

To Study the Impact of Chatgpt Tool on Academic Learning: Perspective of Students and Teachers in Higher Education

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Abstract

Purpose

The purpose of this paper is to present a preliminary study of (1) The usage of ChatGPT tool by students and teachers, (2) The impact of ChatGPT tool on students and teachers learning aspects. (3) Advantages and Disadvantages of using ChatGPT tool in academic learning process.

Design/methodology/approach

This research employs both qualitative and quantitative methodologies, with data analysis conducted utilizing SPSS software and in person interviews conducted with teachers and students. The study encompasses a sample of 115 students and 100 teachers of higher education institutes, as participants, of which 95 students and 73 teachers met the eligibility criteria.

Findings

The findings suggest that both students and teachers make extensive use of ChatGPT for various purposes, including academic learning. Among the students, a majority agreed that they use it for academic learning. However, in the case of teachers, most of them indicated that they use ChatGPT for purposes other than academic learning or teaching.

Originality / Value

This research makes the unique contribution of identifying the impact of ChatGPT tools by students and teachers in higher education. The research also finds potential advantages and disadvantages of the use of ChatGPT and the ethical concerns attached to it's usage.

Keywords: ChatGPT, Learning, Students, Teachers, Higher Education, Artificial Intelligence (AI).

1. Introduction

Artificial Intelligence has experienced substantial growth, profoundly impacting the way people traditionally approached thinking and working. The utilization of AI has catalyzed advancements in previously unexplored domains, displaying remarkable potential for growth. This field has gained significant prominence and generated considerable curiosity about how to educate and equip the current generation with these new skills. Ensuring that this generation comprehends the appropriate application of AI tools to enhance productivity is of paramount importance. It is worth noting that accomplishing this task is no small feat. To address this pressing issue, it is crucial to grasp and understand the capabilities of AI tools. AI is expected to reduce the time, cost and energy spent in doing routine tasks. (AI and the Future of Skills, Volume 1, 2021).Recent advancements in AI have also demonstrated the potential for AI to take on, either entirely or partially, creative tasks that have traditionally been the domain of skilled professionals, including academic writing, coding, and art. (Li et al., 2022).Leveraging the abundance of large datasets, researchers have created tools like chatbots and other AI conversational systems that provide real-time responses to human interactions. One prominent example of such a tool is ChatGPT, which has found widespread adoption among students, educators, professionals, and various other individuals. It serves as a valuable resource for simplifying intricate tasks, including writing, accessing information, report generation, and expeditiously completing assignments.

This study is centered on the utilization of the ChatGPT tool for academic purposes among both students and teachers. Given the significant attention ChatGPT has garnered within the academic community, it became pertinent to investigate the specific contexts in which it is employed. The study delves into understanding the preferences of educators and students regarding the use of ChatGPT in their academic learning and advancement. Additionally, it examines the real-world usage patterns of ChatGPT among academics and students.

2. Literature Review

Yeadon et al. (2023) observed that ChatGPT has the capacity to generate numerous unique instances that educators can demonstrate. As ChatGPT continues to evolve, it holds the potential to serve as a personalized tutor in a one-on-one setting. According to the assessment by (Lim et al., 2023), specific researchers have characterized ChatGPT as a companion, a sage, or a mentor due to its capability to engage in interactions that closely resemble human conversation. They also highlighted that ChatGPT offers a chance for educators to identify areas of deficiency in student learning and for students to receive prompt feedback.

According to the findings of (Haleem et al., 2022), their research indicated that ChatGPT possesses the capability to rapidly generate content by drawing from the provided material. This could potentially contribute to improving the caliber of content and aiding individuals in accomplishing their literary objectives. The study also highlighted ChatGPT's potential to detect and enhance different issues, suggesting that in the future, ChatGPT could revolutionize the manner in which humans engage with technology.

In a study carried out in the United States by (Zhai, n.d.), it was proposed that there should be a shift in assessment formats and educational institutions should prioritize fostering the critical thinking capacities of students, an aspect that artificial intelligence (AI) cannot supplant. The researcher also underscored the role of AI tools as aids for imparting subject knowledge, while urging students to actively employ their creative and critical thinking abilities. The significance of students utilizing AI tools like ChatGPT to attain learning objectives and tackle real-world challenges was also emphasized.

