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Artificial Intelligence in Higher Education: The Effectiveness of ChatGPT from the Perspective of Islamic University Students in Kushtia, Bangladesh

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Artificial Intelligence (AI), ChatGPT, Islamic University, Higher Education, Bangladesh

ABSTRACT

This study investigates the effectiveness of ChatGPT- an AI chatbot- from the viewpoint of Islamic University students in Kushtia, Bangladesh. It studies how ChatGPT impacts their academic performance, engagement, and learning outcomes. A mixed-method approach was employed; surveys were conducted, and results were analyzed using SPSS 25 and MS Excel 2019. The findings indicate that ChatGPT greatly improves academic results since the students were highly satisfied with it in terms of accuracy, ease of use, and enhancement in critical thinking. The study highlights the future possibilities that it may possess with respect to research work by the students and their concentration on study sessions. Basically, certain issues relating to academic integrity and ethical concerns have also been discussed. This research fills that gap by looking at some perceptions and uses of AI tools like ChatGPT in higher studies, especially in the context of Islamic universities in Bangladesh.

1. Introduction

AI refers to the science and engineering of developing computer systems that are capable of performing tasks that require some application of human intelligence in the past, like speech recognition, decision-making, and pattern recognition. Education, in its eternal metamorphosis, is influenced by the introduction of new technologies that have the potential to revolutionize the way we teach and learn (Haleem et al., 2022). To students, AI-driven chatbots such as ChatGPT are gaining acceptance and are now having the strongest impact on students' academic work. Integration of AI chatbots into online learning for improved learning outcomes and student engagement is now an area of research within educational institutions. ChatGPT, the most recent AI-driven chatbot, stands to gain huge limelight as it can generate complex text while conversing meaningfully with the user. ChatGPT is at the forefront of this new development. In a way, the launch of ChatGPT by OpenAI in November 2022 symbolizes a watershed event in conversational AI history in the annals of AI history. Educators obtained a variety of the ability to respond upon seeing its extraordinary capabilities, asserting its transformational effect on the educational experience (Baidoo-Anu & Owusu Ansah, 2023). In academia, the tool acts as a versatile assistant for all tasks imaginable by students, including essay writing, brainstorming research ideas, conducting comprehensive literature reviews, improving written documents, and even coding (Owens, 2023). In the past few years, with the help of ChatGPT, there has been a notable improvement in students' language skills. Bonsu and Baffour-Koduah (2023) have put forward a premise that is indeed fascinating: students can use ChatGPT to pose questions only to receive immediate feedback, thus building their vocabulary and grammatical skills. Hence, the researchers sought to assess students' perspectives and

intentions toward employing ChatGPT in Ghanaian higher education. Students manifested positive attitudes toward ChatGPT and great intentions toward its use, with significant arguments for its application in education. Nevertheless, the advent of ChatGPT heralds new and immediate threats to the house of education. With its capability to give precise answers to user questions, concerns have been raised about its possible exploitation to complete written tasks and exams for students, thus agitating the debate on AI-assisted academic dishonesty. The emerging concerns associated with the advancement and impacts of AI in teaching and learning, especially concerning chatbots like ChatGPT, have drawn closer attention from higher education stakeholders and scholars of the teaching and learning enterprise. Some of the vital issues of concern are those related to assessment validity, examination integrity, and ethical considerations (e.g., Eke, 2023; Rudolph et al., 2023; Vincent-Lancrin & Van der Vlies, 2020; Yeadon et al., 2023). ChatGPT is colossal in its scope because, with it, the way human beings communicate with technology could witness a dramatic turn. Its efficiency and cost-effectiveness in automating responses and improving user experience make it an exciting way to elevate assistance. Many research works are oriented toward determining college students' thoughts about available artificial intelligence chatbots. However, the understanding gap still remains concerning the way students view, use, and interact with such artificial intelligence platforms like ChatGPT in the context of the university, owing to the fact that previous studies have mostly provided a broad approach to technology in education and looked at specific applications. Thus, this research intends to fill this gap by investigating students' views and experiences of using the ChatGPT application for college purposes.

