Accountancy Business and the Public Interest
ISSN: 1745-7718

Volume: 41
Issue Number: 01

AWARENESS AND PERCEPTION OF ChatGPT AS A DISRUPTIVE EDUCATIONAL TOOL: INSIGHTS BY USING THE UTAUT FRAMEWORK

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Abstract

This study explores the awareness, perception, and efficacy of ChatGPT as a disruptive educational tool among university students and teachers, employing the Unified Theory of Acceptance and Use of Technology (UTAUT) framework. A stratified random sampling technique was used to select 150 university students and 30 academicians from diverse academic disciplines based on Patna, ensuring comprehensive demographic representation. Utilizing a qualitative research design, data were gathered through structured interviews. The findings will reveal varying levels of awareness regarding ChatGPT and significant differences in perceptions across demographic variables such as age, field of study, and teaching experience. Benefits include enhanced academic engagement, personalized learning, and efficiency in task completion has been identified. However, challenges such as overreliance on AI, potential misinformation, and privacy concerns were highlighted. These insights underscore the need for tailored implementation strategies and targeted promotional efforts to address diverse user needs and enhance adoption. Guided by the UTAUT framework, this study contributes valuable perspectives for future research and strategic decision-making, offering a roadmap for the effective integration of ChatGPT in educational settings.

Keywords: ChatGPT; Artificial Intelligence; Privacy Concern; UTAUT; Personalized Learning.

1. INTRODUCTION

AI chatbots and disruptive educational tools have sparked debates on their effects on the quickly evolving teaching and learning methods in higher education. This study explores awareness and perceptions regarding usage of Chat bot on universities students and teachers from different departments and use of other AI in higher education. Artificial intelligence (AI) significantly impacts higher education and drastically affects the academic and everyday activities of students.

Learning, innovation, and knowledge creation are frequently said to be the foundation of documentation and data-driven governance. An increasing number of AI applications are being implemented in education in developed countries and China, with the potential to significantly influence instruction and learning at all levels. Examples include AI-powered writing tools that improve students' writing quality by providing real-time feedback on issues with grammar, punctuation, and style, AI-based adaptive learning platforms that offer personalised learning experiences to students, and automated assessment.

Among current artificial intelligence advancements, chatbots - conversational machines that simulate human communication using natural language processing and machine learning algorithms - have gained interest with the launch of Open AI. Chatbots have emerged as the world's fastest growing application. The question is what makes the chatbot the most rapidly increasing AI technology. ChatGPT's specification is based on the LLM and Generative Pre-trained Transformer (GPT), which is trained on massive data sets in forms of books, article and openly accessible webpages.

ChatGPT helps students acquire knowledge, answer questions, facilitate group conversations, and solve issues instantly, improving students' learning experiences, providing personalised support, and perhaps boosting academic achievement. LLM like as Chat GPT mostly rely on internet-based training data, which produces outputs reflecting current prejudices in the data. Therefore, this research work intends to find, based on gender, academics & topic of study, students are familiar with and attitudes towards AI tools. Examples in education encompass online learning, AI, VR, AR, MOOCs, and the IOT. ChatGPT is essential for its efficient incorporation into instruction. This study seeks to evaluate the awareness, perception, and effectiveness of Chat GPT among university students and faculty members.

Important roles are played by Chat GPT's core technology and its common uses in programming, education, and healthcare. The ChatGPT algorithm, i.e based on machine DL, uses the LLM, the code pre-training model, the prompt technology to understand and create the text of the GPT model, the context-aware technology, and automatic clustering technology to enhance accuracy to the responses, and the reinforcement-learning based on human feedback (RLHF) technology to improve the original language model until the ChatGPT is operational.

(LLM): A LLM is a neural network that has been instructed to comprehend, create, translate, and summarise text. It has a huge number of parameters. It forecasts the next word in a sequence based on the meaning of the words that came prior to it. This helps it show up with answers that make sense and are important to the situation. ChatGPT utilises an extensive database comprising over 10 billion data points for pre-training.

The model comprehends probable linkages and patterns among texts during the pre-training phase, significantly enhancing its linguistic expressive capabilities and knowledge depth, thus allowing it to effectively assess and respond to everyday human language. By use of language modelling technology, ChatGPT forecasts the probability distribution of the next word across the provided previous work, therefore facilitating the understanding of the context and production of related coherent content.

ChatGPT uses unorganised text corpus and a self-monitoring training approach as well. This training approach can maximise the utilisation of many unlabelled data to get the optimisation of the model.

Prompt: In ChatGPT, the prompt is commonly an input text paragraph or phrase that serves as the beginning point for producing model outputs. Prompts can be questions, text descriptions, conversations, or any other type of text input. The model will create the appropriate output text based on the context and semantic information supplied by the prompt. Set the situational dialogue mode using the prompt, and create alternative answer options for different scenarios.

Reinforcement Learning based on Human Feedback (RLHF): ChatGPT will manually score and rank the preferences of its answers, then train a reward model (RM) with prompts and responses as input and a scaling value as output. As indications, rewards help the model learn how to output the answer to maximise the reward and fine-tune its pre-trained huge language model.

The PPO method calculates the reward function as follows: Enter the prompt into the initial and fine-tuning language models to retrieve the output text. Pass the text from the current strategy to the reward model to acquire a scalar reward, compare the two models' output text, and compute the penalty item for the difference. Final reward index optimisation optimises the language model.

