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Evaluating the effectiveness of chat GPT in promoting academic success through assignment solving among graduate students in the University of Louisiana Lafayette

Akintunde Nelson Oshodi *

Faculty of Communication, University of Louisiana at Lafayette.

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Abstract

Artificial Intelligence (AI) has transformed various sectors, including education, with tools like Chat GPT offering new possibilities for academic support. This study examines the effectiveness of Chat GPT in promoting academic success among graduate students at the University of Louisiana at Lafayette. Using the Diffusion of Innovation theory as a framework, the research aims to assess how frequently graduate students use Chat GPT for assignment solving, its impact on their learning outcomes, and the perceptions surrounding its use. Through an online survey design, data will be collected from graduate students to evaluate their knowledge of Chat GPT, its role in enhancing assignment performance, and any improvements in academic grades. The survey will employ a combination of Likert scale and closed-ended questions to measure key variables, including the students' perceptions, usage frequency, and the tool's influence on their academic creativity and success. The findings will contribute to understanding how AI-driven tools like Chat GPT can be effectively integrated into academic settings, while also addressing the concerns of educators regarding its potential misuse or negative effects.

Keywords: Academic Success; Chat GPT; Assignment Solving; Education; Technology

1. Introduction

1.1. Statement of the Problem

AI has quickly advanced in recent years and is now being used in various disciplines,ranging from driving growth in business, healthcare (Xu, Sanders, Li, & Chow 2021), finances, and education (Zawacki-Richter, Marín, Bond, & Gouverneur 2019).

AI systems are trained using human data input to perform time-consuming tasks that aretypically carried out by humans which has improved and enhance efficiencies in varioussector.

In our modern, fast-paced world, where efficiency and accuracy are paramount, traditional systems often fall short. This has led to the emergence of chatbots as a necessary solution. Unlike manual systems like Google search and Bing, chatbots are capable of swiftlyand efficiently responding to commonly asked questions. Essentially, a chatbot is a software designed to interact with humans. Thanks to the advancements in Artificial Intelligence (AI),chatbots have become a powerful tool for facilitating seamless human-machine interaction (Rane, Ranade, Chinmay, Hardik, Riva & Vidya 2022)

* Corresponding author: Akintunde Nelson Oshodi

OpenAI has made significant advancements in natural language processing with the development of GPT-1, GPT-2, and GPT-3 models. GPT-1, introduced in 2018, utilized thetransformer model to learn from text corpora and improve language algorithm models (Finnie-Ansley et al., 2022). By utilizing more transformer decoders and richer corpora for improved training efficiency and accuracy, GPT-2, announced in 2019, built upon the fundamental concepts of GPT-1 (Henrickson and Meroo-Peuela, 2022). The 2020 release ofGPT-3 demonstrated greater performance on a variety of language tasks and had a substantially higher number of parameters (Chan, 2022).

The most recent language model to be added to OpenAI is Chat GPT, which was released in November 2022 and is based on the GPT-3.5 architecture. To build an intelligentmodel capable of extracting useful information and producing complex and human-like responses, Chat GPT makes use of enormous datasets, strong computer resources, and effective algorithms (Abdullah et al., 2022), which became one the fastest-growing user application in history, with an impressive 100 million active users within just two months ofits launch in January 2023 (Reuter 2023). It enables natural multi-turn human-computer interaction and can analyse user input to better understand intent and provide relevant feedback.

Chat GPT has gained widespread adoption among various user groups and organizations, including students, teachers (Zhai 2022), medical practitioners, and business professionals. Its usage extends to seeking solutions and enhancing the efficiency and effectiveness of business operations (Raj, Singh, Arpit, Vimal, Verma, 2023). This technology is not only greatly impacting and shaping how society produces, lives, and communicates, but it is also fundamentally changing society and the very nature of humanityitself (Hill-Yardin et al., 2023).

On March 14th, 2023, OpenAI released GPT-4, the latest generation of their multimodal language model. GPT-4 surpasses its predecessor, GPT-3.5, by incorporating image and text input, enhancing reasoning abilities, understanding complex issues, and code writing capabilities. It also exhibits breakthroughs in image recognition, text input limitations, and answer accuracy, enabling more detailed instructions, diverse text generation, and improved performance, however, it is not available for free like Chat GPT 3.5 (Open AI, 2023).

1.2. Purpose of this study

The recent launch of Chat GPT has raised concerns and controversies among various educational institutions regarding its potential threats. It has been noted that Chat GPT poses challenges in the educational sector, particularly in terms of the accuracy and reliability of thebot (Sallam, 2023), as well as the difficulty in detecting plagiarism (Ventayen, 2023).

As graduate students at the University of Louisiana Lafayette engage in their studies, they are involved in various assignments, tests, and research projects. The initial phase of thisstudy aims to examine the overall usage of Chat GPT in their academic pursuits and assess itsimpact on their learning experience.