2. Literature review

ChatGPT and similar generative AI technologies can provide interesting scenarios in learning and collaborative problem-solving toward accomplishing goals among students, further fostering a sense of community. It appears that ChatGPT has immense potential to back up and facilitate interventions by educators and students as well as other groups (Baidoo-Anu & Ansah, 2023). Most studies rather seriously accounted for the efficiency and promise of the ChatGPT in published research literature. As stated in the study by Omar Ibrahim Obaid et al. (2023), ChatGPT may be used to underpin research in generating new ideas, offering a much-needed perspective and productivity-enhancing aspects. It encourages research and development, shaping innovative solutions and cultivating innovative ideas among the inter-domain. Lopping from Kuzdeuov et al. (2023): now, it is clear that ChatGPT can speak to the visually impaired, and this is an advancement in making digital content more accessible. Nevertheless, this position of ChatGPT should make it one of the major tools for research that searches for real ethics in AI by handling vital problems, such as bias and misinformation. As in the search engine functionality of ChatGPT, witnessed by Aljanabi et al. (2023), it helps in terms of generating questions for which users would get equally relevant and accurate responses, hence enhancing knowledge retrieval. While walking the thin line of ethical considerations that must surround the emerging landscapes of AI technology, it is imperative to examine the potential and possibilities of ChatGPT in deducing its future as a story of integrity and human-machine experience. From education to health to all portions of human life, the applications of ChatGPT are warded. In education, it could be employed to design a chatbot and online tutor to help students improve their language proficiency(Bosic & Poola, 2023). No wonder in agriculture, ChatGPT supports farmers by having a grip on precision farming, crop diseases and pest diagnosis, crop forecasting, and crop and soil analysis (Biswas, 2023). Therefore, the advent of ChatGPT is seen as a power of change to an extent, lingering in the classroom and beyond. One such model, ChatGPT, was developed by an organization named OpenAI and attracted worldwide attention among researchers in the field of education. This marks an AI-driven tool trained to produce human-like text on the basis of the written prompt. Enormous, the journey of literature from the many studies conducted to ascertain the applicability of ChatGPT across the disciplines, which include medical education, higher education in Ghana, construction hazard recognition and safety training, critical thinking skills, and epistemology, have produced encouraging results. Huh (2023) states that ChatGPT was as good as medical students in a parasitology examination, hence its possible application in medical education. Raman et al. (2023) listed factors that influenced students' intentions to use ChatGPT for higher education, thereby giving some insights to educators on how to better use this application. Uddin et al. (2023) demonstrated the way ChatGPT has been instrumental in achieving safety-related curricular goals in construction hazard recognition and safety education. Mejia and Sargent (2023) cited its usefulness in developing higher-order critical thinking by providing experiences that complement direct ones for higher-order task engagement. Theoretical framework Halaweh (2023) analyzes the potential of ChatGPT to influence conventional forms of assessment in higher education, stressing the need for promptness and making some recommendations to ensure the ethical and operational use of ChatGPT. Adiguzel et al. (2023) observed that ChatGPT is a machine-learning-based system that generates anticipative recommendations, auto-problem-solving, and customized counseling through the extraction of data from a variety of sources.

Several studies worldwide have examined artificial intelligence in higher education. But there are no studies in this area. As such, the present study is on Artificial Intelligence in Higher Education: The Effectiveness of ChatGPT from the Perspective of Islamic University Students in Kushtia, Bangladesh.

Research objectives

1. To discuss the AI, ChatGPT, AI development stages, models in machine learning, etc.
2. To analyze empirically Islamic university students to understand the effectiveness of ChatGPT.

2.1 Theoretical overview

2.1.1 What is Artificial Intelligence (AI)?

Artificial intelligence has only recently become important for students and researchers as it is believed to be one of the major technological advancements taking place around the world. The term was originally coined by John McCarthy during the Dortmund Conference of 1956 (Arslan, 2017). The expected interdisciplinary cross-fertilization includes computer sciences, control theory, information theory, neurophysiology, psychology, logic, and philosophy (Wei, 2018). AI was meant to mimic and enhance human expression, which has undergone significant changes over the years (Shi & Zheng, 2006). Akyürek (2013) defined AI as a machine that simulates human reasoning, argumentation, learning, sense-making, communication, decision-making, and generalization. More broadly, AI deals with systems sufficiently analytic to mimic life itself (Gordon, 2011).