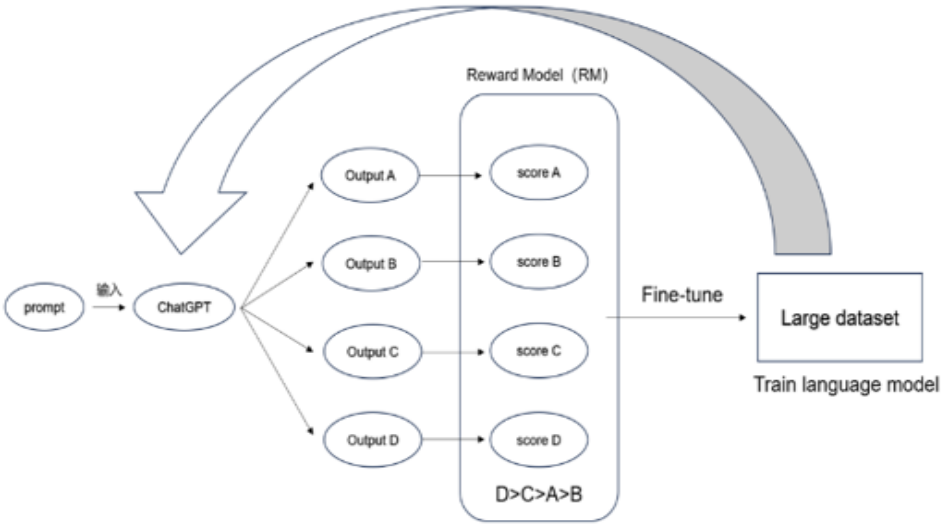


Fig 1: Flowchart of ChatGPT

Throughout history, the progressive articulation of technological possibilities over relatively long periods of time, subsequent economic crises, and exaggerated and over-optimistic expectations have been the result of the emergence of new key technologies. In fact, our comprehension of history is the foundation of all future visions. AIED has a lengthy history. In order to comprehend its course, it is beneficial to comprehend its origins. (1) Data-driven AI and (2) knowledge-based AI are two related domains of AI in Education. Data-driven AI possesses significant promise in education, contingent upon the system's objectives, however knowledge-based AI remains the foundation of the majority of current AIED systems. Immediate assistance, rapid access to information, improved educational experiences, and improved learning outcomes are among the advantages of incorporating chatbots into education. Chatbots are predominantly employed in the field of education to instruct a variety of subjects, such as mathematics, computer science, foreign languages, and engineering. Although the majority of chatbots adhere to predetermined conversational paths, a few implement personalised learning strategies that are customised to the unique requirements of each student, integrating collaborative and experiential learning principles.

Ethical concerns, evaluation methods, user perceptions, technical challenges, data integration problems, limited training datasets, and insufficient focus on usability are some of the key obstacles in chatbot development. While systematic reviews have offered useful insights into the role of chatbot technology in education, it is important to recognize that the field continues to evolve rapidly. Therefore, conducting timely and up-to-date analyses is essential for findings and assessments of students reflect the latest advancements, trends, and developments in chatbot technology

2. AIMS & OBJECTIVE

Current research mainly focuses on the immediate effects of using chatbots on learning outcomes. However, there is a need for further studies to examine the long-term impact of integrating chatbots into education. This includes evaluating whether the benefits of chatbot usage are sustainable over time and whether they continue to provide value in the long run. Additionally, it would be valuable to explore how aware university students and faculty are of chatbots and how they perceive their use, particularly across different departments and areas of specialization.

Most studies focus on the overall impact and, often overlooking potential differences influenced by student-specific characteristics. Attributes such as age, knowledge, and individual learning preferences may significantly affect how students engage with and benefit from chatbot technology. Conducting research that explores these variations could provide valuable insights, enabling the customization of chatbots to better address the unique needs of diverse student populations.

While the studies emphasise the improvements in specific learning components, additional research could investigate the precise pedagogical strategies that chatbots employ to accomplish these results. Studying the instructional approaches and mechanisms behind chatbot effectiveness could help design more targeted and impactful educational tools. This deeper understanding could guide the creation of chatbots that are better equipped to address specific learning needs and challenges. This involves studying things like how easy chatbots are to use, how useful they seem, how satisfied students and teachers are, and what their preferences are when using chatbots.

Firstly, further research into the effects of incorporating chatbots may help clarify their long-term viability and how their benefits endure. For educators and legislators to make well-informed judgements on the integration of chatbots into education systems, this information is essential. Second, by comprehending how various student attributes interact with chatbot technology, educational interventions may be customised to meet the needs of each particular student, possibly improving the learning process.

3. LITERATURE REVIEW

(Mercy Egolet & Koul Kachroo, 2024)The study concludes that awareness and perceptions of ChatGPT among Sharda University students and teachers vary significantly across different demographic variables. These insights are consistent with existing literature on technology adoption and acceptance in educational settings. The findings highlight the importance of tailored implementation strategies and targeted promotional efforts to optimize the integration of ChatGPT into teaching and learning processes. The study also emphasizes the need for addressing concerns and barriers to ensure effective and equitable use of ChatGPT in education.(Labadze et al., 2023) The integration of AI in education offers significant advantages for both students and educators. For students, AI chatbots works as valuable study assistance, flexible personalized learning, and skills development. It enhances more engagement & motivation, making learning more enjoyable and tailored to individual needs. For educators, by managing repetitive administrative duties, AI chatbots save time and free up more time for instructional preparation and student engagement. They also improve pedagogy by providing personalized support and generating tailored learning materials. Overall, AI chatbots, however, have the ability to completely transform education by increasing efficiency and boosting learning opportunities, it is important balance their benefits with the associated concerns to ensure their effective and ethical use in educational settings. Further research is needed to explore the long-term impact; however, it has the ability to completely transform education by increasing efficiency and boosting learning opportunities.

(Deng & Yu, 2023) The meta-analysis indicates that chatbot-assisted learning can significantly enhance various educational outcomes, particularly in explicit reasoning, learning achievement, knowledge retention, and learning interest. However, it does not show a significant effect on critical thinking, learning engagement, or motivation. Future research should explore additional educational components and consider larger sample sizes to further validate these findings and optimize the use of the technology in education.

(Valova et al., 2024) The increasing use of ChatGPT and similar AI technologies in education presents both opportunities and challenges. While these tools can enhance learning by providing personalized feedback and saving time, there is a significant risk of students relying on potentially inaccurate information, leading to issues of academic integrity and critical thinking development. Educators must adapt to these technologies and guide students in using them responsibly to foster effective learning outcomes.

(Stöhr et al., 2024) The study reveals that while university students generally have a positive attitude towards AI chatbots like ChatGPT, there are still substantial concerns regarding academic integrity and the future of education. Gender and field of study influence perceptions, with female students and those in humanities expressing more scepticism. These insights underscore the necessity for educational institutions to develop informed policies that address both the benefits and challenges of integrating AI technology in learning environments.

