

In-Depth Exploration of LLM's Adoption in Shaping Future Expectations among Sri Lankan Undergraduates

M.F.F. Nuha¹, M.A.M. Afraj² and A.R.F. Shafana³

^{1,2}Department of Computer Science and Informatics, Uva Wellassa University of Sri Lanka.

³Department of Information and Communication Technology, South Eastern University of Sri Lanka.

¹ nuhajudge2012@gmail.com, ² afraj.2011@gmail.com, ³ arfshafana@seu.ac.lk

Abstract

An extensive language model called ChatGPT created by the OpenAI Foundation, has created a significant impact in academia and industries, especially due to its impressive performance, particularly in synthesizing human-like results from vast amounts of data. Despite numerous research efforts on top of ChatGPT, there is a paucity of literature providing in-depth analysis among undergraduates, the group that utilizes ChatGPT the most. Thus, this study addresses this gap through an in-depth analysis based on data collected through a structured questionnaire administered to 171 undergraduates. The questionnaire covered various aspects related to the usage of ChatGPT, including awareness, frequency of usage for learning, accuracy of information, perceived improvements, and future expectations from language models. Results indicate that ChatGPT is well-known and used frequently for academic reasons, especially for preparing assignments and exams. While most students appreciate LLMs, appropriately half have encountered partially accurate answers, revealing limitations in information accuracy. Some students emphasize the importance of promoting individual study and critical thinking skills, while others advocate for more comprehensive responses, including visuals and video lectures. Many students claim that LLMs have improved their academic performance, and LLMs tend to be favored among these undergraduates. These insights underscore the potential for LLMs like ChatGPT to transform learning and research experiences, emphasizing the need for ethical surveillance and adaptation to shifting student expectations while addressing issues of accuracy and bias. This positions LLMs as useful tools for knowledge acquisition and exploration in academia's changing digital landscape.

Keywords: Large Language Models (LLMs), ChatGPT, Chatbots, Undergraduates, Ethical Surveillance

I. INTRODUCTION

Technology developments have brought forth a new era of interaction and learning in the contemporary higher education landscape. The application of artificial intelligence (AI) in education is rapidly widening in response to changes in the teaching, learning, and assessment processes at all educational levels, from elementary to higher (Gamage et al., 2023). The potential for LLMs to have a big impact on undergraduate students' academic experiences makes them one of these developments to watch out for. Developments in the LLM's space have been accelerating at breakneck speed since late November 2022 (Rudolph, Tan and Tan, 2023). A variety of platforms have emerged as a result of LLM's technology being used by educational institutions; each is trying to provide the best user experience for supporting and engaging students.

The use of LLMs, which are built on the foundation of Natural Language Processing (NLP), which has the ability to engage students in lively conversational exchanges while answering questions, streamlining administrative procedures, and promoting engaging learning experiences. An important model in this field is ChatGPT, which is powered by the powerful language model created by OpenAI. A spectrum of other solutions, each positing certain strengths and features, has nevertheless also arisen in the dynamic environment of LLM's development. Therefore, it is crucial to thoroughly examine these alternatives, evaluating their efficacy, accuracy, and user happiness. This study conducts a thorough investigation into the effects of ChatGPT on higher education, focusing specifically on comparing ChatGPT with other LLM strategies. The emphasis is on evaluating their impacts and discerning the future expectations of undergraduate students. This investigation aimed to perform both analytical and empirical research, with the goal of conducting a detailed comparative analysis. It aims to compare

and contrast ChatGPT with the approaches of different LLMs while clarifying how undergraduate students' perceptions of ChatGPT and LLMs have become an essential element of their educational environment changes. This study strives to significantly impact to the conversation about the use of technology in education by contrasting its current impact with its future potential and highlighting how it aligns with the changing requirements of the digitally savvy undergraduate generation.

II. RELATED LITERATURE

The literature extensively covers the utilization of Language Models (LLMs) by undergraduates and the associated benefits. This section presents recent research findings specifically related to ChatGPT in the education domain. Additionally, it offers an overview of research conducted using ChatGPT across various academic disciplines, including Medicine, Computer Science, Engineering, and other applied sciences. ChatGPT having made significant strides in recent years, as a top AI language model, has a significant impact on scientific research in a variety of fields (Ray, 2023). Ray (2023) uncovers its history, uses, difficulties, and prospects for the future while highlighting the substantial ethical difficulties, including biases and privacy concerns. The study also cautions that while ChatGPT has the potential to bring about complete transformations in scientific research, as it garners increasing attention in academia, research, and enterprises, ethical issues must be carefully considered.

A. Ethical Considerations and the Possibility of Getting Caught

Khalil and Er (2023) discussed that ChatGPT is capable to produce complex text outputs without being easily detected by any plagiarism detection technologies. They further confirmed that the content produced by ChatGPT on a variety of subjects are very creative and appears to have been produced originally by someone which would eventually help students in accomplishing their tasks without great effort. This behavior underscores the necessity for institutions to adopt highly effective and efficient plagiarism detection tools.