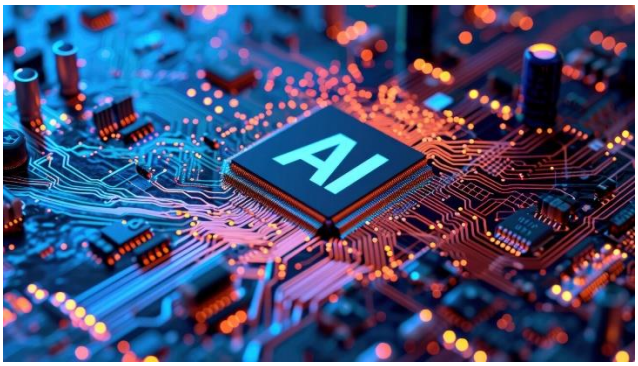

Fig.1. AI (Source: google photo)

In fact, AI consists of multiple definitions distributed in literature, which either emphasize one dimension of acting human or the other (Arslan, 2017; Büyükgöze & Dereli, 2019). AI, both in its environment and in its appliances, has changed human life. Life today is becoming more and more affected by developments in AI, from searching the net to using apps on a smartphone to the realm of public transport and driverless vehicles. AI will, and truly should, play an important aspect in the control and decision-making processes for human beings across many areas, among those being healthcare, engineering, design, military, psychology, energy, mining, agriculture, meteorology, and forensic science (Sarıca, 2021). Also, investments in AI in several sectors are growing rapidly. If used in the right way and with effectiveness, AI tools can bring significant advantages to higher education (Taşçi & Çelebi, 2020). Indeed, however, the efficient integration of AI applications into education is still a matter of debate. With AI slowly but surely coming into educational settings, investment and research will most likely pick up significant momentum in the coming years (İşler & Kılıç, 2021).

2.1.2 What is ChatGPT?

Cutting-edge technologies are rapidly improving, introducing new applications and innovations into our lives. Among these, artificial intelligence (AI) has come into quite a bit of prominence in the recent past due to heavy research and development. Perhaps one of the most well-known modern applications of AI is the AI chatbot, creating answers almost humanlike to queries put by the user, using deep learning algorithms trained with several large datasets(Gilson et al.,2022). An impressive instance of human-computer interaction was seen in the public launch of ChatGPT in

November 2022, where state-of-the-art technology was used(Cotton, Cotton & Shipway, 2023; de Winter,2023; Topsakal & Topsakal, 2022; Wenzlaff & Spaeth, 2022; Zhai, 2022). This AI model developed by OpenAI as a 175-billion-parameter natural language processing (NLP) system is a magnificent example of the ongoing evolution in the fields of artificial intelligence technologies (Gilson et al., 2022). ChatGPT, a mature NLP engine with thousands of configurations, is listed as one of the largest language models available today (Cotton, Cotton & Shipway, 2023). OpenAI, which was given birth in 2015 by prominent personalities in the industry, is a non-profit research company that concentrates on getting along with the advancement of AI technologies. The institute is known for various research undertakings and for its capacity to coexist with ChatGPT, an optimized language model capable of conversational responses to inappropriate queries, falsifying wrong assumptions, admitting errors, and learning from its errors-(Jiao et al., 2023). The technology is thus an amalgamation of deep learning and natural language processing, where it draws from many datasets and simulates human-like text generation(Qadir, 2022).

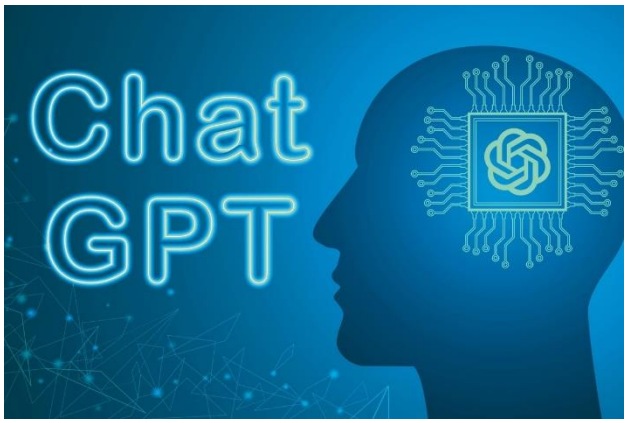

Fig.2. ChatGPT (Source: Google Photo)