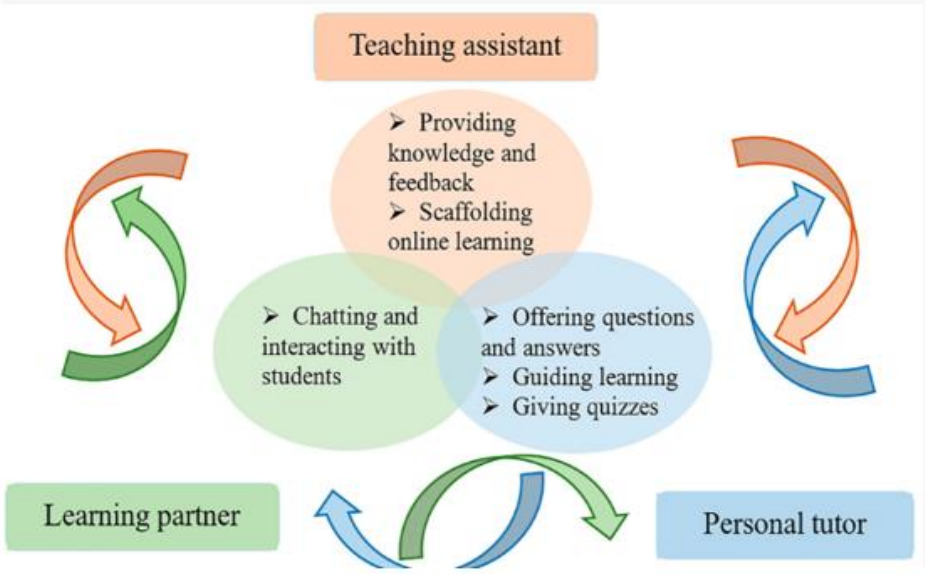
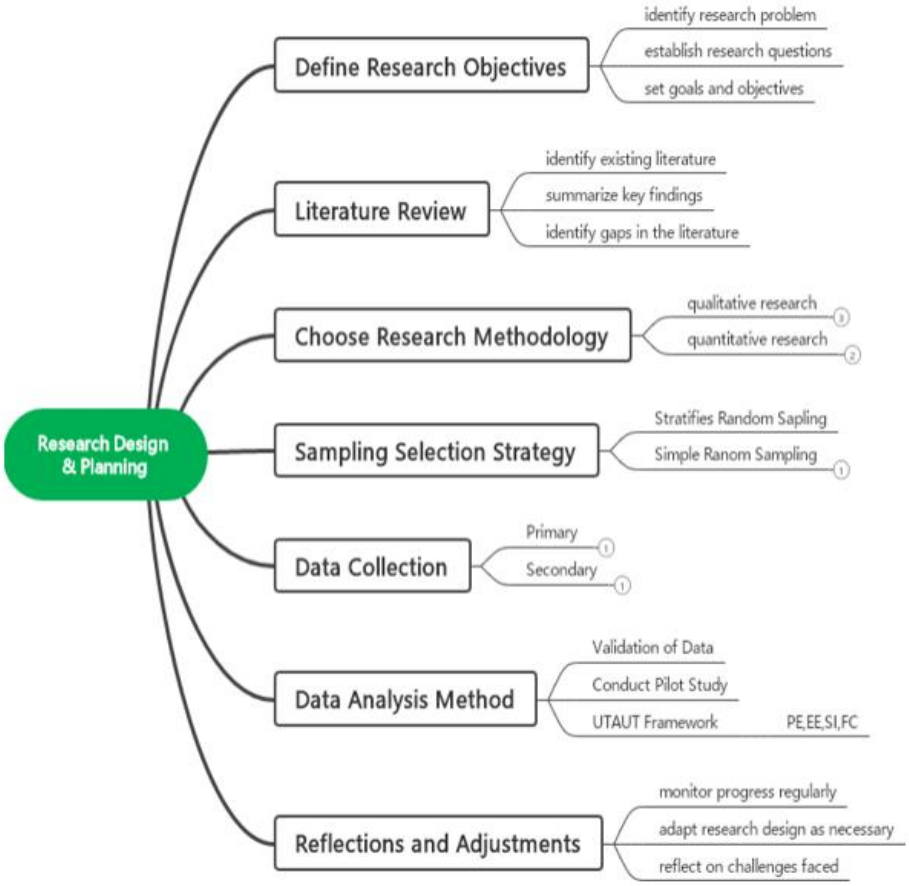


Fig 2: Roles of Chatbots in Education

It is obvious that chatbot technology significantly affects learning results in general. In particular, chatbots have shown notable improvements in information retention, explicit reasoning, and learning performance. Benefits of integrating chatbots into education include higher learning outcomes, faster access to information, instant help, and better learning experiences. Nonetheless, conflicting results have been found in relation to motivation, learning engagement, and critical thinking chatgpt are frequently employed in the field of education to instruct students in subjects such as engineering, foreign languages, computer science, and mathematics. While certain chatbots adhere to predetermined conversation patterns, others implement personalised learning strategies that are customised to the unique requirements of each student, including experiential and cooperative learning methodologies. The development of chatbots is a challenging endeavour due to a variety of factors, including the availability of limited training datasets, a lack of attention to usability, ethical concerns, assessment methods, user perceptions, technical difficulties, and data integration problems. Although previous assessments have provided valuable insights into the integration of chatbot technology into education, it is imperative to recognise that the field is perpetually evolving. Consequently, it is imperative to conduct consistent, up-to-date analyses to guarantee that the information accurately reflects the most recent advancements in chatbot technology.

4. METHODOLOGY

This study examines each stage of the research process in a thorough manner, beginning with the preliminary phases of research design and data collecting and continuing all the way through the stages of data analysis and the interpretation of findings, as shown in the illustration below.



This study followed a qualitative research design. It will utilise both qualitative and quantitative data to get an accurate understanding of ChatGPT's awareness, perception, and efficacy as a disruptive educational tool. This approach ensures that the research covers a maximum coverage in terms of perspectives, reduce biasness and to provide a clear understanding of how AI impacts education. At first the research questions are defined to align with the study's goals, focusing on understanding the awareness and perception of university students and faculty in detail. Next, we review selected articles and analyse the results using the UTAUT framework.

This framework helps assess awareness based on key factors like Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). Finally, the report and discussion section ensure clarity and easy to understand. To address the gaps identified in previous studies, we have developed four key questions for further exploration:

Q1: How well do students understand the capabilities of ChatGPT?

Q2: What benefits and challenges do students see in using ChatGPT for learning?

