"Examining the role of personality traits and factors for ChatGPT adoption Among university students"

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ABSTRACT: Universities students' adoption of ChatGPT is significantly influenced by their personality traits and other aspects. Higher degrees of personality traits are displayed by female users and younger people, which may have an impact on how they engage with the system 1. In ChatGPT, a human-like demeanour can boost utilitarian value and satisfaction, resulting in favorable word-of-mouth and system adoption. ChatGPT's human-like personality cap features greatly increase utilitarian value and happiness, and its non-language barrier, memorability, and system upgrades facilitate the application and acquisition of knowledge. A number of elements, including perceived effort expectancy, autonomous motivation, learners' AI proficiency, educators' competency, inventive behaviour toward technological agility, and perceived student engagement, influence educators' intention to implement ChatGPT. The perceived efficacy of ChatGPT can predict its acceptability.

INTRODUCTION

ChatGPT, an advanced AI model developed by OpenAI, has captured global attention for its remarkable capacity to navigate complex language tasks, particularly in conversational settings. This AI-generated content (AIGC) model is poised to revolutionize numerous sectors, including healthcare, education, law, and scientific research. Its capabilities range from providing proficient answers to generating well-referenced writing and supporting clinical decision-making. Despite its rapid evolution, the GPT natural language model still grapples with issues. However, the introduction of GPT-3 and its subsequent evolution into ChatGPT marked a turning point in natural language processing. ChatGPT's ability to produce human-like writing with context and coherence has completely changed the landscape of language processing, opening up new possibilities for human-AI interaction.

Pre-training on extensive textual data has equipped ChatGPT with the capacity to comprehend linguistic subtleties and produce remarkably accurate responses, even in unclear and complex situations. Its adaptability and dynamism stem from its ability to learn from both organized and unstructured input, enhancing user engagement. The model's development involved a two-phase procedure consisting of unsupervised pretraining and supervised fine-tuning. In the pre-training phase, the model was trained on a sizable corpus of text using unsupervised learning methods like language modeling and masked language modeling, aimed at comprehending the intricate relationships between words and sentences as well as the structure of natural language.

Following pre-training, the model underwent fine-tuning, which involved training on labeled datasets containing input-output pairs relevant to specific tasks such as text completion, question-answering, and dialogue production. Iterative adjustments of the model's parameters aimed to minimize differences between anticipated outputs and appropriate labels, enhancing its performance.

However, the emergence of tools like ChatGPT has sparked ethical debates within the education community, particularly regarding concerns about plagiarism, duplicity, and the potential impact on critical thinking skills. Despite these concerns, research and user feedback indicate that ChatGPT demonstrates exceptional performance in various natural language-related tasks, including translating, answering queries, summarizing, and composing well-structured essays.

Moreover, ChatGPT's recent availability for public testing has garnered attention for its capacity to teach scientific concepts and generate original humor. As a conversational AI tool, ChatGPT is designed to respond to human-sounding text input in a conversational setting, engaging users in dialogue and providing contextually relevant responses.

The development of ChatGPT builds upon previous milestones in the GPT series, including GPT-1 in 2018, GPT-2 in 2019, and GPT-3 in 2020. Notably, the introduction of Instruct GPT demonstrated improved instruction-following ability and reduced fabrication of facts. ChatGPT's launch in November 2022 quickly gained popularity, reaching 100 million monthly active users within two months. It has been utilized across various industries, particularly in education, where it shows potential in automated assessment grading, guidance, and material suggestion.

ChatGPT's integration with other AI tools like DALL-E and Bing's AI features further expands its utility. Comparative studies have shown ChatGPT's outperformance in various tasks compared to its predecessors, including coding challenges and AP exams. Overall, ChatGPT's development signifies a significant advancement in natural language processing, with implications spanning multiple domains and industries.

