MSc Computer Science & Big Data Analytics

ChatGPT: The advancement of knowledge and incorporation for its users.

15/05/2023

Word Count – 3,000

# Abstract

# Introduction

## Background

ChatGPT, widely utilized by the public, corporations, and academia, prompts the question: how valuable is it for users? OpenAI introduced ChatGPT on November 30, 2022, as a conversational AI called ChatGPT (Generative pre-trained Transformer) [1]. Using Natural Language Processing (NLP), it provides comprehensive responses to user queries [2]. ChatGPT finds practical application in various scenarios, such as resolving user uncertainties, enhancing comprehension of topics, and generating stories or poems based on given keywords. While media and academic sources have covered ChatGPT extensively, limited research focuses on user perspectives due to its recent release.

## Scope for Research

This proposal aims to examine if ChatGPT enhances user knowledge and its integration into users' routines. Despite research on ChatGPT and its applications, such as solving programming bugs [4], providing education [6,8], and democratising knowledge [9], there is limited research on user perception. Tlili et al. [7] conducted a notable study addressing this gap, but due to ChatGPT's novelty, this proposed study aims to expand on it; aimed at users from the public to gain insights into their interactions and found usefulness.

The study aims to create a survey to test whether participants have used ChatGPT, if it has improved their knowledge, and if they now incorporate ChatGPT into their knowledge-seeking process.

The study can benefit academics, corporations, and the public by providing insights on the usefulness of ChatGPT compared to or alongside other knowledge-enhancing techniques like Google and social media. It has the potential to inspire further research in this area.

## Limitations

*Due to limited time and resources, only one survey will be conducted with mostly closed questions to gather prompt and enriching feedback. Additionally, the analysis will be limited to the collected data without comparison to other datasets, due to the lack of research in this area. It is important to note that bias may be introduced in this study as participants interested in the topic may be the only ones who choose to participate.*

## Ethical Issues

When the survey is conducted, the researcher will ensure informed consent from each participant, clarifying requirements, expectations, and the option to opt out. Participant data will be anonymised to protect identity, with some characteristics (such as age bracket, occupational background, and geographic location) used for research purposes only. The study allows participants of any gender, sexual orientation, race, or beliefs. No conflicts of interest are anticipated, and there are no expected risks or dangers for participants.

# Literature Review

## Introduction

ChatGPT – also known as Chat Generative Pre-Training Transformer – is a large language Model (LLM) Artificial Intelligence (AI) tool created by Open AI to answer a user’s request via the use of Natural Language Processing (NLP) tasks [1]. Since its inception, ChatGPT is applied in various practices such as essay writing, fact checking, and idea generation [3]. However, as well as answering these types of user request, does ChatGPT provide further education or knowledge enhancement for its users? Therefore, this literature review aims to examine currently available research – or lack thereof - on whether users get to enhance knowledge further in that area from the perspective of the user, and if so, is ChatGPT being incorporated more into their day-to-day activities an effect.

## Providing knowledge enhancement and day to day incorporation for its users

A study seen from Surameery and Shakor [4], examines the use of ChatGPT in solving programming bugs, both in terms of debugging assistance and explanations. Furthermore, the capabilities and representation of knowledge from this AI tool were explored, concluding that ChatGPT could be a benefit for developers in bug fixing. Additionally, this paper mentions how ChatGPT can be a part of a comprehensive toolkit to solve problems and provide explanation alongside other tools. However, this paper focused on the application use of the software rather than gaining perspective from the user, which could overlook many insights on the user’s enhancement from bug fixing. Furthermore, although this helps to answer whether a user could incorporate ChatGPT into day-to day activities, the limitation of this paper is that no further research was conducted to explore this concept for users.

Aljanabi [5] explains how ChatGPT can provide possibilities and future directions for users and the software itself. Additionally, describing how ChatGPT has potential to provide user personalisation, and alluding to integration for different working fields; yet this paper provides more of a general view on possibilities of the tool, than to see how users interact with it.

An excerpt from Liberman [6] suggests ChatGPT as a tool to explore sources of information for users, including for students as a primary user, to assist with understanding context of a subject. Although, Liberman does go further to say that ChatGPT is not perfect, and there are some areas where it may not provide accurate information for its user. Again, this source provides only a highlight of how it can provide knowledge enhancement and detail is missing to explain this further.

Tlili et al [7] shows a more comprehensive case study on the use of ChatGPT, and its perception from the public, as well as initial user interactions and experiences. A series of analyses were conducted including Twitter network and sentiment analysis on tweets relating to ChatGPT. Additionally, interviews were conducted on participants, quoting that ChatGPT could be used as a learning aid, or idea generation. The paper concluded, stating that ChatGPT is a powerful educational tool, with limitations such as a focus on early adopters of the tool, with a small number of participants. Finally, this paper has performed some great groundwork for this proposal in question and hoping to extend the results from this study further by providing additional insight since its publication.

A study produced by Kung et al [8] explored the performance of ChatGPT on the United States Medical Licensing Exam (USMLE). Although this research’s primary focus was on testing performance on the exam above, a discussion is made on the results on whether the AI tool can assist in knowledge enhancement of users in medical education who are taking such an exam by gaining insight into areas that needs development. However, limitations of this research keep it focused on ChatGPT and its output from USMLE, although alluding to explore both use of knowledge enhancement for medical students taking the exam and further incorporation into day-to-day use. Additionally, no medical student participation is shown against this study to explore the improvement of scoring in the USMLE.

Yue et al [9] explores the use of ChatGPT in providing financial knowledge to non-financial users. The study goes further by stating that ChatGPT has the potential to empower individuals in gaining financial knowledge to help make informed decisions. Additionally, tests were performed on how the AI tool, explains definitions of financial terms and metrics, as well as explaining SHAP scores based on different publication approaches. Whilst the study goes in depth testing the capabilities of ChatGPT and the responses it provides and how this can help others gain new knowledge in the financial space, there is no evidence of testing these prompts against participants and to determine from them whether this information provided is something that can be understood and learnt, or if this can be incorporated into a laypersons day-to-day routine to expand their knowledge further.

## Conclusion

The purpose of the literature in question was to evaluate the current research available on participants who have used ChatGPT, and whether a) it has enhanced their knowledge either generally or within a specific realm, or b) if so, if ChatGPT has been incorporated into their day-to-day activities. It appears though this review, that the use of ChatGPT is still novel, since its release from Open AI late 2022; and whilst at least one paper has made some progress in this area, the belief is that there is a gap within the research space on the accommodation of participants and understanding their interactions rather than separate stand-alone studies of the researcher or topic alone.

# Research Hypothesis and Questions

The following information below represents a set of two hypotheses to be explored as part of the study, where the first hypothesis has an impact on the second hypothesis.

## 3.1. Research Hypotheses

1. “The utilization of ChatGPT increases the likelihood of enhancing a user's knowledge on a specific topic.”
2. “Users who perceive ChatGPT as enhancing their knowledge are more likely to incorporate ChatGPT into their routine for knowledge acquisition compared to those who do not perceive ChatGPT as enhancing their knowledge."

Based on these hypotheses proposed, there are potential leading questions that could be answered to re-confirm or extend the response further.

## 3.2. Research Questions

As well as the hypotheses to explore, there is potential to ask additional research question to provide further context in this area.

*1.* Is ChatGPT being used by the participant?

*2.* If ChatGPT is being used by the participant, did the use of it enhance a user’s knowledge based on what was submitted?

*3.* If ChatGPT did enhance a user's knowledge, has chatGPT been adopted for routine knowledge acquisition by the user?

# Methodology

# Ethical Approval

# References

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# Appendices