Q3: Are students willing to use ChatGPT in their university or school, and what outcomes do they expect to achieve from it?

Q4: How do students rate the responses they receive from ChatGPT?

These questions aim to provide deeper insights into students' awareness, perceptions, and experiences with ChatGPT in an educational setting.

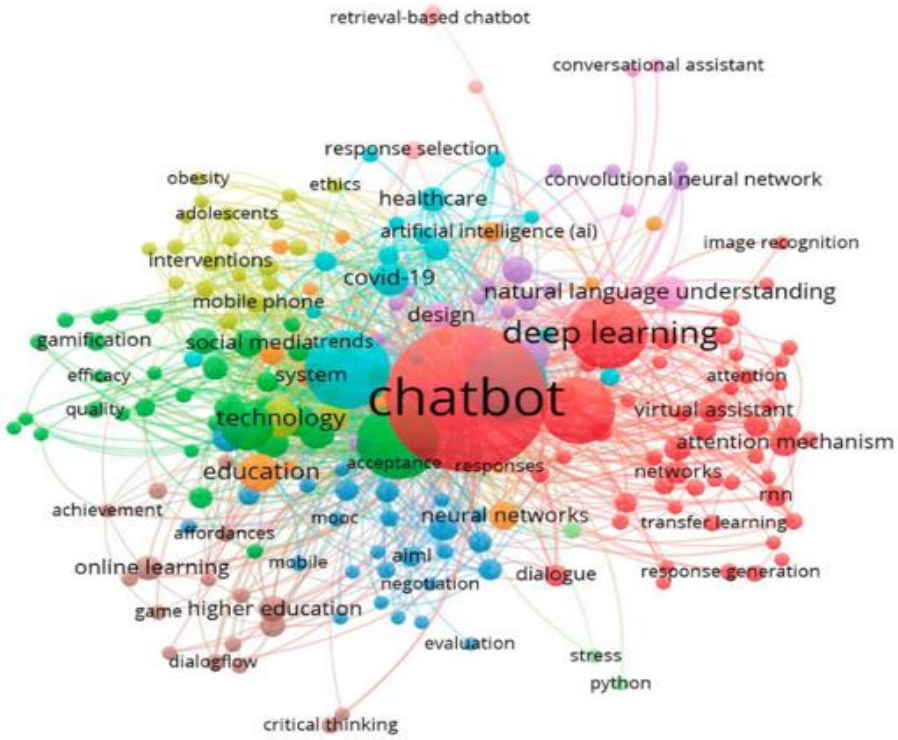


Fig 3: Keyword clustering in the context of chatbot-assisted learning

4.1 Sample Selection

A stratified random sampling method was used to ensure the sample was diverse and representative. The total population of 150, including 30 academicians, was divided into two groups: academicians and students. Random sampling was then applied within each group, giving everyone an equal chance of being selected. For faculty members, the selection considered factors like their departments, experience, area of expertise, and interview duration. For students, the selection included participants from different academic disciplines and academic years. Data was collected through both close- ended & open-ended interview questions, allowing participants to share their thoughts freely about using chatbots as a disruptive educational tool. The selected participants were invited to take part in the survey, which was conducted online using google form.

5. DATA COLLECTION

In order to collect data for this study, a mixed method was utilised, which included both quantity and quality, and semi-structured interviews were conducted. The interviews were carried out with a variety of different groups of college students and faculty members from a variety of fields. The interview procedure was developed with the intention of ensuring that respondents have a comprehensive view point and understanding of the topic. The interviews were carried out in both English and Hindi, in addition to the native languages. An in-depth examination of the subjects was made possible by the fact that each interview lasted between 30 and 90 minutes.

6. DATA ANALYSIS

Data analysis was conducted using both qualitative and quantitative methodologies. The research aims to emphasise concerns regarding the accuracy of ChatGPT in educational contexts and its potential for future application.

Table 1: List of Academician Interviewees

S. No	Departments	Experience	Area of Expertise	Interview Duration (mins)
1	Department of Biotechnology	15 years	microbiology, forensics, plant science and medicine	40
2	Department of Applied Economics & Commerce	20 years	Sustainability analysis of environmental resources, data analytics	30
3	Department of PMIR	10 years	AI in HRM, HRIS, Transactional Analysis	50
4	Department of Mathematics	22 years	Statistics, Differential Geometry Differential Equations, Graph Theory	40
5	Department of Statistic	12 years	statistical inference, reinforcement learning, statistical genetics	60
6	Department of MBA	7 years	AI and Business Analytics, Production Management, Consumer Behaviour	50
7	Department of Computer Science	11 years	Computer graphics, image processing, Industrial robotics and automation	45

The purpose of this comparative research was to shed light on the numerous possibilities and problems that are encountered by academics who specialise in different fields. The questions were separated into categories according to the information that was provided by each individual and their area of expertise. Apart from this survey includes 15 close-ended questionnaires. A close-ended questions that ask the respondent to provide their viewpoint in Y/N. Table 2 shows the proportion of professionals in universities that either agreed, disagreed.

Table 2: Descriptive Analysis from Academicians

S. No	Statement	Agree	Disagree
1	ChatGPT can improve the quality of academic work when used the right way	73.3 %	26.6 %
2	ChatGPT gives accurate and reliable answers for academic needs	60 %	40%
3	AI tools like ChatGPT will change how teaching and research are done in the future	66.6%	33.3%
4	I use ChatGPT to help with tough academic questions or reviewing literature	80%	20%
5	I suggest using ChatGPT to colleagues or students for academic tasks	73.3%	26.6%
6	ChatGPT is a great tool for creating personalized learning experiences for students	50%	50%
7	Using ChatGPT in education might reduce students' ability to think critically	66.6%	33.3%
8	Students might misuse ChatGPT for things like plagiarism or cheating	86.6%	13.3%
9	ChatGPT should be included in the curriculum to help with teaching and learning	70%	30%
10	ChatGPT brings up ethical concerns about bias in its answers	60%	40%
11	ChatGPT's accuracy and reliability make it a good tool for research	63.3%	36.6%
12	Using ChatGPT for research might affect the originality of academic work.	73.3%	26.6%
13	Professors and researchers need proper training to use ChatGPT well	66.6%	33.3%
14	ChatGPT could significantly change the future of academic research and education.	70%	30%
15	Do you think AI chatbots are useful in education?	60%	40%

Table 2 gives a descriptive summary of the views that usage and reliable on AI chatbots can have impact towards educational settings and in shaping future of students. The usage of artificial intelligence chatbots in educational settings was seen favourably by more than half of the academicians of the total.

