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ChatGPT as an AI-enabled Academic Assistant: Attitude and Usage among Fisheries Students

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HIGHLIGHTS

- ChatGPT excels in text-based tasks compared to Google BARD and Microsoft Bing.
- High familiarity and usage of ChatGPT among fisheries students, with no significant demographic influences.
- Cognitive behavior, perceived usefulness, and attitude influence positive attitudes; perceived risk affects negative attitudes.
- Gender-based differences noted; no significant association between education levels and ChatGPT usage.
- Insights aid tailored interventions for AI adoption across academic domains.

ARTICLE INFO

Keywords: ChatGPT, AI-enabled assistant, Attitude, Technology acceptance model, Fisheries students.

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ABSTRACT

Educational landscape stands to undergo a profound transformation with the advent of ChatGPT, an AI-driven academic assistant which empowers students to access information, create content, and enhanced learning experiences. Compared to Google BARD and Bing Chat, ChatGPT emerges as superior choice for text-based content and language-related tasks, offering the potential to streamline academic endeavors and deliver personalized learning experiences. ChatGPT stands out for its versatility in academic settings. The study focused on how fisheries students perceive and utilize ChatGPT within their specialized field, employing a validated Technology Acceptance Model framework. Among 84 participants, mostly post-graduate students averaging 24.5 years of age, findings revealed that 75 per cent had prior knowledge of ChatGPT, and 70 per cent reported using it. Notably, 38 per cent expressed highly favorable attitudes toward its usage. An independent t-test revealed gender differences in ChatGPT usage among fisheries students. Principal Component Analysis highlighted factors influencing ChatGPT adoption, such as innovativeness, perceived risk, anxiety, and academic integrity concerns among non-users, while users were driven by cognitive behavior factors, perceived usefulness, attitude, peer influence, innovativeness, and ease of use. The findings deepen our understanding of AI assistants' acceptance and usage in academia, setting the stage for further research in this evolving field.

INTRODUCTION

According to the National Education Policy 2020, higher education institutions must use digital tools and immersive technology to improve education while considering the risks. With the potential to transform traditional teaching and learning processes, artificial intelligence (AI) introduces new tools to the academic environment (Adiguzel et al., 2023). Artificial intelligence focuses on developing computers that can perform tasks beyond human ability (Khanganbi & Priya, 2024). These tools play a crucial

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role in accessing information in this era of the information age (Chayal et al., 2023). In November 2022, ChatGPT, an advanced AI model by OpenAI, made waves in the tech world. As part of OpenAI's Large Language Models (LLMs), it's a chatbot-like interface and remains a hot topic in tech circles (Williamson et al., 2023). As technology progresses, ChatGPT has attracted attention for its potential to transform how we access and engage with information. Despite its promise, ChatGPT encounters challenges like access restrictions and server loads, leading to the investigation of alternative AI models such as Sphere, Bloom, and PaLM (Devansh, 2022). ChatGPT stands out due to its immense size, accessing vast data and billions of parameters, allowing exceptional precision in language tasks. Despite limited training data, its adaptability enables fine-tuning for tasks like translation and summarization. Its capability to mimic human speech sets it apart from other language models (Conroy, 2023; Liu et al., 2022; Elkins & Chun, 2020).

