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Investigating Tertiary Students' Perceptions about ChatGPT use in Higher Education: Bangladesh Perspective

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Abstract: ChatGPT, a revolutionary AI tool, has significantly impacted higher education, although there is limited research on understanding why students use it and how they perceive its influence on their academic experiences. This study aims to bridge that gap by investigating Bangladeshi tertiary students' perceptions of ChatGPT use in higher education. Through a qualitative approach, it examines the perceived benefits, potential drawbacks, and factors influencing ChatGPT's acceptance, along with its impact on learning and cognitive development. In-depth interviews with 50 students from six renowned Bangladeshi universities, collected via convenience and purposive sampling, provide insights into students' perceptions of ChatGPT. Thematic analysis was conducted using Taguette software, followed by Excel coding to capture perceptions and effects. Findings reveal mixed reactions: some students acknowledge productivity and learning benefits, while others express concerns about over-reliance on AI and its potential effects on higher-order thinking skills. The study suggests that while ChatGPT integration in Bangladeshi higher education could enhance productivity, it requires careful regulation and standardization by educational authorities. Without such measures, students may become overly dependent on AI, potentially impairing critical thinking development. By focusing on both benefits and risks, this study contributes new insights and practical recommendations for stakeholders in Bangladesh's tertiary education sector.

Keywords: *ChatGPT, Students' Perceptions, Consequent Effects, Tertiary-level Education, Bangladesh*

Introduction: Higher education is one of the many sectors where artificial intelligence (AI) is becoming more and more prevalent. Whether utilized for staff support, tailored learning, smart educational systems, or computerized evaluation, AI technologies are becoming indispensable for higher education institutions [1,2]. With ChatGPT, teachers can enhance their lessons and students' learning. It won't take on the position of instructor. Rather, it provides them with more beneficial tools to strengthen them [3-5]. OpenAI unveiled ChatGPT, a massive language model-based chatbot, on November 30, 2022. It allows users to tailor and steer a conversation toward the language, length, style, structure, and information level they choose [6-8]. ChatGPT is a chatbot powered by artificial intelligence (AI) that mimics human speech through natural language processing [9,10]. The language model may write messages, articles, papers, codes, postings on social networking sites, and other written materials and respond to queries [11,12]. Modern chatbots utilize advanced knowledge-based models, while previous models concentrated on more basic string processing and pattern matching [13-15].

Chatbots have long been utilized in academic and informal education as well as in a range of administrative projects [16-19] to improve learning [20,21] foster student participation and evaluate students. However, educational chatbots come with a variety of limitations and challenges [22-27] resulting in a transactional experience that lacks human emotion and presents difficulties with handling typos, understanding slang, evaluating student work, and mimicking the flow of natural conversation. Moreover, some experts claim that a significant problem with educational chatbots that results in learning difficulties and frustration is the datasets' insufficiency [28]. With time, ChatGPT tends to lose its novelty effect [29,30]. The researchers also pointed out that it is difficult to compare study outcomes since ChatGPT lacks a uniform design procedure [31,32]. As stated by [33,34], ChatGPT's capacity to apply knowledge—effectively store and retrieve information—will dictate if it can be employed as a long-term learning tool. Service providers should give top priority when creating ChatGPT's features so that users can learn and browse "anytime and anywhere" and receive trustworthy information [35,36]. Writing computer code, doing literature reviews, coming up with research ideas, writing essays, and editing articles are just a few of the many jobs that ChatGPT can assist [37-40]. As ChatGPT gathers more data from user interactions, its potential should proliferate [41]. Higher education users have praised and criticized ChatGPT [42-44]. As with computers and calculators in math and science, some writers predict that ChatGPT and other AI-based apps will someday become indispensable to writing [45]. Therefore, others recommend leveraging these tools to facilitate collaboration between teachers and students on teaching and learning rather than outright forbidding them [46].

Several authors have found the advantages and disadvantages of ChatGPT for instruction at different educational levels [47-49]. Having stated that, ChatGPT can assist students in acquiring various abilities, such as researching, writing, reading, and critical thinking; it can also be used to create practice problems [50]. It makes remote and group learning easier for disabled students [51]. Furthermore, unlike search engines like Google, ChatGPT operates differently since it only retains the knowledge it acquired

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Table 3. Initial codes and Themes regarding ChatGPT use in Tertiary Level Education.

