with more learning opportunities	I think ChatGPT can help me enhance my learning abilities	I think ChatGPT can help me improve the quality of my learning
I believe ChatGPT can help me learn more effectively	0.261790017	0.157801577	0.555364314
I find using ChatGPT to be simple & convenient	0.071101682	0.282525451	0.453460353
Iam willing to invest time & effort to better utlilize ChatGPT for learning	0.111072863	0.171530567	0.011153184

Sum of (O-E) ^2/E

Table 4: Chi Square test results for usage and perceptions of advantages of ChatGPT.

Xsquare value	2.075800008
degree of freedom(df)	4
p value	0.721819525

p value>0.05-Accept H0

There is no significant association between usage of ChatGPT and perception of its advantages.

Interpretation

A Chi square test was conducted to examine a relationship between the usage of ChatGPT and perception of its advantages. The analysis shows a Chi square value of 2.075 with 4 degrees of freedom and p value is 0.7218. Since at 0.05 significance level, p value is greater than 0.05, we fail to reject the null hypothesis. Thus, there is no significant relationship between the ChatGPT usage and its advantages

ii). Chi Square Test Calculation and Results

Null hypothesis H0 = There is no significant relationship between the attitude and daily usage of ChatGPT

Alternate Hypothesis H1= There is significant relationship between the attitude and daily usage of ChatGPT.

p value<0.05-Reject H0

p value>0.05-Accept H0

Observed Values

Table 5: Observed Values of participants' attitude and daily usage of ChatGPT.

Attitude/Daily Usage	Personal interest & learning	Research assistance	Solving academic queries	Row total
I use ChatGPT to help me gain a deeper understanding of the English Language & Literature	5	10	10	25
I use ChatGPT to improve my English communication skill	3	4	10	17
I use ChatGPT to increase my interest & motivation in learning	6	15	20	41
Column total	14	29	40	83

Expected Values

Table 6: Expected Values of participants' attitude and daily usage of ChatGPT.

Attitude/Daily Usage	Personal Interest & Learning	Research assistance	Solving academic queries
I use ChatGPT to help me gain a deeper understanding of the English Language & Literature	4.21686747	8.734939759	12.04819277
I use ChatGPT to improve my English communication skill	2.86746988	5.939759036	8.192771084
I use ChatGPT to increase my interest & motivation in learning	6.915662651	14.3253012	19.75903614

CHISQUARE = (Observed Value-Expected Value) ^2/Expected Value

Table 7: Chi Square Value from the above Observed and Expected values.

Attitude/Daily Usage	Personal interest & learning	Research assistance	Solving academic queries
I use ChatGPT to help me gain a deeper understanding of the English Language & Literature	0.145438898	0.183215621	0.348192771
I use ChatGPT to improve my English communication skill	0.006125342	0.633471004	0.398653437
I use ChatGPT to increase my interest & motivation in learning	0.121237563	0.031777235	0.002938584

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Sum of (O-E) ^2/E

Table 8: Chi Square test results for attitude and daily usage of ChatGPT.

Chi square value	1.871050456
degree of freedom	4
p value	0.759460852

p value>0.05-Accept H0

There is no significant relationship between the attitude and daily usage of ChatGPT.

Interpretation

A Chi square test was conducted to examine a relationship between the attitude and daily usage of ChatGPT. The analysis shows a Chi square value of 1.871 with 4 degrees of freedom and p value is 0.7594. Since at 0.05 significance level, p value is greater than 0.05, we fail to reject the null hypothesis. Thus, there is no significant relationship between the attitude and daily usage of ChatGPT.

iii). Chi Square Test Calculation and Results

Null hypothesis H0 = There is no significant relationship between the disadvantages and advantages of ChatGPT

Alternate Hypothesis H1= There is significant relationship between the disadvantages and advantages of ChatGPT.

p value<0.05-Reject H0

p value>0.05-Accept H0

Observed Values

Table 9: Observed Values of participants' regarding advantages and disadvantages of ChatGPT.

Disadvantages/Advantages	I believe ChatGPT can provide me with more learning opportunities	I think ChatGPT can help me enhance my learning abilities	I think ChatGPT can help me improve the quality of my learning	Grand Total
I think ChatGPT is not helpful for my English learning	1	2	1	4
I think ChatGPT may have issues with plagiarism or information leakage	6	2	8	16
I think ChatGPT's responses may contain some inaccurate information	14	23	26	63
Grand Total	21	27	32	83

Expected Values

Table 10: Expected Values of participants' regarding advantages and disadvantages of ChatGPT.