Initially ridiculed for its inadequacy in delivering accurate facts, this source of rich and lucid answers emerged in the context of the questions posed by users. This AI code thereby serves as a type of NLP that reads and formats text using the GPT-3 text interpreter (Pavlik, 2023). These naive-sounding texts convey the deep learning-natural language processing hybrid into a variety of datasets from which human-like text is produced. As stated by Güçlütürk in 2022, the output generated by ChatGPT depends on the previous input provided, and even if the same command is entered again, the output may change places. Hence, ChatGPT produces highly personalized and original content based on the users' input along with the given sources (Wenzlaff & Spaeth, 2022). ChatGPT has been built to interact and communicate with users closely, resembling human communication, and enable multilingual responses (O'Connor & ChatGPT, 2023; Wenzlaff & Spaeth, 2022). ChatGPT was originally meant for online customer support. Nowadays, it has expanded to other various applications. Growing usage is being seen in health care, software development, content creation, language translation, increasing business efficiency, cutting costs, and AI-enabled customer service. (Gilson et al., 2022; Qadir, 2022). It may be presumed that AI and chatbots will still develop with technology. ChatGPT technology, which is made for conversing with a user and providing meaningful responses to the user's inquiries (de Winter, 2023), is going to evolve and become all the more breathtaking in the future (Qadir, 2022). The unique feature of a lovesome ChatGPT, which has impressed millions of users in a very short time, is real-time instantaneous delivery of answers to user's queries (Qadir, 2022). Another great feat is its ability to write high-quality, flawless text, indistinguishable from that of a human pen (Susnjak, 2022). Like other productive AI systems, ChatGPT gives answers to questions in a flash while maintaining a coherent meaning. However, the answers are not always correct or appropriate and are often riddled with erroneous and biased references (de Winter, 2023; O'Connor & ChatGPT, 2023; Qadir, 2022). It is also known that ChatGPT contains limited information about what happened after the year 2021. Yet, the more bots like ChatGPT, which are believed to improve with time and fine-tune themselves, the more such challenges are likely to be reduced.

2.1.3 Stages of AI development

The development of AI can be broadly understood through four major stages. These are following

Reactive machines: The weakest form of AI is only reactive to stimuli according to fixed rules coded into it. Since it does not utilize memory, it cannot learn from new input. An example of a reactive machine was IBM's Deep Blue, which in 1997 defeated chess champion Garry Kasparov.

Limited memory: Most AI applications in use today may be classified as limited memory systems. Such systems may learn from experience, i.e., new data fed into them via an artificial neural network or any other training model through any sort of learning paradigm. Limited memory artificial intelligence may be classified as Deep Learning.

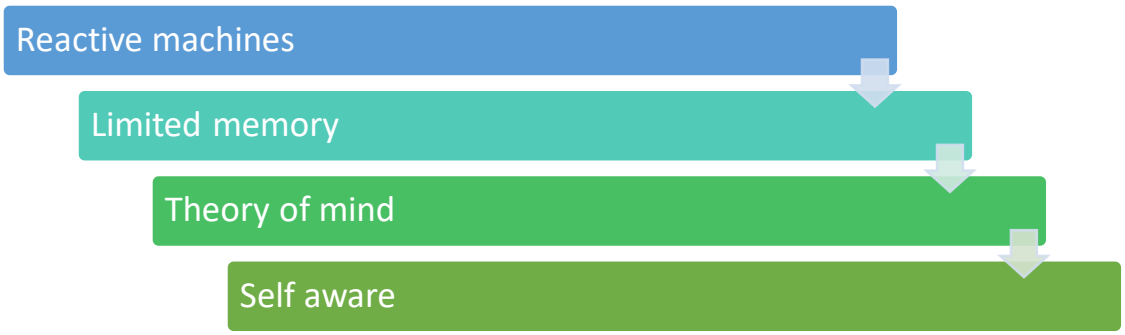

Fig.3. Stages of AI development (Source: Author)

Theory of mind: *Not* only is the theory of the mind not implemented in designs, but a lot of research is also done around its feasibility. This describes AI, which has been able to imitate the human mind and would thus be able to hold decisions similar to that of a human, which would imply recognizing and recalling emotions, as well as responding to social situations just like a human.

Self aware: Taking a step further from theory, we can define self-aware AI as the hypothetical machine that fully acknowledges its own existence and possesses the intellectual and emotional faculties of a human. Self-aware AI does not exist at this point in time, just like theory-of-mind AI.

2.1.4 Learnings models in machine learning

From the perspective of machine learning, ***supervised learning*** takes the model under consideration to make a mapping of a specific input to an output based on labeled training data (i.e., structured data). Thus, cats are fed with images labeled as cats to train an algorithm to recognize cat images.

In contradistinction, ***unsupervised learning*** is a kind of machine learning model that learns from non-labeled data (unstructured data). The end result is not known. Rather, the algorithm learns from the data and organizes it into groups based on certain features. For example, things like pattern matching and descriptive modeling are best done by supervised learning.