The nourishment of the students determines the nation's development as they are the most important segment of the total population (Meinam et al., 2023). It's vital to provide students with diverse AI tools to boost productivity. This study examines ChatGPT's effectiveness compared to other popular AI tools like Google BARD and Microsoft Being in academic contexts. Natural language processing (NLP), involving the analysis and interpretation of human language to extract valuable information, marks a notable advancement, attributed to ChatGPT (Lund & Wang, 2023). ChatGPT could transform personalized learning, enhance communication skills, and boost student engagement as an AI-based academic assistant (Adiguzel et al., 2023). Yet, its acceptance and utilization in academia depends on several factors, such as perceived usefulness, ease of use, perceived risks, attitudes, social influence, and cognitive-behavioral factors, all evaluable through the Technology Acceptance Model (TAM) (Davis, 1989; Marikyan & Papagiannidis, 2023). Comprehending the factors affecting the adoption of AI tools like ChatGPT among students in agriculture and allied sciences, including Fisheries, is vital for educators and policymakers. This study has two main goals: Firstly, to assess ChatGPT's usability compared to other alternatives. Secondly, to identify the factors influencing Fisheries students' attitudes and usage of ChatGPT. By meeting these objectives, the study illuminates the potential advantages and obstacles of integrating ChatGPT into academic environments. It adds to the ongoing discourse on the role of AI-driven academic aides in contemporary education. It involves closely examining ChatGPT's efficacy relative to other choices and comprehending students' preferences for its usage, all with the aim of enhancing education. Artificial intelligence refers to computers performing tasks beyond human capability, including enhancing planning, problem-solving, and theorem proving.

METHODOLOGY

The research methodology for evaluating ChatGPT's usability and acceptance among Fisheries students and research scholars employed a mixed-method approach. It consisted of two pivotal components; the first component involved a meticulous comparative analysis of ChatGPT alongside two widely-used alternatives, BARD and Microsoft Bing, with a specific focus on data sources, language models, content quality, cost considerations, and usage limitations. Real-time prompts were used to assess tool performance, and online sources were consulted to gather specific details on data sources, privacy, language models, and other relevant aspects. The primary objective was to discern the most efficient tool for academic settings. The worldwide popularity of ChatGPT in Google search trends further emphasized its significance in conducting ChatGPT's usability and acceptance among Fisheries students. We conducted a survey to gather quantitative data by adopting a previously validated survey instrument termed the Technology Acceptance Model Edited to Assess ChatGPT Adoption (TAME-ChatGPT) by Sallam et al., (2020), which was customized to align with the TAM framework. The survey encompassed statements related to various constructs, including perceived usefulness, perceived ease of use, perceived risks, attitude toward the technology, social influence, and cognitive behavioral experience factors. A total of 84 responses were obtained, including students from a diverse range of educational institutions, encompassing State Agricultural and Fisheries Universities, Central Agricultural Universities, and the Central Institute of Fisheries Education. Respondents represented a spectrum of educational levels, ranging from undergraduate (UG) students pursuing a Bachelor of Fishery Science, postgraduate (PG) students enrolled in Master of Fishery Science programs, to Ph.D. scholars in Fisheries Sciences. This diverse sampling strategy allowed for a broad exploration of attitudes and usage patterns. The survey items were framed using a 5-point Likert scale that ranged from "strongly agree" (five) to "strongly disagree" (one)., ensuring a nuanced understanding of participant perspectives. Reverse scoring was applied to each item indicating negative attitudes towards ChatGPT. The collected data underwent a series of analyses. Descriptive statistics were performed for demographic variables. The classification of demographic variables concerning ChatGPT usage was assessed using the Chi-square test since all the variables were nominal. Independent t-tests and One-way ANOVA examined significant associations between variables. Principal Component Analysis (PCA) identified influential variables of ChatGPT usage, and Cronbach's alpha reduced variables when exceeding 25. Analysis was performed using Microsoft Office 365 and Statistical Package for Social Sciences (SPSS) Version 23.

RESULTS

The first component is a thorough comparison of three well-known chatbot platforms: ChatGPT (2023), Google Bard (2022); & Microsoft Bing (2023). Each of these platforms has its own set of characteristics and capabilities, making the core topic of "Which Is Better?" a complicated one. The assessment of numerous crucial factors has yielded useful insights into their distinct strengths and weaknesses.

Comparison of AI chatbot platforms

The comparison between leading AI platforms, including ChatGPT, Google BARD, and Microsoft Bing, identifies key distinctions in data sources, language models, content creation capabilities, pricing structures, usage limitations with some positives and academic usability.