Disadvantages/Advantages	I believe ChatGPT can provide me with more learning opportunities	I think ChatGPT can help me enhance my learning abilities	I think ChatGPT can help me improve the quality of my learning
I think ChatGPT is not helpful for my English learning	1.012048193	1.301204819	1.686746988
I think ChatGPT may have issues with plagiarism or information leakage	4.048192771	5.204819277	6.746987952
I think ChatGPT's responses may contain some inaccurate information	15.93975904	20.4939759	26.56626506

CHISQUARE = (Observed Value-Expected VALUE) ^2/Expected Value

Table 11: Chi Square Value from the above Observed and Expected values.

Disadvantages/Advantages	I believe ChatGPT can provide me with more learning opportunities	I think ChatGPT can help me enhance my learning abilities	I think ChatGPT can help me improve the quality of my learning
I think ChatGPT is not helpful for my English learning	0.000143431	0.375278893	0.279604131
I think ChatGPT may have issues with plagiarism or information leakage	0.941049914	1.973337796	0.232702238
I think ChatGPT's responses may contain some inaccurate information	0.236055332	0.306439161	0.012070049

Sum of (O-E) ^2/E

Table 12: Chi Square test results for advantages and disadvantages of ChatGPT.

Chi square value	4.356680944
Degree of freedom	4
p value	0.35988121

p value>0.05 – Accept H0

There is no significant relationship between the disadvantages and advantages of ChatGPT.

Interpretation

A Chi square test was conducted to examine a relationship between the disadvantages and advantages of ChatGPT. The analysis shows a Chi square value of 0 with 4 degrees of freedom and p value is 1. Since at 0.05 significance level, p value is greater than 0.05, we fail to reject the null hypothesis.

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Thus, there is no significant relationship between the disadvantages and advantages of ChatGPT.

Key Findings
The Chi-square test ($\chi^2 = 2.075$, p = 0.7218) indicates no significant relationship between ChatGPT usage and the perception of its advantages**.** This indicates that perception of ChatGPT's benefits doesn't necessarily depend upon how frequently they use the chatbot. The respondent's perception is independent of its usage.

The Chi-square test result ($\chi^2 = 1.871$, p = 0.7594) shows no significant relationship between users' attitude toward ChatGPT and their popular daily usage**.** This shows that student's positive or negative attitude doesn't actually influence its popular usage. Other factors, such as necessity, availability, or personal habits, may play a more significant role in usage patterns.

The Chi-square test result ($\chi^2 = 0$, p = 1) suggests that users' perception of ChatGPT's advantages and disadvantages are independent of each other. The findings implies that strength and weaknesses are evaluated separately. The pros and cons are evaluated on the basis of respondent's personal experiences and there is no relationship between them.

Suggestions
i). Since perceptions of advantages and usage are not linked to each other, the potential of ChatGPT has not been maximised and the students are not worried about the outcomes, rather they feel it is a necessity to balance their academic growth. Hence there is a requirement from the higher education institutions to introduce workshops, training sessions, awareness programmes to maximise the effective usage.

ii). Given that respondent's attitude is not influencing the popularity of daily usage of ChatGPT, further research can be conducted to identify what are the other factors that influence its popularity.

Respondents are not critically weighing advantages and disadvantages together. This suggests that there is a lack of critical thinking and digital literacy among students. Educational institutions can integrate discussions on responsible AI usage, helping students balance the benefits of ChatGPT while being mindful of its limitations

Conclusion
In conclusion, the use of AI, particularly ChatGPT, in higher education is attracting attention due to its opportunities and implications for teaching and learning. However, there are also concerns about its potential risks. This paper aims to address this disconnect by exploring the opportunities and challenges associated with ChatGPT. The results of this study strictly tell us that there is lack of digital literacy among the students. Thus, it is essential to promote critical thinking when relying on any digital tool. Higher education institutions need to adopt steps to promote the effective use of ChatGPT and also warn them of potential risks. Any AI generative tool should be used as enhancement of existing knowledge and should not promote dependency. The growing dependency of students on ChatGPT that can lead to mental stagnation in the long run. Therefore, educators and students must exercise caution when using this technology for academic purpose. Moreover, collaborative learning and discussion should be promoted.

The findings of this study also reveals that there is no dependency within each variable and they exist independently on their own. Finally, we strongly argue that using ChatGPT in higher education requires a balance between preventing academic misconduct and promoting academic freedom and innovation while prioritising the development of key graduate skills. By doing so, ChatGPT can be an effective tool that enhances, rather than hinders students' learning experiences.

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