LITERATURE REVIEW

- Jiang & Farhadi (2020) emphasize how students appreciate ChatGPT's accessibility and convenience, enabled by its round-the-clock availability and compatibility with various devices. This accessibility empowers students to seek assistance and information at any time, enhancing their learning journey with immediate responses and personalized support.
- Cramer et al. (2020) underscore the importance of swift assistance in busy academic settings, where students value immediate clarification and guidance without the constraints of waiting for human responses. This instant support fosters independence and efficient time management, ultimately enhancing student success.
- Hsu et al. (2021) highlight ChatGPT's prompt assistance with assignments and homework, aiding students in various tasks and providing tailored responses that enhance learning and save time. This personalized approach promotes a more efficient academic experience.
- Rajendran & Gupta (2021) emphasize ChatGPT's role in simplifying complex subjects through explanations, illustrations, and summaries, facilitating deeper understanding and mastery of challenging topics.
- Zhang et al. (2022) underscore the engaging nature of ChatGPT's conversational style, which fosters motivation and active participation among students. This interactive approach enhances learning dynamics and encourages deeper engagement with educational content.
- Ebbesen et al. (2020) highlight students' motivation to use ChatGPT when it simulates natural conversations, fostering engagement and collaboration. The conversational interface allows for personalized learning experiences tailored to individual preferences.
- Hsieh & Wu (2021) stress ChatGPT's personalized responses, which cater to each student's unique learning style and pace, fostering a more effective and engaging learning experience.
- Wang et al. (2021) further emphasize ChatGPT's role in providing personalized recommendations and study schedules, keeping students motivated and focused on their academic goals.
- Zhao et al. (2020) highlight ChatGPT's value in providing personalized support and fostering engagement and collaboration among students. The tool's capacity to simplify complex concepts aids comprehension and contributes to academic success.

- Chen et al. (2021) stress ChatGPT's personalized study support, which enhances learning efficiency and engagement, particularly for students seeking assistance with writing skills and personalized study plans.
- Liu et al. (2022) emphasize ChatGPT's ability to complement traditional teaching methods, providing additional support and diverse learning resources that contribute to enhanced learning outcomes.

Research Methodology

3.1 Research design: This research project aims to examine the impact of individual personality traits and factors on the adoption of ChatGPT among university students in Jalandhar, Punjab, India. To accomplish this, a survey was conducted among officials from various universities, employing a questionnaire with a sample size of 100. The survey was designed to gather data on the respondents' familiarity, opinions, and utilization of ChatGPT, as well as their perceptions of the tool's effects on their educational experience.

3.2. Objectives of the study: The main objective to conduct this research is to Examining the role of personality traits and factors for ChatGPT adoption Among university students.

• To analyze the relationship of personality traits and factors in Chat-GPT adoption among university students.

• To analyze the impact of personality traits and factors in Chat-GPT adoption among university students.

3.3. Hypotheses: A hypothesis is a proposed explanation for a reason. For it to be considered a reliable speculation, it must be testable under a trustworthy system. Experts usually base genuine hypotheses on previous observations that the available sensible ideas cannot adequately address. Although the terms "hypothesis" and "hypotheses" are sometimes used interchangeably, a rational theory is not the same as an educated guess. A working supposition is a hypothesis presented for further inquiry in a system that begins with an informed measure or idea.

Null hypothesis is taken as H0 and alternate hypotheses is taken as H1

H0: Agreeableness does not have a significant influence on ChatGPT adoption

H1: Agreeableness has a significant influence ChatGPT adoption

H0: Conscientiousness does not have a significant influence on ChatGPT adoption

H1: Conscientiousness has a significant influence on ChatGPT adoption

H0: Neuroticism does not influence ChatGPT adoption

H1: Neuroticism has a significant influence on ChatGPT adoption

H0: Openness to new experience does not influence ChatGPT adoption

H1: Openness to new experience has a significant influence on ChatGPT adoption

H0: Extraversion does not influence ChatGPT adoption

H1: Extraversion has a significant influence on ChatGPT adoption

H0: Perceived usefulness: Perceived usefulness does not influence ChatGPT adoption

H1: Perceived usefulness: Perceived usefulness has a significant influence on ChatGPT adoption

H0: Perceived ease of use: : Perceived ease of use does not influence ChatGPT adoption

H1: Perceived ease of use: : Perceived ease of use has a significant influence on ChatGPT adoption

H0: Behavioral intention: Behavioral intention does not influence ChatGPT adoption

H1: Behavioral intention: Behavioral intention has a significant influence on ChatGPT adoption

Research Methodology: For this study, a questionnaire has been employed as the primary research tool. The questionnaires will be disseminated to university students in Jalandhar in the form of an online survey. The sample size for this research is 100, representing the university student population.

Choice of Research Tool: The questionnaire was selected for this study due to its reliability and efficiency in gathering information from a diverse group of respondents in a timely manner.