Table 3: Demographic characteristic of participants

Characteristic	Counts	Percentage %
Gender		
Male	95	63.3
Female	55	36.6
Total	150	100
Academic Level		
Graduate	85	56.6
Post Graduate/Masters	42	28
Researcher / Ad-hoc Faculty	23	15.3
Total	150	100
Field of Study		
Social Sciences (Law, Economics, Management)	95	63.3
Humanities (History, Art, Archaeology	30	20
Natural Science	13	8.6
Others	12	8
Total	150	100

Table 4: Descriptive analysis of students' usage of different chatbots

Rate the Familiarity and Frequency of use with a selection of AI chatbots				
	Familiarity	**Rarely used**	**Never used**	**Unfamiliar**
ChatGPT	35%	28%	32%	5%
Bing AI	2%	6%	32%	60%
CoPilot	3%	3%	14%	80%
Open AI Playground	2%	5%	22%	71%
Bard AI	1%	21%	77%	1%
You Chat	-	8%	91%	1%
Chat Sonic	-	1%	10%	89%
DialoGPT	-	-	6%	94%
Socratic	-	-	8%	92%
Jasper Chat	-	-	8%	91%

The results from the prompt "Rate your familiarity and frequency of use with a selection of AI chatbots" are shown in Table 4. Respondents had four options to choose from: Unfamiliar, rarely used, never used, and Familiar.

An impressive 95% of respondents said they were familiar with ChatGPT, setting it apart from other chatbots. Additionally, over one-third of students (35%) reported using ChatGPT regularly.

In comparison, very few students said they regularly used any other chatbot. Most other chatbots were largely unknown to students, except for Bing, Bard, and OpenAI Playground, which were somewhat recognized.

The survey included seven statements that addressed the relationship between education and chatbots.

The percentage of students who either concurred, disagreed, or indicated uncertainty or a preference not to respond is depicted in Table 5 given below. The findings suggest that the majority of students (56%) have a favourable perspective on the integration of chatbots into the educational process.

Table 5: Students Perception towards AI Chatbot

Do you agree or disagree with these comments concerning AI chatbots in general				
S. No	**Statement**	**Agree**	**Don't Know**	**Disagree**
1	Cheating refers to the use of chatbots to complete assignments and exams	62%	14%	24%
2	Overall, I have a positive view of incorporating chatbots into education	56%	13%	31%
3	I am concerned about how AI chatbots might impact students' learning experiences in the future	54%	12%	34%
4	Using chatbots has made me a more effective learner	48%	27%	26%
5	The use of chatbots undermines the fundamental purpose of education.	28%	14%	58%
6	Chatbots should be banned in educational settings	23%	16%	60%

Table 6: Perception between usage of ChatGPT and attitude towards AI in education using UTAUT Framework among students

UTAUT	Statement	Agree	Disagree
PE	ChatGPT helps me perform academic tasks (e.g., assignments, research) more efficiently	75%	25%
	Using ChatGPT improves the quality of my academic work	60%	40%
	ChatGPT is useful for enhancing my learning experience	50%	50%
EE	ChatGPT is easy to use for academic purposes	60%	40%
	I can quickly learn how to use ChatGPT for my studies.	75%	25%
	The interface of ChatGPT is user-friendly for educational tasks	65%	35%
SI	My peers encourage me to use ChatGPT for academic purposes	65%	35%
	Professors or instructors support the use of ChatGPT in education	45%	55%
	Using ChatGPT is considered a norm among my classmates	50%	50%
FC	I have access to devices and resources needed to use ChatGPT effectively	45%	55%
	Technical skills required to use ChatGPT	60%	40%
	University provides adequate support for using tools like ChatGPT in education	40%	60%

Table 6 presents the analysis on perception about usage of chatbot as disruptive tools using the unified theory of acceptance and use of technology framework. In conclusion, the perceptions of performance anticipation, social impact, and enabling conditions in relation to ChatGPT are considerably different among university students dependent on the number of times they participate in the platform.

On the other hand, there are no discernible disparities in the estimates of the amount of work that is expected. In an ideal scenario, decisions about higher education policies should be guided by a clear understanding of educational practices and the perspectives of all stakeholders involved.

This approach helps ensure that policies are effective, relevant, and adaptable to the evolving needs of students, educators, and the higher education sector as a whole. This survey provides valuable insights into how students are using and perceiving AI in higher education.