Drawing upon the Diffusion of Innovations theory and its application in educational communication (Rogers, 2003), this study will investigate the utilization of Chat GPT amonggraduate students at the University of Louisiana Lafayette. The objective is to determine the frequency of its usage, its purpose, and how it has contributed to their academic performance.

2. Literature Review

2.1. Diffusion of Innovation Theory

The diffusion of innovation theory is widely used to understand how new technologies are adopted in information systems over the past two decades. Rogers (1995) defined it as the, “process by which an innovation is communication through certain channelsover time among the members of a social system.”

The core constructs of diffusion of innovation theory, according to Rogers (2003), arethe qualities of the innovation, communication routes, social system, and time. Individuals ora social system may see an innovation as a new idea, practise, or thing. The features of an innovation are influenced by five elements. The relative advantage of an innovation relates tohow much better it is than what it replaces. Compatibility refers to how well the innovation connects with potential users' values and needs. The perceived difficulty or ease of adopting the invention is referred to as complexity. The capacity for potential adopters to experiment with the invention before fully embracing it is referred to as trialability. The extent to which the results of adopting the innovation are evident to the adopters is referred to as observability.

As per Rogers (2003), the social system encompasses the boundaries within which aninnovation spreads. In the context of universities and educational departments, these entities serve as components of the social system. On the other hand, communication channels play acrucial role in transmitting messages about the innovation from one individual to another, as explained by Rogers (2003).

Innovation diffusion has been examined in a variety of fields, including education, health, agriculture, the environment, media and politics. The acceptance and dissemination ofinnovative practises, technologies, and policies in these industries has been studied using diffusion of innovation theory. Researchers and practitioners can improve the implementation and efficacy of educational initiatives in these sectors by studying how innovations areadopted and diffused within these sectors.

2.2. Educators' Resistance to Chat GPT

The development of AI technology has sparked a debate between those who support and encourage its progress and those who believe it poses risks that need to be handled with caution. Following South Wales' lead, other Australian states like Queensland, Tasmania, andWestern Australia have also banned students from using Chat GPT (Deshpande and Szefer, 2023). Other institutions that have instituted prohibitions or restrictions on Chat GPT usage include Sciences Po in Paris, RV University in Bangalore, the University of Hong Kong, and Seattle public schools (Zhou et al., 2023; Yadava, 2023; Chan and Hu, 2023).

Elon Musk and Yoshua Bengio were among the famous people that signed a letter inApril 2023 that demanded a 6-month halt to the development of AI technology and the elimination of huge models like GPT-5 (Samuel in 2023). This letter sparked debates about the balance between AI development and managing potential risks.

Studies have shown the potential of Chat GPT in domains like medical examinations and scientific research. Chat GPT achieved high accuracy rates in the United States Medical Licensing Examination (Doshi et al., 2023). Researchers have also used AI technology, including Chat GPT, to write and publish academic papers, raising concerns about authorship and scientific transparency (Bai et al., 2022; Thorp, 2023; Nature, 2023).

The application of Chat GPT has sparked interest in the academic sector, but scholars have expressed concerns about its feasibility and potential negative consequences. Challengessuch as data quality, knowledge limitations, ethical issues, technical dependence, and misuse have been identified (Alshater, 2022). Other concerns include poor communication, comprehending abilities, insufficient contextual understanding, and privacy hazards (Baidoo-Anu and Owusu Ansah, 2023). Biases and incorrect information in generative AI systems such as Chat GPT pose moral problems (Qadir, 2022). Scholars emphasise the importance of doing a thorough study, overcoming obstacles, preserving privacy, and encouraging collaboration between AI and human teachers in order to maximise benefits and minimise negative consequences.

2.3. Chat GPT as an Educational Resource

According to Hao (2023), Artificial Intelligence (AI) is very important in education. Itprovides a lot of information through online learning and virtual labs, which helps educators and students learn in a broader and more open way.

Chat GPT is a type of advanced AI technology that can be used in education, some educators believe that instead of banning it, schools should use it carefully as a teaching tool, which can help students be more creative, get personalized tutoring, and prepare for future AIsystems (Roose, 2023).

Chat GPT is a great educational tool that may help with the creation of educational content as well as language acquisition. It can generate diverse documents, including as papers and textbooks, with little human intervention, making it useful for educators and students. Incorporating Chat GPT into the classroom can improve the learning experience,and students can use it for self-inquiry and information expansion.

Professor Bhaskar Vira of the University of Cambridge recommends for university students to fully utilise AI technologies such as Chat GPT to improve knowledge acquisitionand learning efficiency. However, he emphasises the significance of preserving academic integrity through the adaptation of teaching techniques and examination standards (Stephens,2023). Similarly, University of California Professor John Villasenor enables students toutilise Chat GPT in assignments but emphasises the importance of teaching students how to use these technologies successfully and responsibly (Villasenor, 2023). It is critical to strike abalance between students' rights to use AI tools independently and academic integrity requirements, ensuring responsible and meaningful usage.