Table 1. Comparison of AI Chatbot platforms

Factors	ChatGPT (2023)	Google Bard (2022)	Microsoft Bing (2023)
Data Source	Training data is from the Internet	Real-time content from the internet	Can generate both creative content and images with the help of DALL-E Predefined tools.
Language Model	Generative Pre-trained Transformer (GPT), GPT3, GPT 3.5, GPT-4	Pathways Language Model (PaLM), PaLM2, LaMDA	Integrated with GPT-4
Content Creation	Delivers content in a single promptEffective Prompts give efficient results	Generates additional pieces of information along with results.	Delivers with referencesProvides optional suggestions.
Pricing	ChatGPT is free for all users. ChatGPT Plus, users need to pay Rs 1663/month.	Free of cost.	Free of cost
Usage Limitations	Data up to September 2021No limitation on prompts	200 questions per hour	30 chats per session and 300 chats per day. No access to external tools or databases
Positives	Better at processing texts and can be useful for data summarization or other related tasks (GPT4 can also read Image text and Video)	Better at generating human-like responses to users with the latest information	Research tool to help you with image generation and in-depth page insights
Academic Usability	Works well with text-based content and language-related tasks	Suited for research that involves web pages and images	Proficient in generating human-like responses and providing current information

Usage of Chat GPT among the students

Among the 84 participants, it is notable that 75 per cent were already familiar with ChatGPT prior to the study, within this group, a significant 70 per cent acknowledged having used ChatGPT previously. The Chi-square test analysis demonstrated that factors such as age, gender, university affiliation, educational level, and Ph.D. status do not significantly ($p > 0.05$) affect ChatGPT utilization among these students.

Attitude of users towards ChatGpt

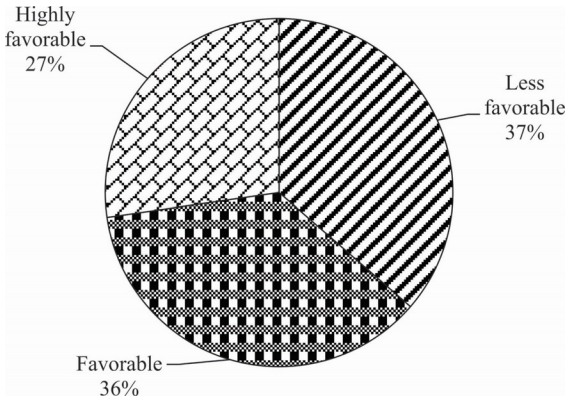
Among the users 37 per cent exhibited a less favourable attitude, 36 per cent held a favourable attitude, and 27 per cent displayed a highly favourable attitude (Figure 1). Additionally, an independent t-test highlighted a significant ($p > 0.10$) difference in the mean scores of males (0.511) and female (0.371) students. There was no significant gender-based difference in attitudes.

Attitude of students towards ChatGPT usage and level of Education

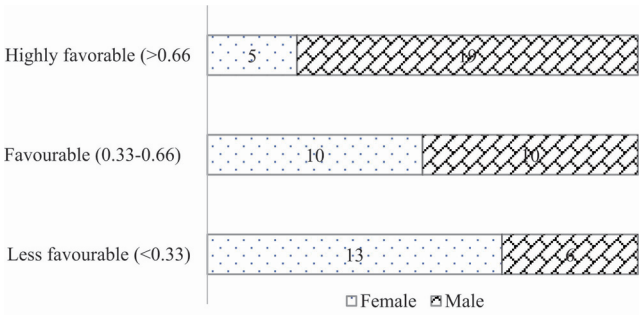
Students' attitudes towards ChatGPT usage in relation to their educational level (Graduation, PG, Ph.D. in Figure 2) through a One-way ANOVA indicated that there was no significant association ($p > 0.05$) between the level of education and the usage of ChatGPT among the study participants.