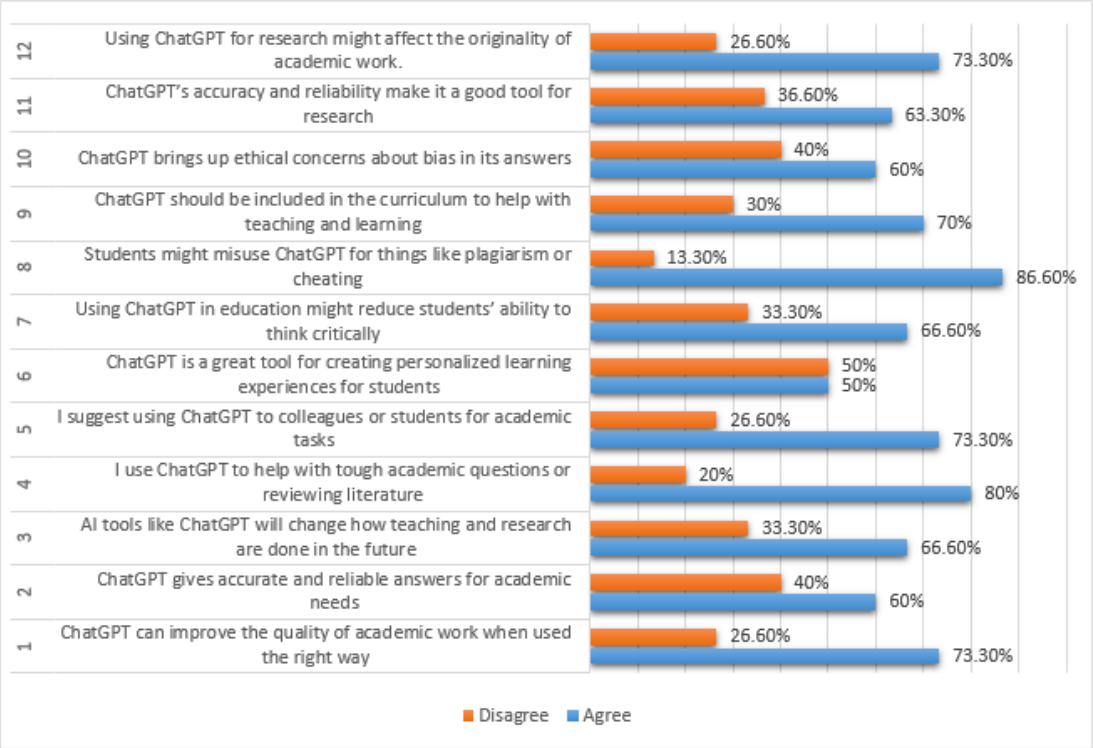


Fig 1: Graphical representation perception usage of AI

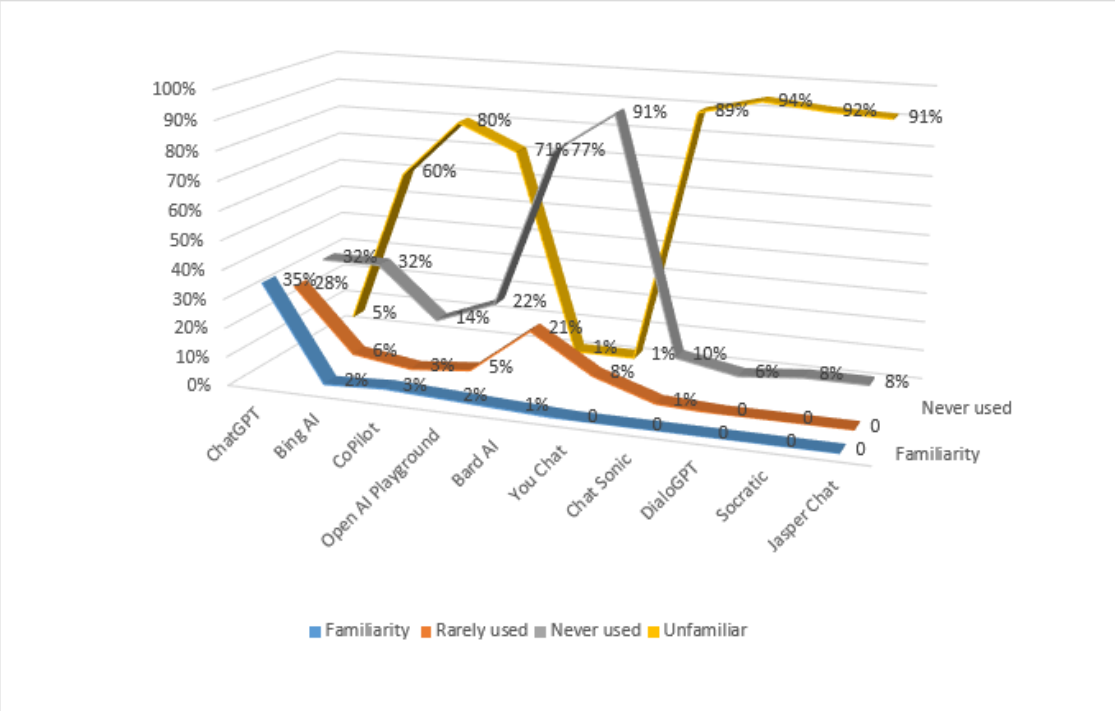


Fig 2: Different usage of AI by students

I believe that AI holds significant potential as a valuable complement to traditional educational methods, particularly in supporting individualized learning experiences. By offering personalized feedback, adaptive learning paths, and instant access to resources, AI can enhance the learning process in ways that were previously difficult to achieve. However, alongside its

promising potential, the rapid development of AI also brings a range of ethical challenges that cannot be ignored. Issues such as data privacy, algorithmic bias, accountability, and the potential over-reliance on technology raise important concerns. Unfortunately, these ethical considerations are often addressed reactively, rather than proactively, and tend to receive only limited attention.

It is crucial for educators, policymakers, and developers to engage in thoughtful discussions and establish guidelines that address these ethical issues comprehensively and in a timely manner. This will help ensure that AI is integrated into education responsibly and equitably, maximizing its benefits while minimizing potential harms. Figure 2 is a graphical representation of table 4 which shows descriptive analysis of student usage of different AI tools for their education and their impact on educations.