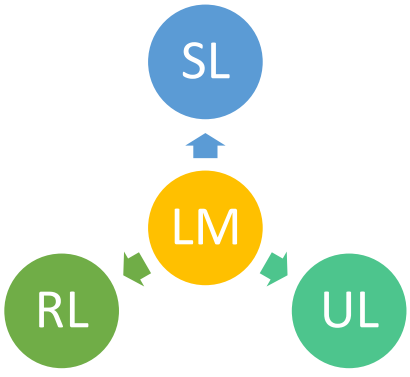

Fig.4. Learnings models in machine learning (Source: Author)

A third method, mostly based on a combination of the two preceding methods, is semi-supervised learning. Here, only some of the data are labeled. The expected answer is known in semi-supervised learning, but the learning algorithm has to figure out how to organize and structure the input data to obtain that answer.

Reinforcement Learning Models are those machine learning models that can briefly be defined as "learning by doing." In this, one "agent" learns to perform a certain action by trial and error, through feedback loops, in order to progress the task to an acceptable level. Positive reinforcement is given for successful actions, while negative reinforcement is given for poor performance. A typical example of reinforcement learning is when a robotic hand is taught to pick up a ball.

2.1.5 Types of artificial neural networks

Feedforward neural networks (FF): Feedforward style neural networks are by far the earliest approaches to neural networks. Data is taken through layers of artificial neurons in a unidirectional fashion, ultimately producing an output. In modern lingo, most feedforward ANNs are referred to as "deep feedforward" for those with more than one hidden layer. In general, feedforward neural networks involve learning through some type of error correction algorithm, one form being backpropagation, which may be understood simply as this neural network's output gets assessed, then moving backward through all the interconnections, errors are found to enhance the neural network's accuracy. There are quite a number of simple yet powerful neural networks that can collectively be designated as deep feedforward.

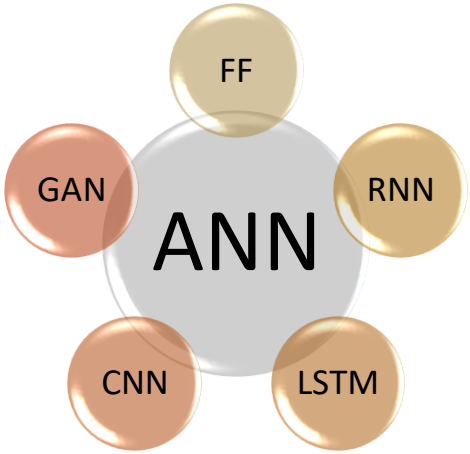

Fig.5. Types of artificial neural networks (Source: Author)

***Recurrent neural networks (RNN)*:** Unlike a feedforward neural network, RNN uses sequential data or time series data most of the time. In contrast to the feedforward neural network activation of weights in every node of the network, an RNN has a "memory" of what occurred in the previous layer relative to the output of the present layer. In doing so, RNN can somehow "remember" other words in a sentence for natural language processing. These RNNs find applications when recognizing speech, translating text, and captioning images.

Long/short-term memory (LSTM): LSTMs are essentially advanced RNNs that have some memory and can remember what happened in earlier layers. Though RNNs can remember some information, LSTMs extend this capability because LSTM memory cells can remember what happened many layers back. They were primarily used for speech recognition and prediction tasks.

Convolutional neural networks (CNN): Convolutional neural networks (CNNs) are one of the earliest and most popular types of artificial neural networks. CNNs designed mainly to solve image recognition tasks are multilayer networks composed of a convolutional and pooling layer, which extract and separate different features of an image before passing it to a fully connected layer. Early convolutional layers involved the detection of basic features, colors, and edges, while more complex patterns and structures were characterized by activation in the deeper layers.

Generative adversarial networks (GAN): Generative adversarial networks are a kind of artificial intelligence. One of the neural networks is referred to as the generator, which sends fake images to the other network, called the

discriminator, which tries to detect that they are indeed fake. This competition gradually improves the accuracy of both networks. Hence, GANs have been used to generate very realistic images; several artists have even used GANs to create their own art.