Initial Codes	Themes
Facilitating instant learning	PT1: Improving accessibility to learning
Providing support on complicated topics	
More engaging and interactive	
Finding potential areas of improvement	
Strong excitement/feelings	PT2: Creating enthusiasm and appreciation
Appreciating developers' efforts	
Better than other search engines	
going to transform learning, education, and acquiring knowledge	
Interesting to use	PT3: Creating Interest and Motivation
Creating motivation to use it more	
Human-like and friendly view	PT4: Conversation akin to humans
Answering naturally by this language model	
Simple to use	PT5: Simple to use and optimistic
Will eventually grow more potent	
Enhancing productivity at work	PT6: Improving efficiency
Advantageous to educational programs	
Raising the standard of learning	
Working well as a supplementary educational tool.	PT7: Favorable to learning
Favorable, effective, and useful for learning	
Giving recommendations for learning	
Well-organized responses	PT8: Better description and relevant
Relevant explanation	
Reducing cognitive abilities	NT1: Making human brains unproductive
Lessening reasoning, problem-solving, and critical thinking abilities	
Making overdependent on AI	
Erroneous searching results (not entirely dependable)	NT2: Providing erroneous answers
Requires upgrading	
Requires more relevance	
Decreasing teacher-student interaction	NT3: Adverse effects on learning
Becoming more passive in learning	
Facilitating fraud in exams and academic tasks	
Creating concerns for human employment	NT4: Might risk employment prospects
Creating challenges for the personnel at various levels	
Might disclose the search history publicly	NT5: Threatening privacy issues
Might disclose personal information	

Additionally, Others (4% of students) perceive that ChatGPT improves their efficiency by enhancing productivity at work and making it advantageous to educational programs (PT6). In addition, PT7 (4%) and PT8 denote ChatGPT is favorable to learning and provides a better description with relevance.

A sample of a few comments regarding ChatGPT's use in tertiary-level education is presented in Table 4. The comments against the themes are shown in this table.

Table 4. A sample of students' comments regarding using ChatGPT in Tertiary Level Education.\

On the other hand, a significant portion of students (15%) perceive that using ChatGPT excessively in higher education makes the students' brains unproductive (NT1). Furthermore, some students (6%) think that ChatGPT provides erroneous answers while searching for information from various perspectives (NT2). Students (5%) also believe that the use of ChatGPT might produce adverse effects on learning in the long run (NT3). 2% of students think that ChatGPT use can threaten employment prospects in the country (NT4), whereas other 2% students fear of losing privacy issues by using ChatGPT (NT5).

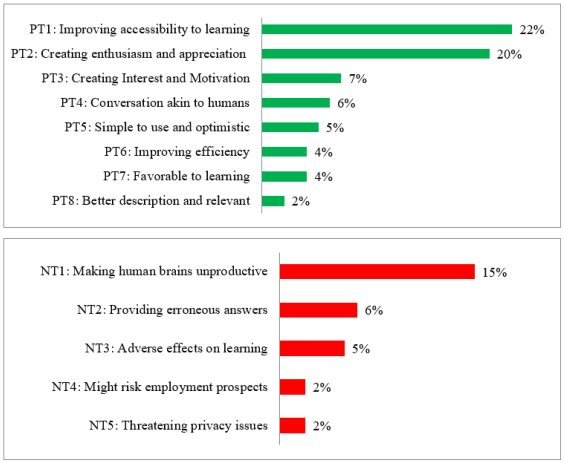

Fig. 3: Relative frequency of students' perceptions per theme regarding ChatGPT use in Tertiary Level Education (TLE).

Because of the theme analysis, the authors could create the questionnaire items and look at the range of viewpoints that the students had. The study can measure the extent of these perceptions because of student responses to the survey questions. Selected items were included in the questionnaire for each theme, as Table 5 highlights. Many of the items are directly extracted from the source code.

The average rate (AR) for every item in this survey is shown in Figure 4. Positive and negative themes are linked to most items with high and poor ratings. To be more precise, the positive-theme goods have an average rating of 4.08. On the other hand, the negative-theme items have an average rate of 3.37. Put differently, there is more robust agreement among the students regarding the positive aspects of ChatGPT.

Table 5. Questionnaire items per theme regarding ChatGPT use in TLE.