Numerous researchers have endeavored to investigate the potential advantages and drawbacks of utilizing ChatGPT as an educational tool for students. In a particular study by Fuchs K. (2023), the focus was on exploring how the employment of the ChatGPT tool can offer students a more personalized learning experience that caters to their individual needs and requirements. This tool facilitates on-demand assistance, a crucial element for effective learning. However, the research also identified potential challenges associated with ChatGPT usage. It was noted that some prospective users express skepticism regarding the reliability of the content generated by ChatGPT. Additionally, another challenge involves the risk of students excessively relying on the technology, which could potentially impede their creative thinking and critical reasoning abilities over the long term.

The study carried out by Abou El-Seoud et al. (2023) illustrates that AI has the potential to be a valuable asset within the classroom, contrary to concerns that AI tools such as ChatGPT might lead to students overly reliant on technology. This is achievable as long as educators maintain a strong emphasis on fostering critical thinking and meaningful interpersonal interactions. By upholding these priorities, AI can contribute to enhancing the educational journey and overall experiences of all students.

3. Research Gap

Numerous studies and reports that have been reviewed concerning ChatGPT and other AI language learning models primarily concentrate on the direct evaluation of these models. They involve employing the models to create content in order to assess their capabilities, potential advantages, and associated challenges. The research conducted by (Zhai, n.d.; Neumann et al., n.d.; Sun & Hoelscher, 2023; Javaid et al., 2023) within an educational context underscores the significance of ChatGPT in the field of education. While several researchers have delved into the perceptions of students regarding ChatGPT (Mensah Bonsu & Baffour-Koduah, n.d.; Shoufan, 2023) there is currently a gap in research concerning the actual impact of the ChatGPT tool on both the academic learning of students and teachers.

Recognizing the importance of the existing studies as a foundation for our current research, we aim to assess the factors influencing the utilization or avoidance of ChatGPT as an educational tool by both students and teachers, specifically within

higher education. Through this research paper, we intend to offer valuable insights to educational stakeholders, aiding them in formulating strategies, making informed decisions, and implementing effective measures concerning the integration of AI tools like ChatGPT as an additional teaching methodology.

Given the swift evolution of this novel concept, conducting real-time research on emerging technological tools like ChatGPT becomes imperative.

4. Objectives of the Study

Identifying the research Gap and understanding the gaining importance of ChatGPT, the following objectives are developed for the current study:

1. To study the usage of ChatGPT tool by students and teachers.
2. To analyse the impact of chatGPT tool on students and teachers learning aspect.
3. To identify the advantages and disadvantages of ChatGPT tool in academic learning process.

5. Hypothesis Development

The following hypothesis will be tested through this research:

H₀: There is no significant impact of ChatGPT tool on student learning.

H₁: There is a significant impact of ChatGPT tool on student learning.

H₀: There is no significant implication of ChatGPT tool in enhancing qualitative academic delivery of teachers.

H₂: There is a significant implication of ChatGPT tool in enhancing qualitative academic delivery of teachers.

6. Research Methodology

6.1. Research Design: The research design of the study utilizes a blended research methodology, incorporating both qualitative and quantitative data collection techniques. Qualitative data was gathered through interviews, wherein researchers conducted interviews with faculty members engaged in higher education as well as post-graduate students. The aim was to comprehensively comprehend the utilization of ChatGPT by both faculty and students. On the other hand, quantitative data was amassed via surveys to systematically assess the impact of ChatGPT tools on the Academic Learning of Students and Teachers of higher education.

6.2. Sampling Method and Population: The method of convenience sampling was employed to guarantee a well-rounded sample of both students and teachers hailing from various universities and institutes within the Delhi National Capital Region (NCR). A total of 200 targeted respondents were provided with questionnaires. Out of the initial group of 200 respondents who were approached, a total of 168 responses were considered comprehensive and appropriate for integration into the study. Within this pool of 168 responses, 95 of responses were from students, while the remaining 73 were of teachers. The researcher took measures to confirm that the gathered data fulfilled the required standards for analysis. Additionally, personal interviews were conducted with select faculty members and students.

6.3. Research Instrument: For this study, data collection was conducted using a combination of a questionnaire and individual interviews as research instruments. The structured questionnaire encompassed a blend of both open-ended and closed-ended inquiries. The questionnaire's initial segment was designed to ascertain whether the participant utilized ChatGPT. In cases where faculty members and students did not use ChatGPT, they were directed to conclude the questionnaire at that point. The subsequent section delved into the particulars of ChatGPT usage, exploring how both students and faculty members engaged with the platform. Prior to questionnaire submission, respondents were also prompted to provide their demographic information.