Data Collection: The data collection comprises both primary and secondary sources. Primary data refers to information gathered firsthand, which has not been published previously, and is considered more reliable, authentic, and objective. In this study, structured questionnaires are used as the primary data source. Secondary data, on the other hand, is collected from various sources such as research papers, internet resources, and general websites.

3.6 Methods of Data Analysis: The evaluation of the review findings was depicted through the creation of tables and outlines utilizing the Likert scale and Ratio examination within Excel. Additionally, the analysis of the results was conducted manually, focusing on identifying key words, phrases, and grouping them together to identify patterns and trends in the respondents' answers.

The Likert scale, commonly employed in survey research, served as the primary method of scaling responses. This scale provides respondents with a range of options, such as "Strongly agree," "Agree," "Neutral," "Disagree," and "Strongly disagree," offering a nuanced approach to gathering data.

In this investigation, a purposive sampling technique was employed. This method enables the selection of participants based on specific criteria that are relevant to the research objective.

DATA ANALYSIS & INTERPRETATION

4.1 METHODS & TECHNIQUE OF DATA ANALYSIS

Data Analysis Concept

It is a process in which raw data is collected and analyzed to extract meaningful information. The process of sorting through and interpreting data is crucial for uncovering its underlying insights. There are various methods through which individuals can approach data analysis, and it is important to be mindful during this stage to avoid bias or manipulation of the data towards certain conclusions or agendas. Therefore, attentiveness is key when data analysis is undertaken insuring a careful analysis of the information itself as well as the conclusions derived from it.

4.2 Tools for Analysis

Given that no study can be successfully conducted without the appropriate tools and techniques, the same applies to my project. To ensure clear presentation and accurate explanation, I relied heavily on statistical and computer tools. I am immensely grateful to these tools for their invaluable assistance throughout the project. The fundamental tools I utilized from statistics are outlined below:

- Cross tabs
- SPSS software

Detailed analysis and interpretation

The questionnaire was filled by university students , and this was conducted through online form. on the basis of their responses various data is obtained regarding an empirical investigation on Examining the role of personality traits and factors for ChatGPT adoption Among university students.

Model	Un-standardized Coefficients	Standardized Coefficients	Significance
Constant	0.15		
NR	0.17	0.26	0.045
CON	0.12	0.28	0.035
AGR	0.24	0.24	0.18
OPN	0.26	0.32	0.036
EXT	0.35	0.37	0.38
PU	0.38	0.27	0.27
EU	0.25	0.29	0.017
BI	0.26	0.22	0.035
$R^2 = 0.41$ Adjusted $R^2 = 0.39$			

Model-

ChatGPT Adoption= $\alpha_0 + \beta_1 NR + \beta_2 CON + \beta_3 AGR + \beta_4 OPN + \beta_5 EXT + \beta_6 PU + \beta_7 EU + \beta_8 BI + e$

If p value is less than 5 %, then null hypothesis is rejected.

The Un-standardized Coefficients and standardized Coefficients of Neuroticism are 0.17 and 0.26 respectively. The P value is 4.5 % and it shows that the null hypothesis is rejected. It means Neuroticism has a significant effect on ChatGPT adoption.

The Un-standardized Coefficients and standardized Coefficients of Conscientiousness are 0.12 and 0.28 respectively. The P value is 3.5 % and it shows that the null hypothesis is rejected. It means Conscientiousness has a significant effect on ChatGPT adoption.

The Un-standardized Coefficients and standardized Coefficients of Openness to new experience are 0.26 and 0.32 respectively. The P value is 3.6 % and it shows that the null hypothesis is rejected. It means Openness to new experience has a significant effect on ChatGPT adoption.

The Un-standardized Coefficients and standardized Coefficients of Behavioral intention are 0.26 and 0.22 respectively. The P value is 3.5 % and it shows that the null hypothesis is rejected. It means Behavioral intention has a significant effect on ChatGPT adoption.