3. Methodology

This study is mainly descriptive and aims to provide a thorough understanding of the subject matter. This study collects qualitative and quantitative data, thus allowing for a greater multifaceted analysis of the research topic. Data collection involves utilizing both primary and secondary sources. The collection of primary data was facilitated through Google Forms. In this research, we used Likert scale questions where 1= Strongly Disagree and 5= Strongly Agree. The data analysis tools used SPSS 25 and MS Excel 2019 to provide the findings of this study. It also included secondary studies as the methodological basis for research. The authors reviewed and analyzed various existing literature, such as research articles, journals, and books, highlighting Artificial Intelligence in higher education.

3.1 Variables of research

Dependent variable Y: The use of ChatGPT has contributed to enriched academic performance.

Independent variables:

X1: ChatGPT delivers correct information for coursework.

X2: ChatGPT improves the ability to complete tasks professionally.

X3: ChatGPT is a user-friendly tool for academic purposes.

X4: ChatGPT supports critical thinking by offering diverse perspectives.

X5: ChatGPT is a credible tool for research-based tasks.

X6: ChatGPT consistently delivers dependable responses.

X7: ChatGPT helps maintain focus during study sessions.

X8: ChatGPT's responses are clear and applicable.

Multiple variables have been analyzed to ascertain the dependent variable: "The use of ChatGPT has contributed to improved academic performance" (Y). Independent variables (X1 to X8) are analyzed to estimate their effect on the dependent variable (Y). In this study, a survey questionnaire was developed to collect data from the population, with 160 respondents participating. The questionnaire was administered to presently enrolled students of the Islamic University, Kushtia, Bangladesh. A summary of the demographic profiles of the respondents is presented in the following figure.

Figure-06: Gender of respondents

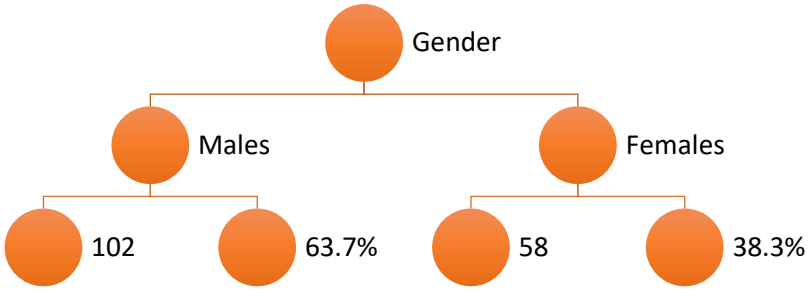

Figure 6 represents the frequency and proportion of respondents' genders. Analysis of the figure indicates that males are 102 (63.7%) and females are 58 (38.3%). The total number of respondents is 160.

Figure-07: Marital Status of respondents

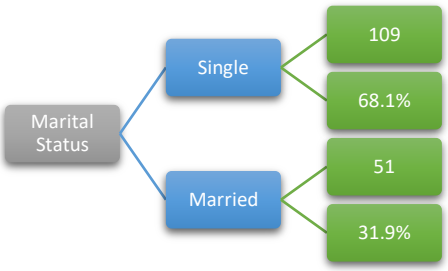

Figure 7 represents the frequency and proportion of respondents' marital status. Analysis of the figure indicates that single is 109 (68.1%) and married is 51 (31.9%). The total number of respondents is 160.

Figure-08: Income of respondents

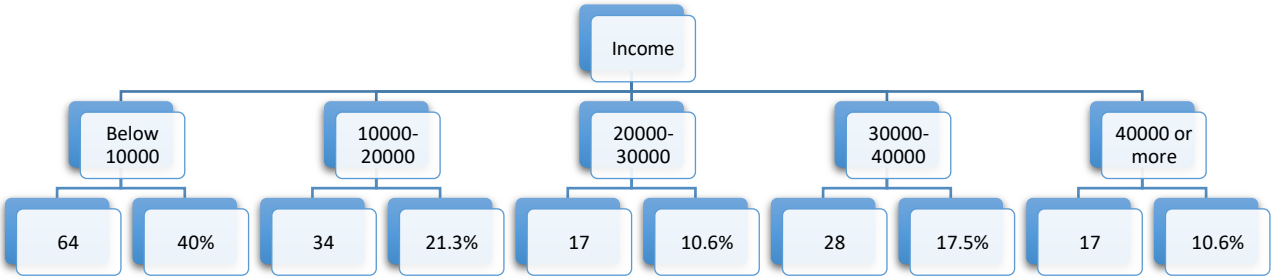

Figure 8 represents the frequency and proportion of respondents' income. Analysis of the figure indicates that below 10,000 is 64 (4o%); 10,000-20,000 is 34 (21.3%); 20,000-30,000 is 17 (10.6%); 30,000-40,000 is 28 (17.5%) and 40,000 or more is 17 (10.6%). The total number of respondents is 160.