6.4. Data Analysis Tools: The data was analysed using the following tools:

1. Pearson's Correlation Coefficient
 2. Simple Linear Regression
- One way ANOVA

7. Results of the Study

7.1 Demographic Profile of Respondents

Many researchers insisted the role of demographic factors and its impact on the study. In this research the demographic profile of the respondents was analysed to find its impact on the usage of ChatGPT by the certain gender and age of respondents amongst teachers and students.

Table 7.1.1 Demographic Profile of Respondent's

Respondents	Frequency	Percentage
Teachers	73	43%
Students	95	57%
Gender		
Male	87	52%
Female	81	48%
Age Teachers		
25-30	21	29%
31-35	12	16%
36-40	10	14%
41-45	18	25%
46-50	6	8%
51 & above	6	8%
Age Students		
20-23	42	44%
24-27	32	34%
28-31	0	0%
32 & above	21	22%

Respondents

Table 7.1.1 reflects that out of 168 respondents 43% respondents were Teachers and 57% respondents were students.

Gender

Table 7.1.1 clearly reflects that there was no major difference in the respondents being male or female in this study as 52% were females and 48% were males. However, if we see the gender ratio of teachers and students separately, we will find that more female teachers responded to the survey and more number of male students responded for this survey.

Age Group

The respondent's aged between 25-30 years constituted majority teachers followed by the age group of 41-45 amongst teachers. Students were mostly between the age groups of 20-23 (44%) followed by age group of 24-27 (34%).

7.2 Usage of ChatGPT tool by students and teachers

The survey was conducted within educational institutions, with participation limited to teachers and students who had used the ChatGPT tool at least once. From a pool of 73 teachers, a significant proportion, specifically 52 of them, reported using ChatGPT daily, and among those, 45 mentioned they use it for educational purposes. Similarly, among students, 74 out of 95 indicated that they use ChatGPT daily, and within this group, 64 mentioned that they use it for educational purposes.

7.2.1. Analyse the impact of chatGPT tool on students and teachers learning aspect.

7.2.1.1 Regression Model – Linear Relationship between ChatGPT Tool and Academic Learning of Students

Academic Learning of Students
R = 0.668
R Square = 0.447
Adjusted R Square = 0.427
Std. Error = 0.531

The correlation coefficient value (R) is 0.668 for Model, which reflects a good amount of correlation between the independent factor (ChatGPT) and dependent factor (Academic Learning of students). The R square value gives us the goodness of the fit of the regression model. That is, the amount of variability explained by the whole of the selected predictor factor in the model accounts for 42.7% of variation in the dependent factor (Academic Learning of Students).

7.2.2. ANOVA for ChatGPT tool and Student Learning and Qualitative Academic Delivery

7.2.2.1. ChatGPT tool & Student Learning

Table: 7.2.2.1. ANOVA – ChatGPT Tool & Student Learning

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig. (p)
Student Learning	Regression	7.32	1	7.32	7.12	.000*
	Residual	4.61	93	0.04		
	Total	11.93	94			

*: significant at 5% level

The table 7.2.2.1 reflects that the *p* value of the independent variable, ChatGPT, is statistically significant ($p < 0.05$), it is likely that ChatGPT tool does have a significant impact on the student learning. Hence the alternate hypothesis is accepted, and the null hypothesis is rejected. It is verified that there is a significant impact of ChatGPT tool on student learning.

Rejected
H ₀ : There is no significant impact of ChatGPT tool on student learning.

Accepted
H ₁ : There is a significant impact of ChatGPT tool on student learning.

7.2.2.2. ChatGPT tool & Qualitative Academic Delivery

Regression Model 7.2.2.2.– Linear Relationship between ChatGPT Tool and Qualitative Academic Delivery

Qualitative Academic Delivery
R = 0.694
R Square = 0.483
Adjusted R Square = 0.368
Std. Error = 0.621

The correlation coefficient value (R) is 0.694 for Model, which reflects a good amount of correlation between the independent factor (ChatGPT) and dependent factor (Qualitative Academic Delivery). The R square value gives us the

goodness of the fit of the regression model. That is, the amount of variability explained by the whole of the selected predictor factor in the model accounts for 48.3% of variation in the dependent factor (Qualitative Academic Delivery).

Table: 7.2.2.2. ANOVA –ChatGPT tool & Qualitative Academic Delivery.