Factors Explaining Attitude towards Using ChatGPT

The study shows that Cognitive Behaviour factors (CB), perceived usefulness (PU), attitude (AT), peer influence (PI), Innovativeness (IN), and ease of use (EU) are the key factors influencing attitudes toward ChatGPT. The relative contribution of different key factors on attitude towards the use of Chat GPT is given in Table 3. The percentage of variance observed for the factors were very high with a value of 77.5 per cent.



Attitude of users toward ChatGPT (n=44)



Attitude of students about ChatGPT (n=63)

Figure 1. Attitude towards usage of ChatGPT

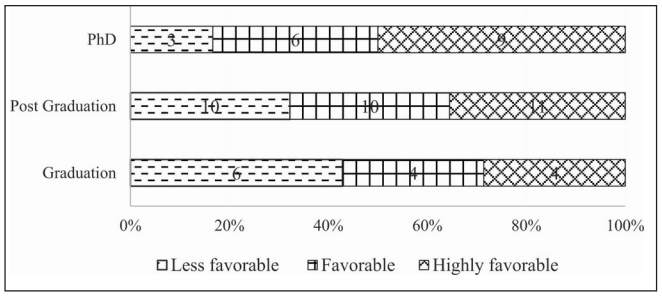


Figure 2. Attitude of students towards ChatGPT usage and level of Education

Factors explaining attitudes towards not using ChatGPT

Within the present study among Fisheries Science students, the major factors explaining negative attitudes towards ChatGPT usage are *technological/innovativeness, perceived risk, anxiety, and concerns related to academic integrity*, collectively explaining a significant -76.826 per cent of the variance in the data (Table 3).

DISCUSSION

Each platform has its own strengths and compatibility: ChatGPT is great for creative content, Google BARD fits well with Google products, and Microsoft Bing works seamlessly with Microsoft's ecosystem (Stalbaumer, 2023). Each has its pros and cons, but ChatGPT stands out for text-based tasks, while Bing Chat and BARD excel in web research and real-time information, respectively. Most participants were university students and young researchers, ensuring findings are relevant. Gender representation is balanced, reducing biases. Respondents from both State Agricultural Universities and Central Universities provide diverse data, improving research comprehensiveness. The range of educational levels in the sample reflects diverse experiences and perspectives. This enables examination of how individuals at different academic stages view and use AI academic assistants. Acknowledging that Fisheries education backgrounds may affect AI tool adoption and usage, this enhances the study's depth. It allows exploration of perceptions and utilization of AI-enabled academic assistants, such as ChatGPT, across various Fisheries education settings.

Examining ChatGPT usage among fisheries students revealed valuable insights into its acceptance and use. With 75 per cent of students already familiar with the AI Chatbot and 70 per cent having used it, it indicates a proactive integration of AI academic assistants in their studies. This highlights ChatGPT's potential impact on the educational journey of fisheries students. The Chi-square test indicated that age, gender, university affiliation, educational level,

Table 2. Factors Explaining Attitudes towards Using ChatGPT (n=44)