4. Result and Discussion

4.1 Reliability Test (Using Cronbach's Alpha Technique)

The dependent variable, "ChatGPT has contributed to improved academic performance ." served as the basis of data collection. "SPSS 25" was used to evaluate the collected data from the respondents. The relevance of the data was evaluated by utilizing Cronbach's alpha statistics obtained from processing the data set. The following shows reliability analysis through the technique of Cronbach's Alpha:

Reliability Statistics	
Cronbach's Alpha	N of Items
.874	9

Table 1: Reliability Analysis. Using Cronbach's Alpha technique (SPSS 25).

The Cronbach's Alpha test was employed to calculate and confirm the consistency of the items (Zikmund and Babin, 2020). A Cronbach's Alpha score of 0.70 or higher is considered acceptable for an exploratory study to ensure the reliability of the data (Malhotra, 2010). As per the results of the study, the reliability score of the 9 items identified stands at .874, indicating that the data is highly reliable.

4.2 Descriptive Statistics

Descriptive statistics is a term that refers to measures that describe and present data meaningfully so that the underlying information is much easier to interpret. Among measures of central tendency, the Mean or average method is more popular for indicating the center of distribution (Malhotra, 2010). Standard deviation is a term used to observe how the data varies from the mean value (Boone, H.N. and Boone, D.A. (2012). They represent the 5-Point Scale mean Classification.

Five (5) Point Scale Mean Classification (Boone, H.N. and Boone, D.A. (2012).

Sl.	Mean Score	Interpretation
1	1.00-1.80	Very Low / Strongly Disagree
2	1.81-2.60	Low / Disagree
3	2.61-3.40	Moderate / Neural
4	3.41-4.20	High / Agree
5	4.21-5.00	Very High / Strongly Agree

Table 2: five (5) Point Scale Mean Classification (Source: Boone, H.N. and Boone, D.A. (2012).

4.3 Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
X9: ChatGPT has contributed to improved academic performance	4.46	.823	160
X1: ChatGPT provides accurate information for coursework	4.56	.707	160
X2: ChatGPT enhances the ability to complete assignments professionally	4.13	.742	160
X3: ChatGPT is a user-friendly instrument for academic purposes	4.43	.813	160
X4: ChatGPT supports critical thinking by offering diverse viewpoints	4.42	.739	160
X5: ChatGPT is a credible tool for research-based tasks	4.20	.699	160
X6: ChatGPT consistently delivers dependable responses	4.49	.709	160
X7: ChatGPT helps maintain focus during study sessions	4.51	.682	160
X8: ChatGPT's responses are clear and applicable	4.49	.727	160

Table 3: Descriptive Statistics (SPSS 25)

Table 3 is a table of descriptive statistics that aimed to communicate the mean and standard deviation estimates for the ten predictor variables. The study has seen that the mean value of the dependent variable (X9) is 4.46. The value indicates that ChatGPT has contributed to enhanced academic performance among Islamic University Students. The mean value of other variables, such as

X1: Provides correct information, which is 4.56, which indicates that they strongly agree with the statement.

X2: Ability to complete assignments professionally is 4.13 which indicates agree with statement.

X3: User-friendly instrument is 4.43 that indicates strongly agree with statement.

X4: Supports critical thinking by offering diverse viewpoints is 4.42 that indicates strongly agree with statement.

X5: A credible tool for research-based tasks is 4.20 that indicates agree with statement.

X6: Delivers dependable responses is 4.49 that indicates strongly agree with statement.

X7: Helps maintain focus during study sessions is 4.51 that indicates strongly agree with statement.

X8: Clear and applicable is 4.49 that indicates strongly agree with statement.

4.4 ANOVA test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.244	8	5.405	12.664	.000[b]
	Residual	64.450	151	.427		
	Total	107.694	159			

a. Dependent Variable: X9

b. Predictors: (Constant), X8, X2, X4, X3, X7, X5, X6, X1

Table 4: ANOVA test (SPSS 25)

a. Dependent Variable**:** The use of ChatGPT has contributed to improved academic performance.

b. Predictors: (Constant**),**

X1: Accurate information for coursework.

X2: Ability to complete assignments professionally.

X3: User-friendly instrument

X4: Supports critical thinking

X5: Credible tool for research-based tasks.