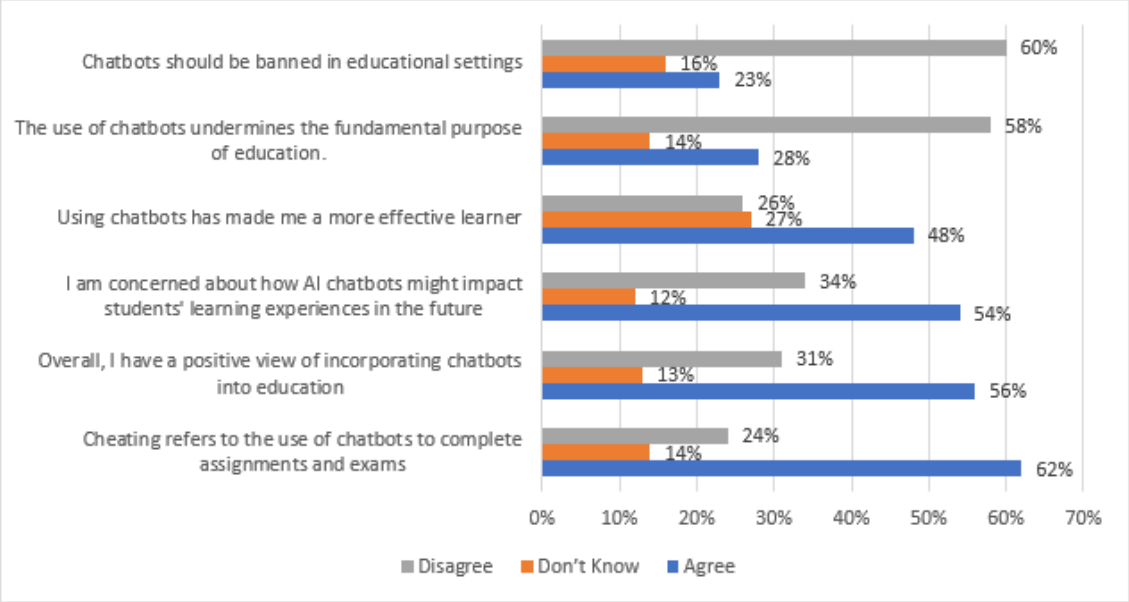


Fig 3: Students Perception towards AI Chatbot

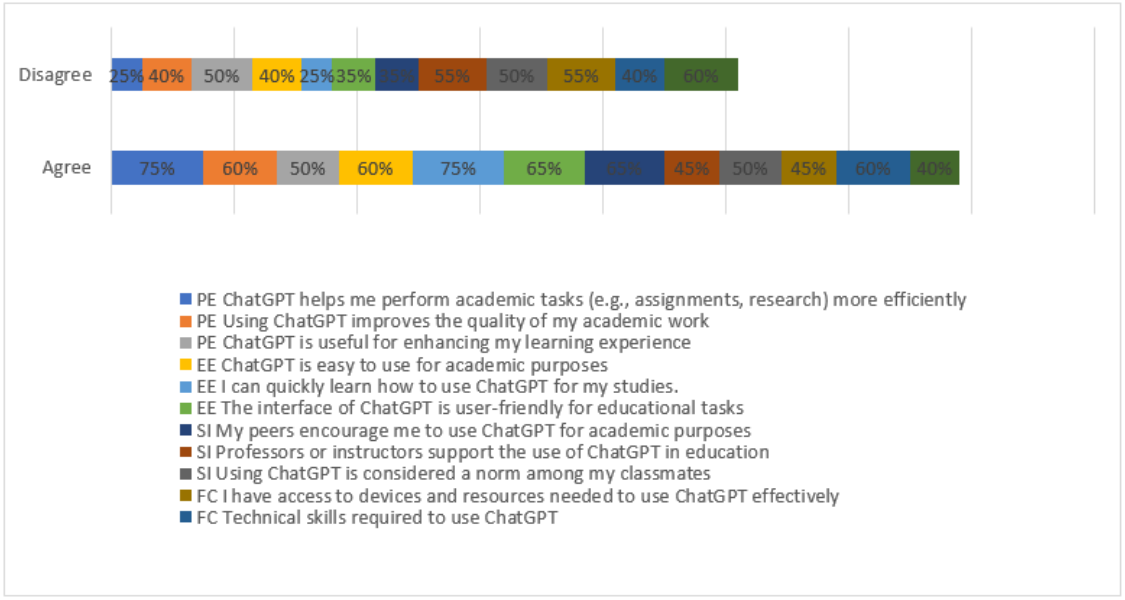


Fig 4: AI in education using UTAUT Framework among students

7. CONCLUSION AND LIMITATIONS

Almost all university students and academics participated in the survey, sharing their usage and perceptions of ChatGPT and other AI chatbots. This study emphasizes the importance of understanding students' views and experiences with AI chatbots in educational settings. The findings reveal that university students widely use ChatGPT, reflecting the growing adoption of large language models. As this trend continues, we agree with educators and researchers in AI in Education (AIED) that tools like ChatGPT have become mainstream in education and are likely here to stay. Our efforts should focus on promoting these positive advancements. To achieve this, students need thorough training and education on using AI tools effectively. ChatGPT should be viewed as a helpful tool, not a replacement for learning, and both students and educators must develop new skills to integrate AI chatbots into the educational process effectively. The current study has several limitations that must be acknowledged to provide a clear and balanced interpretation of the findings. Initially, the sample for this study was selected randomly and later stratified to ensure representation. However, the nature of the selected respondents and the design of the survey questions may have influenced participation. Specifically, students with prior exposure to chatbots in academic contexts might have been more likely to take part in the survey. This potential selection bias could lead to an overestimation of the familiarity and use of AI chatbots among the broader student population. As a result, the findings may not fully capture the perspectives of students who are less familiar with or who do not use chatbots in their educational activities. Despite these limitations, the study benefits from a robust sample size, which includes a substantial number of responses. This large dataset provides valuable insights and contributes meaningfully to our understanding of the role of AI chatbots in education, even as we remain cautious about the potential biases in the data.

Statements on ethics and open data

No personal or sensitive information was collected, ensuring full anonymity for participants. Before starting the survey, participants were provided with detailed information about the study, including their right to participate voluntarily and withdraw at any time. Participants gave their informed consent by submitting the survey, confirming their agreement to take part in the research.

Declaration of competing interest

The authors confirm that they have no financial interests or personal relationships that could have influenced the work presented in this paper.

References

1) Deng, X., & Yu, Z. (2023). A Meta-Analysis and Systematic Review of the Effect of Chatbot Technology Use in Sustainable Education. In *Sustainability (Switzerland)* (Vol. 15, Issue 4). MDPI. https://doi.org/10.3390/su15042940

2) Labadze, L., Grigolia, M., & Machaidze, L. (2023). Role of AI chatbots in education: systematic literature review. In *International Journal of Educational Technology in Higher Education* (Vol. 20, Issue 1). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1186/s41239-023-00426-1

3) Mercy Egolet, W., & Koul Kachroo, A. (2024). Awareness, Perception and Efficacy of ChatGPT as a Disruptive Educational Tool: A Study of Sharda University Students and Teachers. *International Journal of Innovative Science and Research Technology (IJISRT)*, 427–437. https://doi.org/10.38124/ijisrt/ijisrt24aug455

4) Stöhr, C., Ou, A. W., & Malmström, H. (2024). Perceptions and usage of AI chatbots among students in higher education across genders, academic levels and fields of study. *Computers and Education: Artificial Intelligence*, *7*. https://doi.org/10.1016/j.caeai.2024.100259

5) Valova, I., Mladenova, T., & Kanev, G. (2024). Students' Perception of ChatGPT Usage in Education. In *IJACSA) International Journal of Advanced Computer Science and Applications* (Vol. 15, Issue 1). www.ijacsa.thesai.org

6) Lee, Z. W. (2024). *Intention to adopt ChatGPT in higher education* (Doctoral dissertation, UTAR).