Components	1 (CB)	2 (PU)	3 (ATT)	4 (PI)	5 (IN)	6 (EU)
Technology like ChatGPT plays a pivotal role in fostering academic achievement	0.089	0.049	0.804	0.039	0.376	0.014
I find that technology such as ChatGPT is appealing and enjoyable to utilize.	-0.031	-0.142	0.329	0.272	0.672	0.137
I'm consistently eager to explore new technologies such as ChatGPT.	0.112	0.218	0.184	-0.02	0.87	-0.043
I rely on my colleagues and friends for their views on using ChatGPT.	0.103	0.187	0.484	0.33	0.28	-0.465
ChatGPT assists me in saving time when browsing for information	0.651	-0.176	-0.14	0.23	0.283	0.423
For me, ChatGPT is a convenient method for accessing information	0.315	0.786	0.018	-0.14	0.285	0.022
For me, ChatGPT is a source of reliable and accurate information	0.118	0.837	0.08	0.21	-0.01	-0.16
ChatGPT helps me in better understanding of difficult topics and concepts	0.158	0.136	-0.108	0.828	0.292	0.062
ChatGPT makes it easier for me to complete the assignments in university courses	0.211	0.542	0.034	0.401	0.09	0.437
I recommend my colleagues to use ChatGPT for facilitating their academic duties	0.215	0.244	0.48	0.659	0.096	-0.04
When compared to other sources of information that I have already used, ChatGPT is more useful	0.015	0.647	0.085	0.155	-0.07	0.41
I think that using ChatGPT has helped to improve my overall academic performance	0.242	0.769	0.38	0.043	0.081	0.157
I naturally turn to ChatGPT whenever I require any information to complete my university assignments and responsibilities.	0.665	0.404	0.283	0.186	0.106	-0.09
Frequently, I rely on ChatGPT as a resource for facts and information required for assignments and obligations of university.	0.768	0.206	0.377	0.178	-0.01	-0.11
I appreciate the convenience and efficiency that ChatGPT provides for my duties and assignments of university	0.785	0.3	-0.002	0.05	0.358	0.002
I acknowledge the precision and dependability of the information provided by ChatGPT	0.617	0.4	-0.062	0.179	-0.23	0.241
I believe that by using ChatGPT we can save our time & effort required for my university assignments and duties	0.452	0.159	0.154	0.081	-0.05	0.725
ChatGPT is easy to use	-0.05	0.155	-0.078	0.212	0.43	0.587
The positive experiences of others have encouraged me to use ChatGPT	0.087	0.017	0.361	0.778	-0.13	0.246
I believe that people I know have improved their academic performance as a result of using ChatGPT	0.706	0.034	0.298	-0.02	-0.13	0.247
I think using ChatGPT is important for me to keep up with my peers academically	0.322	0.25	0.735	0.197	0.044	0.049
Initial Eigen Values	7.252	2.394	1.96	1.713	1.578	1.016
Percentage of variance	34.532	11.398	9.332	8.155	7.516	4.836
Cumulative %	75.77					

Cognitive Behaviour (CB), Perceived usefulness (PU), Attitude (ATT), Peer Influence (PI), Ease of Use (EU)

Table 3. Factors explaining attitudes towards not using ChatGPT (n=19)

Components	1(TI)	2(PR)	3(ANX)	4(AIN)
I'm worried about whether the information from ChatGPT can be trusted.	0.096	0.91	-0.166	0.024
I worry that utilizing ChatGPT might lead to accusations of plagiarism against me.	0.24	0.177	-0.005	0.835
I'm afraid that depending too much on ChatGPT might hinder my ability to develop critical thinking skills.	0.18	0.452	0.452	-0.677
I am concerned about possible security risks of using ChatGPT	0.01	0.716	0.334	0.266
I am afraid of being too dependent on technology like ChatGPT	0.136	-0.01	0.828	0.126
I am afraid that using ChatGPT will lead to lack of novelty in my university assignments and duties	0.2	-0.005	0.751	-0.094
I am afraid that the use of the ChatGPT would ruin academic and university policies	0.173	0.314	0.347	0.725
I am worried about the possible privacy risks that might be accompanying ChatGPT	-0.102	0.484	0.639	0.107
I am eager about using ChatGPT for learning and research	0.879	0.239	0.35	0.081
I believe technology such as ChatGPT is an significant tool for success in the academic field	0.786	0.09	0.366	0.375
I think that technology like ChatGPT is attractive and fun to use	0.693	0.542	-0.027	0.029
I am always eager to learn about new technologies like ChatGPT	0.535	0.582	0.239	0.132
I trust the views of my friends or colleagues about using ChatGPT	0.778	-0.14	-0.072	0.04
Initial Eigen Values	4.951	1.89	1.63	1.517
Percentage of variance	38.08	14.51	12.536	11.667
Cumulative %	76.826			

Technological innovativeness (TI), Perceived risk (PR), Anxiety (ANX), Academic Integrity (AIN)

and Ph.D. status have no significant impact on ChatGPT usage. This underscores the wide relevance of AI academic assistants in this educational setting. This supports the findings' credibility, aligning with a similar study by Sallam et al., (2023).