X6: Delivers dependable responses.

X7: Helps maintain focus during study sessions.

X8: Clear and applicable.

In Table 4, We shall proceed to determine if there is any relationship between the dependent and independent variables by carrying out a variance test on the variables included in the model. The statistical proof at a 95% confidence level (p-value =.000) vouches for the model's significant nature (Hossain *et al., 2025*). Also, because $p < 0.05$, the model is significant, indicating that at least one of the independent variables (X1 to X8) has a significant relationship with X9.

5. Discussion

It was learned from the study that ChatGPT is quite effective for academic task support, with students strongly concurring with statements that ChatGPT provides accurate information, adds value to assignment completion, and aids in their critical thinking. The grand mean scores for all the dimensions indicated a higher perception of using ChatGPT, scoring anywhere between 4.13 and 4.56, showing that ChatGPT is perceived widely as a credible and trustworthy source for operation within the academic domain. In the same spirit, from the ANOVA test, it was obtained that ChatGPT does play a significant role in enhancing academic performance since it had a significant relationship with all independent variables (X1 to X8) on the dependent variable Y.

The findings support research whereby the academic value of building computation might be highlighted. Its ability to generate human-like conversational text very much makes it a boon to students as they seek critical feedback on their thinking and research-related tasks. On the downside, this study raises various questions concerning the

unethical use of ChatGPT, whereby students use it to write an entire assignment or sit for an examination, which is tantamount to cheating. This necessitates the establishment of an ethical code and policy on the use of AI tools in education.

5.1 Contribution

Most often, research studies contribute to the ever-increasing corpus of knowledge regarding the use of AI in education through graduate and undergraduate studies and then translate such studies into applied studies as to the perspectives of particular students from defined educational contexts, as in this study through the involvement of Islamic University students in Bangladesh. The findings of the study show the potential of ChatGPT for better academic performance, critical thinking abilities, and research prowess. The study then delineated key areas where ChatGPT could be integrated into the curriculum to maximize their uses while at the same time paying attention to ethics. This research adds insights and valuable understanding for educators and policymakers of the similarities in contexts by focusing on a population that has been under-researched until now.

5.2 Limitations and Future Directions

It is this particular research contribution that, on the whole, has limitations. First, the sample is relatively small in that it consists of only 160 respondents; secondly, the population under study comprises students from just one of the universities in Bangladesh. It inhibits external validity in other contexts. Furthermore, self-reporting data used in the study is collected from students, which also introduces a bias. Increase the sample to include students from multiple educational and cultural backgrounds to generalize the findings to a larger population for future research.

Besides that, the research has primarily emphasized pointing out the positive aspects of using ChatGPT in education. Future research should also look at several negative aspects, focusing on issues such as over-reliance on AI tools, ethical issues, and implications for academic integrity caused by these tools. Longitudinal studies could attempt to investigate the impact of ChatGPT on learning outcomes and engagement with students over time. Future research would investigate the role of teachers in ethically guiding students toward using AI-based tools like ChatGPT.

5.3 Recommendations

1. Curricula should embrace the integration of ChatGPT as an ancillary technology, training students and faculty alike in best practices related to its use; thus, research assignments and exercises that involve critical thinking should be structured around its use.
2. Since potential academic dishonesty could arise from the misuse of AI tools, institutions should create and enforce ethical guidelines for their use, such as the correct use of AI in assignments or examinations.
3. Training programs must lead the faculties in guiding students toward the ethical and effective use of ChatGPT. Workshops and seminars on AI literacy and its implications in education will be included.
4. It would be very beneficial to encourage educational apps and mobile-friendly content. Teacher and student training on the effective use of mobile technology could help realize its full potential as a learning tool like chatGPT(Hossain *et al., 2025*).
5. Islamic university students should use AI tools but are not addicted to the tools. AI addiction can reduce one's own creativity.

6. Conclusion

The research findings are that ChatGPT will significantly improve the academic performance of students from the Islamic University of Kushtia in Bangladesh. Studies have demonstrated that ChatGPT has proved to be accurate, user-friendly, and a real supporter of critical thinking and research tasks. The research findings hint that ChatGPT is certainly going to change the academic engagement pattern of students by providing instant feedback and multiple points of view. However, the study suggested creating ethical guidelines to restrain the misuse of AI tools in education. Overall, ChatGPT truly depicts a massive step forward in AI-driven educational technology and can, therefore, prove to be the agent of change in higher education in Bangladesh and beyond.

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