The Un-standardized Coefficients and standardized Coefficients of Perceived ease of use are 0.25 and 0.29 respectively. The P value is 1.7 % and it shows that the null hypothesis is rejected. It means Perceived ease of use has a significant effect on ChatGPT adoption

The Un-standardized Coefficients and standardized Coefficients of Agreeableness are 0.24 and 0.24 respectively. The P value is 18% and it shows that the null hypothesis is accepted It means Agreeableness has not a significant effect on ChatGPT adoption

The Un-standardized Coefficients and standardized Coefficients of Extraversion are 0.24 and 0.24 respectively. The P value is 38% and it shows that the null hypothesis is accepted It means Extraversion has not a significant effect on ChatGPT adoption

The Un-standardized Coefficients and standardized Coefficients of Perceived usefulness are 0.38 and 0.27 respectively. The P value is 27% and it shows that the null hypothesis is accepted It means Perceived usefulness has not a significant effect on ChatGPT adoption

Data interpretation and analysis are critical to developing sound conclusions and making better informed decisions. The data is very likely to be arrived from the survey made through a questionnaire and responses has been collected from the selected areas of Punjab. The data has been analysed by using the various pie charts and graphs. The pie charts have made it easy to easily interpret the data in proportionate form. The observations are made based on the readings of the results of various charts and their percentages. Every question asked in the survey are designed in a manner that will fulfil the objectives of the project work so that the relevant results could be obtained. Every figure and graph are elucidated based on the proportions they have shown in the responses collected.
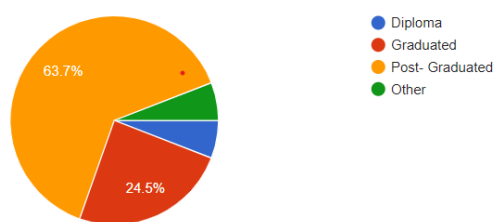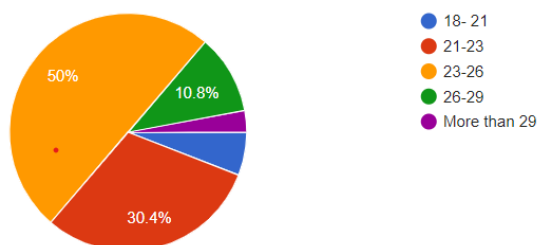

Interpretation

Post-graduate students, comprising 63.7%, Favor Chat-GPT over other students and diploma holders. They utilize it for various tasks like question generation, grammar checks, summaries, and study plans. Chat-GPT's contextual understanding and recall capabilities make it a valuable tool, but users must exercise caution, verify outputs, and uphold academic integrity.
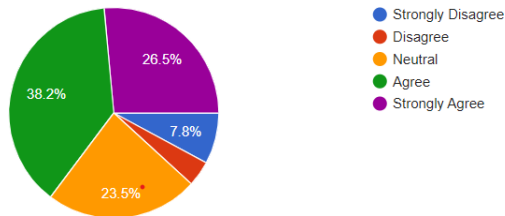

Interpretation

Students aged 23-26 years prefer using Chat-GPT more, followed by those aged 21-23 years. The rest of the age groups do not use it as actively or regularly. This trend indicates that older students may find Chat-GPT more useful for their academic needs, possibly due to its ability to generate practice questions, assess grammar and spelling, provide summaries and analyses, and craft personalized study plans

30.Chat GPT is use full.

102 responses

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Interpretation

The study reveals that 38.2% of students strongly agree and 26.5% agree that Chat-GPT is useful, while 23.5% are neutral and 7.8% strongly disagree. This suggests that a significant portion of students find value in Chat-GPT, possibly due to its ability to help them find information quickly and enhance their learning abilities

FINDINGS:

Adoption of ChatGPT is significantly impacted by neuroticism, conscientiousness, openness to new experiences, behavioral intention, and perceived ease of use. Adoption of ChatGPT was found to be positively correlated with neuroticism, conscientiousness, openness to new experiences, behavioral intention, and perceived ease of use.

This suggests that those who score better on these characteristics or attributes are more likely to use ChatGPT. The relative significance of each predictor is revealed by the standardized coefficients. Openness to New Experiences has the highest standardized coefficient of all the psychological qualities studied, indicating that it may be the most significant factor in predicting ChatGPT adoption. Each predictor's null hypothesis being rejected indicates that Evidence shows that each of these factors may have a statistically significant effect.

Agreeableness: According to the investigation, ChatGPT adoption is not significantly impacted by agreeableness. This indicates that individual differences in Agreeableness do not seem to correlate with individual differences in ChatGPT adoption likelihood.