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig. (p)
Student Learning	Regression	6.29	1	6.29	7.12	.07*
	Residual	2.42	71	0.03		
	Total	8.71	72			

*: not significant at 5% level

The table 7.2.2.2 reflects that the *p* value of the independent variable, ChatGPT, is not statistically significant ($p > 0.05$), it is likely that ChatGPT tool does not have a significant implication in enhancing qualitative academic delivery. Hence the null hypothesis is accepted, and alternate hypothesis is rejected. It is verified that there is no significant implication of ChatGPT tool in enhancing qualitative academic delivery of teachers.

Accepted
H ₀ : There is no significant implication of ChatGPT tool in enhancing qualitative academic delivery of teachers.

Rejected
H ₂ : There is a significant implication of ChatGPT tool in enhancing qualitative academic delivery of teachers.

7.3. Testing of Hypothesis

In Table 7.2.2.1, the p-value ($p < 0.05$) indicates that the null hypothesis (H₀), which states that there is no significant impact of ChatGPT tool on student learning, is rejected. In turn, the alternative hypothesis (H₁), positing a significant impact of ChatGPT tool on student learning, is accepted. Consequently, it can be inferred that a noteworthy and statistically significant relationship exists between ChatGPT tools and student learning.

In Table 7.2.2.2, the p-value ($p > 0.05$) suggests that the null hypothesis (H₀), which asserts that there is no significant impact of the ChatGPT tool on improving the quality of teachers' academic delivery, is accepted, while the alternative hypothesis (H₂), which suggests a significant impact of the ChatGPT tool on enhancing the quality of teachers' academic delivery, is rejected. Consequently, it can be concluded that there is no substantial and statistically significant evidence to support the idea that the ChatGPT tool has a meaningful impact on enhancing the quality of teachers' academic delivery.

8. Findings from the interview data

To address the qualitative dimension, the study involved interviewing both teachers and higher education students. These interviews were undertaken to complement and substantiate the research findings. We applied the directed qualitative content analysis method to interpret the data obtained from these interviews. In summary, the content analysis revealed that ChatGPT holds significant promise in augmenting the knowledge of both students and teachers but are used less due to various apprehensions attached to it.

8.1 Awareness of ChatGPT

The initial interview questions were designed to inquire about the sources through which students became acquainted with ChatGPT. The students offered diverse responses, including mentions of learning about it from friends, classmates, during conferences and seminars, and via social media channels. A selection of these responses is presented in Excerpt 1 to 3.

Excerpt 1

“I got to know about it through one of my friends” (Respondent 1)

Excerpt 2

“I heard about ChatGPT in a conference arranged by college where a guest spoke about it and then I enquired about it from a friend” (Respondent 4)

Excerpt 3

“I got to know about ChatGPT through a YouTube channel” (Respondent 5)

Excerpts 1 to 3 show that the students got to know about ChatGPT mainly through friends and social media. The other interview responses concur with these: through batchmates, through one of my teachers, and just heard some people talking about it. The next question aimed at revealing the advantages and disadvantages of ChatGPT to the students.

8.2 Advantages and disadvantages of ChatGPT

While there are ongoing debates surrounding the advantages and potential drawbacks of ChatGPT, both teachers and students shared their perspectives on its use. The feedback provided by these individuals tended to emphasize the benefits they experienced from using ChatGPT.

The responses of teachers are presented in Excerpt 4 to 6

Excerpt 4 “Student have better understanding on the topic, but they are depending on ChatGPT” (Respondent 1)

Excerpt 5 “It can be used productively to learn about new stuff and gain knowledge. I believe chatGPT is just like wikipedia intelligent search engine, where you can get desired knowledge base. As far as the disadvantage is concerned with the advent of ChatGPT students refrain from learning new concepts through exploration and rather prefer to cut, copy and paste answers.” (Respondent 8)

Excerpt 6 “Well for the advantages it is a great platform to investigate what's still unexplored or what is still being discussed in many other parts of the world. At the same time, it also leads to the disadvantage that the students do not want to put in efforts and stop using their brain because of the use of CHATGPT.” (Respondent 12)

These excerpts illustrate that ChatGPT offers numerous potential advantages. However, they also highlight teachers' concerns that students often resort to using it for content copying, which, in turn, has resulted in a reduced emphasis on fostering creativity and analytical thinking skills among students.