ChatGPT facilitates instant learning	PT1: Improving accessibility to learning
It provides support on complicated topics	
It has created strong excitement/feelings	PT2: Creating enthusiasm and appreciation
It is better than other search engines	
I find it interesting to use	PT3: Creating Interest and Motivation
I'm motivated to use it more	
I can get a "human-like and friendly view" perspective from ChatGPT	PT4: Conversation akin to humans
It's simple to use and I'm optimistic about it	PT5: Simple to use and optimistic
ChatGPT enhances productivity at work	PT6: Improving efficiency
It raises the standard of learning	
It performs well as a supplementary educational tool.	PT7: Favorable to learning
It's favorable, effective, and useful for learning	
It provides well-organized responses	PT8: Better description and relevant
The answers are mostly relevant	
Using ChatGPT constantly reduces the cognitive abilities of the students	NT1: Making human brains unproductive
It reduces reasoning, problem-solving, and critical-thinking abilities	
Students are becoming overdependent on AI	
It provides erroneous search results (not entirely dependable)	NT2: Providing erroneous answers
It requires more relevance	
It decreases teacher-student interaction	NT3: Adverse effects on learning
Students are becoming more passive in learning	
It facilitates fraud in exams and academic tasks	
It might create concerns for human employment	NT4: Might risk employment prospects
It's Creating challenges for the personnel at various levels	
It might disclose the search history publicly	NT5: Threatening privacy issues
It might disclose personal information	

The ARs of the positive items are as follows: ChatGPT facilitates instant learning (4.03), providing support on complicated topics (3.95), created strong excitement/feelings (4.21), better than other search engines (4.72), Interesting to use (4.5), motivated to use (4.12), human-like and friendly view (4.04), simple to use and making optimistic (4.01), enhancing productivity at work (4.07),

raising the standard of learning (4.05), performing well as a supplementary educational tool (4.17), favorable, effective, and useful for learning (4.26), providing well-organized responses (3.96), mostly relevant answers (3.09).

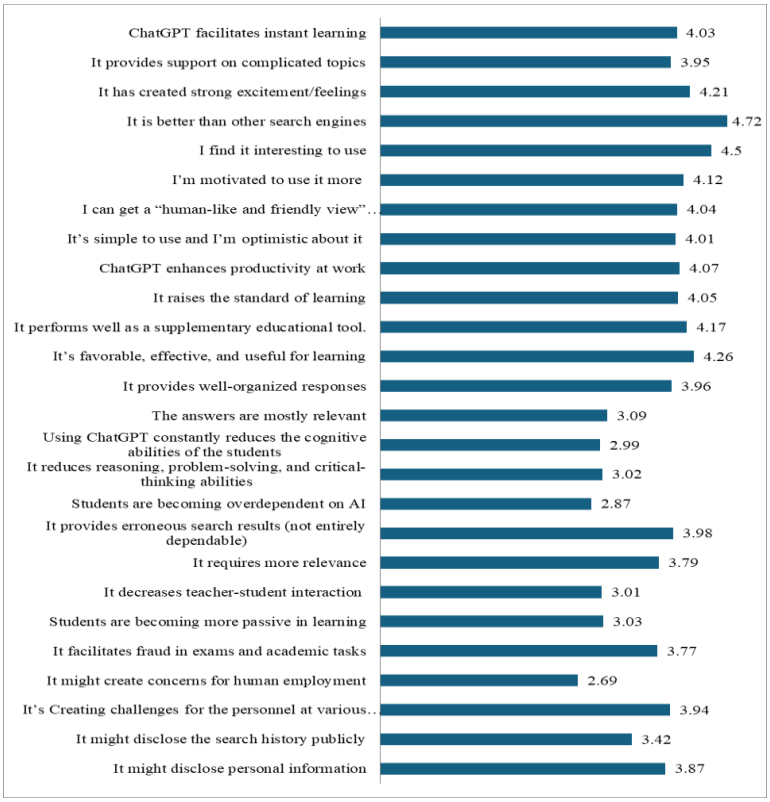

Fig. 4: Average Rates (AR) of the survey items of ChatGPT usage in TLE.

Most students—around 95%—strongly agree that ChatGPT is superior to other search engines. It has also generated strong feelings and excitement among the students. In contrast, students do not strongly agree with the statements that provide well-organized answers, and the answers are relevant enough.

The ARs of the negative items are as follows: Using ChatGPT constantly reduces the cognitive abilities of the students (2.99), reducing reasoning, problem-solving, and critical-thinking skills (3.02), becoming overdependent on AI (2.87), providing erroneous search results and not entirely dependable (3.98), requiring more relevance (3.79), decreasing teacher-student interaction (3.01), becoming more passive in learning (3.03), facilitating fraud in exams and academic tasks (3.77), might create concerns for human employment (2.69), creating challenges for the personnel at various levels (3.94), might disclose the search history publicly (3.42), might reveal personal information (3.87).