Extraversion: Likewise, the data indicates that ChatGPT adoption is not substantially impacted by Extraversion. There does not appear to be a correlation between an individual's extraversion degree and their likelihood of using ChatGPT.

Perceived Usefulness: The results indicate that ChatGPT adoption is not significantly impacted by perceived usefulness. This suggests that people's opinions of ChatGPT's utility have little effect on their choice to use it.

CONCLUSION

The research findings indicate that the adoption of ChatGPT among university students is significantly impacted by personality traits, particularly neuroticism, conscientiousness, and openness to new experiences

These traits are positively correlated with ChatGPT adoption, suggesting that students who score better on these characteristics are more likely to use ChatGPT. Among these traits, openness to new experiences has the highest standardized coefficient, indicating that it may be the most significant factor in predicting ChatGPT adoption

Agreeableness and extraversion, on the other hand, do not have a significant impact on ChatGPT adoption
This suggests that individual differences in these traits do not correlate with individual differences in ChatGPT adoption likelihood.

Perceived usefulness does not significantly impact ChatGPT adoption, indicating that people's opinions of ChatGPT's utility have little effect on their choice to use it

The adoption of ChatGPT may also be influenced by other factors such as social impact, domain experience, technology familiarity, system quality, training and support, interaction, performance expectancy, effort duration, societal influence, facilitation conditions, anthropomorphism, design novelty, trust or institutional policies.

In conclusion, personality traits, in particular openness to new experiences, play a key role in the adoption of ChatGPT among university students. However, a role can also be played by additional factors including societal influence, domain experience, technology familiarity, system quality, training and support, interaction, performance expectation, effort expectancy, environmental influences, facilitation of conditions, anthropomorphism, design novelty, trust or institutional policies.
Therefore, it is important to consider these factors when designing and implementing ChatGPT adoption strategies.

RECOMMENDATIONS

Promote Openness to New Experiences: Since openness to new experiences is the most significant predictor of ChatGPT adoption, educators and administrators should encourage students to be open to new learning experiences and technologies . Creating a culture of innovation and experimentation in the classroom, as well as giving students an opportunity to experience new technologies and applications, can achieve this.

Ensure Reliability and Accessibility: ChatGPT's technical flaws, such as network errors, login loops, and delayed responses, can impact its adoption potential. Ensuring that ChatGPT is reliable and accessible to university students is therefore important. This can be achieved by improving the system's capabilities, reliability and speed with a view to ensuring that it is easily accessible for students.

Leverage Social Influence: Social influence can be a powerful factor in promoting the adoption of new technologies. In order to foster the adoption of ChatGPT, educators and administrators should be able to leverage society's influence. To this end, the establishment of ambassador programmes, promotion of a tool among peers and creating platforms to allow students to share experiences and views on ChatGPT can be achieved.

Promote Perceived Usefulness: In the adoption of ChatGPT in the learning process, perceived usefulness is an important factor. To this end, it is important that teachers and administrators emphasise the use of ChatGPT's natural language processing capabilities in order to help students synthesise information, create summaries or develop new ideas.

Consider Additional Factors: Other factors such as social influence, domain experience, technology familiarity, system quality, training and support, interaction, performance expectancy, effort expectancy, facilitating conditions, anthropomorphism, design novelty, trust, and institutional policy may also influence ChatGPT adoption. Therefore, it is important to consider these factors when designing and implementing ChatGPT adoption strategies.

Address Perceived Risks: The decisive factor for the adoption of ChatGPT in teaching and learning processes may be a perception of the risks associated with its use. Consequently, by setting up more rigorous use policies and procedures, it is essential to tackle identified risks such as security risks, privacy issues, unreliable information, the risk of accusation of plagiarism or violation of academic policy.

Consider country, age, university type and recent academic performance: Multivariate analysis showed that the attitude towards ChatGPT use was significantly influenced by these characteristics. Therefore, when developing and implementing strategies for the adoption of ChatGPT it is important to take into account these factors..

Create a Positive Organizational Culture : The attitudes, beliefs and behaviors of individuals within an organisation are greatly influenced by organizational culture. A positive result can be achieved, ultimately leading to a more widespread adoption of technology by university students, if an organisational culture is favourable in favour of technical developments and promotes their use. A positive organizational culture which supports the adoption of ChatGPT should therefore be created.

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