Differing attitudes toward ChatGPT indicate diverse user perspectives and experiences. While t-test results hinted at a potential gender influence on attitudes, but no significant gender-based differences emerged which was contrary to Sallam et al.'s findings. These contradictory results underscore the intricate nature of factors shaping attitudes toward AI academic assistants, emphasizing the necessity for additional research in this field. Education level doesn't significantly affect ChatGPT adoption and usage among students. This reinforces the wide applicability of AI academic assistants in various educational environments, regardless of participants' educational backgrounds. Consistency with Sallam et al., (2023) findings further highlights the generalizability of these conclusions across diverse educational settings. Factor analysis offers valuable insights into factors influencing attitudes toward ChatGPT (Sallam et al., 2023; Abdaljaleel et al., 2023). It shows that both consistencies and variations in these factors significantly influence users' attitudes.

The six key factors help in understanding how users perceive and interact with AI academic assistants (Table 3). Conversely, Abdalaleel et al., (2023), in their study, reported a different set of factors, with innovativeness, perceived use, perceived risk, and perceived ease of use as the major factors. These differences in factors indicate that various aspects might influence users' attitudes. This study highlights the significance of innovation and perceived risk in shaping users' attitudes toward ChatGPT. Users' openness to new technologies and their perception of risks are key factors. The high variance percentage, akin to Sallam et al., 2023 findings (72.6%), suggests that these factors explain a substantial portion of attitude variation.

These findings indicate that various factors influence attitudes toward ChatGPT across different academic disciplines, with varying degrees of impact. In Fisheries Science, factors like technological innovation, perceived risk, anxiety, and academic integrity hinder acceptance. Sallam et al., (2023) study in healthcare universities revealed that perceived risks, attitudes toward technology/social influence, and anxiety explained 69.3 per cent of attitude variance, emphasizing the importance of perceived risks and emotional factors in shaping negative attitudes. Abdaljaleel et al., (2023) study among general university students highlighted perceived risk as a significant factor explaining negative attitudes toward ChatGPT.

The comparative analysis reveals both commonalities and variations in the factors influencing attitudes across different academic domains. While perceived usefulness and cognitive/behavioral factors consistently play a central role in fostering positive attitudes, the specific factors vary. Technological ease and a positive stance towards technology are vital in the general university setting, while concerns regarding risks and anxiety feature prominently among healthcare students. Furthermore, the factors contributing to negative attitudes are diverse, with perceived risk consistently emerging as a crucial factor. The specificity of these factors emphasizes the need for tailored interventions to promote the adoption of AI academic assistants in different academic disciplines. Understanding the unique challenges and motivations within each domain is essential for developing effective strategies to enhance AI technology acceptance.

CONCLUSION

ChatGPT shows promising experiences in enhancing language-related tasks, challenges remain in content creation. Pricing considerations and understanding platform limitations are crucial for informed decisions in academia. Research on Fisheries students and scholars' attitudes towards ChatGPT reveals high awareness and engagement within academic community. The lack of significant associations between demographics and ChatGPT usage suggests its broad applicability. Diverse user attitudes underscore the need for nuanced understanding of AI assistant interactions. Gender-based differences and education-level associations emphasize the complexity of AI adoption factors. Comparative analysis across academic domains shows consistencies and variations in factors influencing attitudes towards ChatGPT usage. While Cognitive

behaviour aspects consistently influence positive attitudes, other factors vary. These insights guide effective integration of AI tools to enhance educational experiences in academia.

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