Students disagree with the statement, "Using ChatGPT constantly reduces the students' cognitive abilities". That means students perceive that using ChatGPT does not reduce their cognitive abilities. They also strongly disagree with another statement, "Students are becoming over- dependent on AI". On the other hand, they agree with the words "ChatGPT provides erroneous search results and is not entirely dependable, requiring more relevance, and other points having more than or equal to average ratings shown in figure 4.

Discussions on Findings: The emergence of large language models raises an essential concern for education: Will these models challenge or offer opportunities to the existing teaching and learning systems? In this scenario, students are the main actors. To answer this question, it is essential to understand their perspectives. The study participants' insightful and detailed comments on ChatGPT were very helpful in developing the questionnaire items. According to the research, most Bangladeshi tertiary-level education (TLE) students had positive thoughts about ChatGPT. The findings are supported by some other studies [115-118]. Students perceive that they can learn instantly using ChatGPT from various academic perspectives. They can have an opportunity to understand the unknown or cursory topics immediately with the help of ChatGPT. Other scholars [119,120] also found similar results to this study. Moreover, this study reveals that students benefit from understanding complicated topics. Along with that, students see ChatGPT as better than other search engines. After a while, these ChatGPT features start to inspire pupils. Additional research supports these findings [121,122]. In contrast, several studies found negative impacts of ChatGPT in higher education [123, 124]. This study discovers that students can get a "human-like and friendly view" perspective from ChatGPT, and it's

straightforward to use. [125,126] also found the similar results. Keeping pace with these findings, this study finds more positive perceptions and merits of ChatGPT, including productivity and standard enhancement at learning and providing well-organized responses. Several studies support these findings [127,128]. In the case of relevance in answers, students perceive that the significance levels with topics are not up to the mark, and it sometimes provides erroneous results. Some scholars also got similar findings [129,130]. Thus, ChatGPT's answers cannot be taken as one hundred percent correct. Instead, offering students various options or early drafts of a specific response can assist students as a helpful learning tool.

Students moderately agree with some comments; for instance, ChatGPT cannot be a substitute for teacher-student interaction but makes students somewhat passive in learning, might create concerns for human employment in some cases, and might disclose the search history and personal information in the future. Scholars also found similar results [131,132]. Finally, this study presents that the students at TLD in Bangladesh have mixed perceptions regarding using ChatGPT in their learning. In comparison to the negative perceptions, the levels of positive perceptions are higher. Thus, if students can use the ChatGPT with positive intentions and humanize the information, they can benefit themselves from various perspectives.

Implications

Managerial Implications: Despite its mediocre response accuracy, students regard ChatGPT as an easy-to-use tool. About it, they experience motivation, inspiration, curiosity, and optimism. Teachers should consider how to make the best use of this educational resource. They must investigate the advantages and disadvantages of ChatGPT in their domains and instruct students on its valuable applications. An educational psychology study is required to determine what makes ChatGPT so alluring and what can be done to keep students interested in this platform. According to this study, a few things that must be considered are human interaction and the level of explanation. The education sectors in Bangladesh can focus on integrating this learning tool into tertiary-level education sectors to ensure more productivity. However, the higher education authority must have controlling measures and standard maintaining procedures while combining it with education sectors. All the stakeholders should be well aware of ChatGPT before installing it in education. The teachers and students must know at which levels the benefits of ChatGPT can be welcomed. Students living in remote places or with learning disabilities may find this especially helpful. The findings highlight the need for regulatory frameworks to guide ChatGPT use in Bangladeshi higher education, ensuring that AI tools are used responsibly and productively. Educational authorities could develop policies that encourage ChatGPT's beneficial use while reducing risks of over-reliance. These insights also suggest that curriculum designers could integrate ChatGPT thoughtfully, using it as a supplement for personalized learning while preserving critical thinking components. Instructional strategies might include ChatGPT for specific tasks, like brainstorming or research support, to enhance learning without compromising essential skills. To maximize the tool's benefits, institutions could provide training for both students and faculty on effective and ethical AI use, helping them understand its capabilities and limitations. This training would also guide faculty in integrating ChatGPT responsibly as a complementary resource in their teaching. Furthermore, strengthening academic integrity protocols becomes essential, as ChatGPT can easily be misused for assignments. Institutions could enhance plagiarism policies, develop AI detection methods, and design assessments that prioritize originality, encouraging a balanced approach to AI in education. Finally, since ChatGPT use raises privacy concerns, institutions should establish data security measures and educate students about privacy risks, promoting trust in AI-integrated learning environments.