Technology is developed to make our lives better, and we should use it wisely to make new discoveries. Chat GPT is the latest AI achievement, and we should use it fully instead of banning it (Ke et al., 2021). Many people want to use Chat GPT for learning and writing, so it shows that there is a high demand for new technologies in education (Ke et al., 2021). While schools may limit its use for younger students, higher education students shouldlearn how to use available resources and tools effectively to succeed, and they need to develop skills that work well with AI technology to stay competitive in the job market (Ke et al., 2021).

Blended learning, which combines online and in-person learning, is becoming more popular. AI technologies like Chat GPT can be useful for improving academic performance. But we need policies and rules to make sure students act ethically and honestly. Governmentsand schools should invest in research and development to improve education in the era of Chat GPT (Ke et al., 2021).

2.4. Research Question and Hypothesis

This study aims to investigate the impact of using Chat GPT as a supportive tool for assignment solving among graduate students at the University of Louisiana Lafayette. The research seeks to address the resistance of educators towards the use of Chat GPT as touchingthe negative impact it brings.

The research question is: Does the use of Chat GPT in assignment solving contribute to higher assignment grades? The hypothesis states that graduate students who use Chat GPT

to complete assignments perform better academically and are more creative. If they effectively use the tool's prompts and features to minimize any potential negative effects, it isanticipated that students will continue to learn well with the interactive bot and succeed in their studies.

3. Methodology

3.1. Research Design

Most of the research on student perceptions of AI utilizes a quantitative survey design(Bisdas et al., 2021; Dahmash et al., 2020; Gherhes & Obrad, 2018; Yüzbaşioğlu, 2021). In this study, we will employ a survey design to gather data from graduate students at the University of Louisiana at Lafayette, exploring their usage, performance and perceptions of Chat GPT in their learning experiences.

To gain a deeper understanding of how Chat GPT is adopted and utilized among graduate students, we are conducting an online survey targeting graduate students at the University of Louisiana at Lafayette. The study employs an online questionnaire to collect data. The questionnaire consists of two sections: the first section captures respondents' demographic profile and capabilities, while the second section covers the variables of interest. The survey topics encompass respondents' knowledge of Chat GPT and how it enhances their learning and performance in solving assignments, as well as improvements intheir grades.

The survey format will include a combination of selection questions, "yes" or "no" questions, and a series of Likert scale questions using a 5-point scale with responses rangingfrom (strongly disagree), through 3 (undecided) to 5 (strongly agree).

3.2. Procedure

To engage graduate students in the survey, we will seek support from the Universityof Louisiana at Lafayette's Graduate School. We will also interact with faculty members or department heads to assure the survey's effectiveness. This collaboration would entail acquiring authorization to access student contact information as well as coordinating survey dissemination. The email would include a clear and simple introduction to the study, outlining its aim, objectives, and potential advantages. It will also emphasise the voluntary nature of participation and reassure participants that their confidentiality will be kept secure and anonymous. The informed consent page, which participants must accept and consent to,will include a thorough explanation of the study's methods, potential risks and benefits, and participant rights. It will also detail how the data will be maintained, evaluated, and reportedto ensure compliance with ethical norms and data protection legislation.

3.3. Variables

The key variable for this study is the graduate student at the university of Louisiana at Lafayette. The dependent variable is the knowledge of Chat GPT and the usage of Chat GPTin solving assignments. This variable will provide valuable insights required for the research.

3.4. Limitations

There are a few limitations to consider when interpreting the findings of this study.

Firstly, the sample size is relatively small, so the results may not be applicable to all graduatestudents at the University of Louisiana Lafayette. The study's reliance on self-reported data introduces the potential for biases, as participants may have a tendency to present themselvesin a favorable light or not be completely truthful when reporting their usage of Chat GPT.

Additionally, the study design was cross-sectional, so it couldn't capture changes instudents' perceptions over time as they interacted more with Chat GPT.

To address these limitations, future research should use larger and more diverse samples, employ longitudinal designs to track changes in students' perceptions and usage ofChat GPT over time, and investigate how these technologies can improve learning. It wouldalso be valuable to explore the literacy of undergraduate students in different educational contexts when it comes to using Chat GPT. Overall, more research is needed to better understand how to integrate generative AI into higher education while minimizing privacy and security risks. By exploring these areas, we can ensure responsible and effective use ofthese technologies in teaching and learning (Chan, C. K., and Hu, 2023)

4. Conclusion

This study seeks to determine the impact of Chat GPT on graduate students' academic success, focusing on assignment solving. The findings will provide insights into the tool's effectiveness, potential benefits, and challenges, while guiding educators on how to balance its usage to support learning without compromising academic integrity.

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