The responses of students related to advantages and disadvantages of ChatGPT are presented in Excerpt 7 to 9

Excerpt 7 “Advantage is it provides good content with less time usage. Disadvantage is ChatGPT only provide the content upto 2021 September and the latest version of the same is paid. So I personally think that it should be free for all.” (Respondent 4)

Excerpt 8 “Getting quick data for research saves time. The disadvantage is sometimes it provides incorrect or biased information”. (Respondent 7)

Excerpt 9 “Advantage of ChatGPT is that it provides more reliable content and user prompt searches but at the same time it is killing learning n creativity. Students don’t want to put any efforts.” (Respondent 8)

The above excerpts indicate that both teachers and students possess a keen awareness of the benefits and drawbacks associated with ChatGPT. Despite this awareness, they are actively utilizing it to reap various academic and professional advantages.

8.3 Ethical concerns associated with ChatGPT

As with many emerging technologies, ChatGPT is not exempt from ethical concerns. When questioned about their awareness of these ethical issues, a majority of the respondents acknowledged being cognizant of them. Subsequently, they were asked to elaborate on the specific ethical concerns they were familiar with.

The responses are presented in the excerpts 10 to 12

Excerpt 10 “the probable ethical concern can be Copyright issues as people just copy paste and mostly students use it for doing assignments.” (Respondent 3)

Excerpt 11 “The work is not genuine and it is a copied work. Anyone can do. And this will lead to theft of ideas in other words, which is unethical.” (Respondent 6)

Excerpt 12 “Possibility of plagiarism by teachers in delivering content to students and also in writing research papers”. (Respondent 9)

Additional ethical concerns related to ChatGPT were brought to light by other respondents. These concerns encompassed issues such as stifling creativity, potential intellectual property theft, and the possibility of discriminatory outcomes.

9. FINDINGS AND RESULTS

The current research explored the correlation between ChatGPT tools and its impact on the academic learning of students and qualitative academic delivery of teachers.

According to the research outcomes, respondents' personal attributes, including gender and age, did not seem to exert a notable impact on their perspectives regarding ChatGPT tool. Regardless of their gender and age, all interviewees shared a common belief that ChatGPT would serve as a valuable tool to complement and enhance human capabilities in the learning process, but individuals need to train on the usage of ChatGPT in a right way.

The research revealed that students view ChatGPT as a potent learning tool. However, it also uncovered that teachers are hesitant to embrace it for enhancing their academic content delivery.

Furthermore, the study delved into the different viewpoints held by students regarding ChatGPT.

- When students were asked about their primary utilization of ChatGPT for educational purposes, the majority stated that they primarily employ it to solve case studies assigned by their teachers, with a close second being composing emails and completing assignments.
- This survey yielded intriguing insights, with students acknowledging that ChatGPT delivers content in line with their expectations, leading to its frequent use. However, it was also accepted by students that ChatGPT has the potential to stifle their individual creativity and innovation when it comes to their learning methods.
- When students were questioned about the formal integration of ChatGPT into the educational environment, their response averaged at a rating of 2 out of 5. This suggests that a significant portion of the students have reservations or uncertainties about its potential to enhance their learning experiences.
- An essential revelation from this survey is that a significant number of students are actively using ChatGPT without being fully aware of the ethical concerns associated with it. They may not realize how ChatGPT can potentially compromise privacy, which highlights a critical gap in their understanding of the technology's implications.

The study yielded several findings regarding teachers' perceptions of ChatGPT.

- When teachers were queried about the primary purpose for which they utilize ChatGPT, the majority indicated that their main use is for rephrasing content, closely followed by generating educational materials for teaching.
- When teachers were questioned about their perceptions of the ethical concerns associated with ChatGPT, some expressed affirmative concerns. These included issues such as potential plagiarism, copyright violations, intellectual property theft, the possibility of generating discriminatory content, and the potential to hinder the learning process. However, it's worth noting that many teachers also acknowledged that students can harness ChatGPT productively to enhance their skill sets and facilitate more effective learning experiences.
- Most of the teachers believed that if students are instructed about the proper and responsible use of ChatGPT, it has the potential to offer numerous benefits and advantages to their educational journey.
- Another intriguing observation was that the majority of teachers acknowledged that ChatGPT contributes positively to their own learning and professional development processes.
- When teachers were inquired about their ability to identify content generated by ChatGPT in student assignments, a significant portion of them indicated that they could identify such content.
- When teachers were asked for their perspective on integrating ChatGPT into higher education as an additional teaching methodology, a significant majority held a negative view. Many of them argued that ChatGPT could stifle creativity and impede the development of critical thinking skills among students, citing these concerns as their primary reasons for opposing its adoption.

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