7) Tiwari, C. K., Bhat, M. A., Khan, S. T., Subramaniam, R., & Khan, M. A. I. (2024). What drives students toward ChatGPT? An investigation of the factors influencing adoption and usage of ChatGPT. *Interactive Technology and Smart Education*, *21*(3), 333-355.

8) Menon, D., & Shilpa, K. (2023). "Chatting with ChatGPT": Analyzing the factors influencing users' intention to Use the Open AI's ChatGPT using the UTAUT model. *Heliyon*, *9*(11).

9) Jain, A., Shah, M. A., & Jiwani, C. K. (2024). A Study on Evaluating the Antecedents of the Adoption of Chatgpt. *Educational Administration: Theory and Practice*, *30*(6), 2243-2262.

10) Romero-Rodríguez, J. M., Ramírez-Montoya, M. S., Buenestado-Fernández, M., & Lara-Lara, F. (2023). Use of ChatGPT at university as a tool for complex thinking: Students' perceived usefulness. *Journal of New Approaches in Educational Research*, *12*(2), 323-339.

11) Thomas, R., Ajith, K. A., & Shivdas, A. (2024, May). Revolutionizing Education in Emerging Markets: Understanding ChatGPT Adoption through a Comprehensive Lens of UTAUAT, Flow Theory, and Critical Mass Theory. In *2024 IEEE Recent Advances in Intelligent Computational Systems (RAICS)* (pp. 1-6). IEEE.

12) Amin, M. A., Kim, Y. S., & Noh, M. (2024). Unveiling the drivers of ChatGPT utilization in higher education sectors: the direct role of perceived knowledge and the mediating role of trust in ChatGPT. *Education and Information Technologies*, 1-27.

13) Bhaskar, P., & Rana, S. (2024). The ChatGPT dilemma: unravelling teachers' perspectives on inhibiting and motivating factors for adoption of ChatGPT. *Journal of Information, Communication and Ethics in Society*.

14) Jo, H., & Bang, Y. (2023). Analyzing ChatGPT adoption drivers with the TOEK framework. *Scientific reports*, *13*(1), 22606.

15) Au, W. C. (2023). *Examining the adoption of chatgpt technology among academics in higher education institutions in malaysia* (Doctoral dissertation, UTAR).

16) Rana, M. M., Siddiqee, M. S., Sakib, M. N., & Ahamed, M. R. (2024). Assessing AI adoption in developing country academia: A trust and privacy-augmented UTAUT framework. *Heliyon*, *10*(18).

17) Saif, N., Khan, S. U., Shaheen, I., ALotaibi, F. A., Alnfiai, M. M., & Arif, M. (2024). Chat-GPT; validating Technology Acceptance Model (TAM) in education sector via ubiquitous learning mechanism. *Computers in Human Behavior*, *154*, 108097.

18) Strzelecki, A., Cicha, K., Rizun, M., & Rutecka, P. (2024). Acceptance and use of ChatGPT in the academic community. *Education and Information Technologies*, 1-26.

19) Bouteraa, M., Bin-Nashwan, S. A., Al-Daihani, M., Dirie, K. A., Benlahcene, A., Sadallah, M., ... & Chekima, B. (2024). Understanding the diffusion of AI-generative (ChatGPT) in higher education: Does students' integrity matter? *Computers in Human Behavior Reports*, *14*, 100402.

20) Foroughi, B., Senali, M. G., Iranmanesh, M., Khanfar, A., Ghobakhloo, M., Annamalai, N., & Naghmeh-Abbaspour, B. (2024). Determinants of intention to use ChatGPT for educational purposes: Findings from PLS-SEM and fsQCA. *International Journal of Human–Computer Interaction*, *40*(17), 4501-4520.

21) Al-Mughairi, H., & Bhaskar, P. (2024). Exploring the factors affecting the adoption AI techniques in higher education: insights from teachers' perspectives on ChatGPT. *Journal of Research in Innovative Teaching & Learning*.

22) Lee, S., Jones-Jang, S. M., Chung, M., Kim, N., & Choi, J. (2024). Who is using ChatGPT and why? Extending the Unified Theory of Acceptance and Use of Technology (UTAUT) model. *Information Research an international electronic journal*, *29*(1), 54-72.

23) Patterson, A., Frydenberg, M., & Basma, L. (2024). Examining generative artificial intelligence adoption in academia: a UTAUT perspective. *Issues in Information Systems*, *25*(3).

24) Biyiri, E. W., Dahanayake, S. N. S., Dassanayake, D. M. C., Nayyar, A., Dayangana, K. T. L. U. S., & Jayasinghe, J. A. P. M. (2024). ChatGPT in self-directed learning: Exploring acceptance and utilization among undergraduates of state universities in Sri Lanka. *Education and Information Technologies*, 1-29.

25) Polyportis, A., & Pahos, N. (2024). Understanding students' adoption of the ChatGPT chatbot in higher education: the role of anthropomorphism, trust, design novelty and institutional policy. *Behaviour & Information Technology*, 1-22.

26) Long, C., Wu, J., Ye, J., & Wang, W. (2025). Investigating the Factors Influencing ChatGPT Adoption Intention among Chinese Higher Education Personnel: An Empirical Study Based on the Extended UTAUT2 Model.

27) Salifu, I., Arthur, F., Arkorful, V., Abam Nortey, S., & Solomon Osei-Yaw, R. (2024). Economics students' behavioural intention and usage of ChatGPT in higher education: A hybrid structural equation modelling-artificial neural network approach. *Cogent Social Sciences*, *10*(1), 2300177.

28) Ma, X., & Huo, Y. (2023). Are users willing to embrace ChatGPT? Exploring the factors on the acceptance of chatbots from the perspective of AIDUA framework. *Technology in Society*, *75*, 102362.

29) Fourie, K. L. (2024). *Acceptance and Use of Large Language Models as Design Tools for Learning Design Professionals* (Master's thesis, University of Johannesburg (South Africa)).

30) Kalmus, J. E., & Nikiforova, A. (2024). To accept or not to accept? An IRT-TOE Framework to Understand Educators' Resistance to Generative AI in Higher Education. *arXiv preprint arXiv:2407.20130*.