Theoretical Implications: The literature on ChatGPT's case and Bangladeshi tertiary students' perspectives will be enhanced by this study. The study also brings fresh perspectives to this sector. ChatGPT can personalize learning experiences to each student's needs and pace, which could lead to improved knowledge and engagement by providing explanations, feedback, and appropriate practice at the proper level. The students at the tertiary level of education in Bangladesh agree on the positive and negative features, perceptions, merits, and demerits of ChatGPT. The education sector can benefit its stakeholders by adequately using this learning tool. A growing number of stakeholders are using this learning tool in various sectors. Consequently, it has been advantageous for the respective parties. The demerits of ChatGPT might be avoided, and the positive features can be received to enhance the standard and productivity in education. By investigating how ChatGPT affects students' engagement and cognitive development, the research adds to Constructivist Learning Theory, emphasizing the role of active learning with AI. It also provides a deeper understanding of how students balance AI use with traditional learning, adding nuance to constructivist perspectives on technology-enhanced education. Furthermore, the study offers insights for Social Cognitive Theory (SCT) by examining the influence of ChatGPT on students' behavior and motivation, shaped by social and environmental factors in academic settings. These findings can help SCT scholars understand the effects of AI on learning and social dynamics in education. Additionally, the study contributes to the Critical Theory of Technology by highlighting the empowering yet limiting aspects of ChatGPT, revealing how technology may shape student agency. This can inform discussions on the ethical and societal impacts of AI in higher education, helping theorists address broader concerns.

Limitations and future research directions: This study has some limitations, so it's essential to address them with future research directions. The respondents are mainly from a few public and private universities in Bangladesh. If all Bangladesh universities are considered, the results might be different. This study primarily focuses on qualitative analysis, whereas quantitative research might generate additional findings with other features. Additionally, the study explores students' perspectives on using ChatGPT in the classroom. Here, the results may alter if the opinions of educators and other stakeholders are quantified. Moreover, most of the respondents are from business and social sciences backgrounds. Thus, the perceptions of students from other backgrounds might be different. Future research in this field can include respondents of all backgrounds to

get more accurate results. Besides, specific results can be drawn focusing on groups regarding ChatGPT use in tertiary-level education sectors. This study's use of convenience and purposive sampling limits generalizability, as it may not fully represent Bangladeshi tertiary students. The reliance on qualitative interviews and thematic analysis introduces subjectivity, potentially influencing the interpretation of students' perceptions. Findings may also become outdated as ChatGPT evolves, and the study does not consider faculty or administrators' perspectives, which could provide a more comprehensive view. Future studies could use a larger, more diverse sample and include quantitative methods to statistically analyze ChatGPT adoption factors. Including faculty and administrative perspectives would offer a broader understanding, while longitudinal research could track changes in perceptions as ChatGPT develops.

Conclusion: In this study, the authors examine how students in tertiary-level education sectors perceive ChatGPT in their learning. The findings are drawn using a qualitative analysis of collected interviewed data from different public and private universities. The results show mixed perceptions of students regarding ChatGPT use in higher education. Despite limitations, ChatGPT can benefit its users from various perspectives. The stakeholders should know its merits and demerits while using this learning tool. The concerned authority can integrate this learning tool to excel in education by avoiding negative features and receiving positive ones. In conclusion, this study provides valuable insights into Bangladeshi tertiary students' perceptions of ChatGPT and its potential impact on higher education. Through qualitative analysis, it highlights both the benefits and concerns associated with ChatGPT use, such as enhanced productivity and learning support, alongside issues like over-reliance and challenges to critical thinking. The findings suggest that while ChatGPT has the potential to assist students in educational tasks, there are significant concerns about academic integrity and the need for responsible use. This underscores the importance of developing regulatory frameworks to guide its integration into education effectively. By exploring ChatGPT's perceived advantages and risks, this study contributes to technology acceptance theories and provides a cultural perspective on AI in education. It also calls attention to the evolving role of AI in academic environments, urging stakeholders to balance technological innovation with educational integrity. Limitations of the study, such as sampling constraints and evolving technology, suggest that further research is needed to validate and expand these findings. Overall, this research serves as a foundation for educational policy discussions and future studies on the integration of AI tools like ChatGPT in higher education.

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