Meanwhile, Perkins (2023) also highlighted the concerns towards academic integrity of students' usage of Artificial Intelligence (AI) tools

especially of the usage of Large Language Models (LLMs) such as ChatGPT in formal assessments. The potential of these tools for producing unique, cogent material that can resist detection by both skilled academic personnel and present technological means of detection highlights a serious issue for academic integrity regarding the usage of these tools. Similarly, Rahman and Watanobe (2023) discussed about the services provided by ChatGPT and the risks to the conventional research and education system, such as the potential for online exam cheating, the creation of text that resembles human writing, the loss of critical thinking abilities, and the challenges associated with evaluating the material produced by ChatGPT. The research mainly targeted the programming related contents generated from ChatGPT and judged the accuracy of them while conducting a survey on how undergraduate, graduate, and doctorate students and instructors use ChatGPT to enhance their programming learning and teaching. Meanwhile, in a recent work by Malinka et al (2023) expounded upon the acceleration of the learning process by students through the utilization of ChatGPT. This observation serves as a noteworthy indication of the preparedness of artificial intelligence tools to contribute significantly to the attainment of a university degree.

B. ChatGPT and other Alternative LLMs

Students employ ChatGPT not only as a supplementary tool for academic and research purposes but also actively explore alternative platforms, including Bing Chat, Bard, and Ernie (Motlagh *et al.*, 2023). Motlagh *et al.* (2023) compared these platforms as how those models were trained and how other platforms are being used while highlighting the meteoric rise of ChatGPT to one million users in just five days.

Another qualitative case study pinpointed ChatGPT as a fine and recent example of AI-powered LLMs using three steps (Tlili *et al.*, 2023). The steps included social network analysis of tweets, content analysis of interviews, and investigation of user experiences. A further sentiment analysis on the data collected demonstrated that positive sentiments (5%) outweigh negative sentiments (2.5%) with regards to the usage of Chatbots. Another research proposed a framework with the concept of changing pedagogical activities and facilitating interactive guidance between students and

instructors through intelligent chatbots built on generative artificial intelligence (GAI) technology (Ilieva et al., 2023). The framework showed that chatbots can help overcome the difficulty of providing tailored learning experiences for students. The researchers have further explored and compared the main characteristics of existing educational chatbots with advantages of the proposed framework for enabling the successful application of AI chatbots in education and offers a comprehensive grasp of their transformational potential. This study not only provides a comprehensive approach to improve the quality of education generally, but also harmonizes the use of intelligent chatbots in university teaching and learning activities.

III. MATERIALS AND METHODS

This study used a quantitative research strategy and collected data solely through a structured questionnaire. The main target group was the undergraduates of Sri Lankan state universities. The total number of data collected for the sample was 171. It is in line with the study of Ilieva et al. (2023) where they used a sample of 131 to develop a framework based on the response from students. All the participants were approached to receive the responses as higher as possible. The study utilized a structured questionnaire approach to limit the responses from only the undergraduate students of Sri Lanka in place of scraping data from social media in order to carry out a controlled study. Each administered with the study instrument via WhatsApp after validating that the respondent is an undergraduate. All these responses were received between 13th of September to 24th of September, 2023.

The survey included a series of questions to collect both demographic details and various factors related to the use of ChatGPT such as their awareness regarding the LLMs, the frequency of using ChatGPT for their learning and academic works, the accuracy of the information that they derived from ChatGPT for their intended work, the improvements that they have gained, and their future expectations from the LLMs with their satisfaction of this support. In addition to the above, we were interested to collect their opinions on security issues as well. The collected data were analyzed using basic statistical software and the results are presented in the following section.

IV. RESULTS AND DISCUSSION

This section presents the obtained results and their respective interpretations. Figure 01 depicts the field of study of the respondents of this survey, and majority of them are from the field of Computer Science and IT, where others are from applied sciences and medical related backgrounds. It could be seen that out of the respondents, 8.77% are first year undergraduates, 30.40% are second year undergraduates, 45.02% are third year undergraduates, 9.35% are fourth year undergraduates from all fields mentioned below. 2.33% of them are 5th year medical faculty undergraduate students and remaining students have just completed their degree and waiting for graduation.

The awareness of ChatGPT among the students were also assessed where we found that 93% of the students know what ChatGPT was where only 4% claimed that they have no idea. We also found that around 3% of the respondents were aware of this platform, yet have not used it. This indicates that ChatGPT has become quite popular among the undergraduates within a short period from its launch and many students have utilized for varying academic purposes. It has been consistently claimed that the accuracy of the ChatGPT was practically low. Thus, to assess the accuracy and reliability of ChatGPT, we were interested to obtain the feedback from its real users. The results showed that nearly 53.21% of the respondents have experienced partially inaccurate answers which raises concerns on the reliability of ChatGPT for academic purposes. It is also worthy of note that 3.05% of respondents have received fully inaccurate responses as well. The frequency of using the ChatGPT was also assessed using this questionnaire. The results were surprising to see that majority have used it even several times in a week as shown in Figure 02. While the assessment on main purpose of using ChatGPT was found to be for completing assignments as given in Figure 03.

In addition to the use of ChatGPT, we were interested in investigating the usage about other alternative LLMs available similar to ChatGPT and their awareness about them. The results depicted in Figure 04 reveals that they were aware of Google Bard, Microsoft Bing AI as well. In addition, it is noteworthy that 56.72% of the surveyed students expressed a preference for further development of Large Language Models

(LLMs) and the inclusion of more comprehensive information, including visual aids and embedded video tutorials within the responses they receive. This inclination toward enhanced LLM capabilities was met with a contrasting viewpoint,

as 21.05% of the respondents disagreed with the concept, asserting that they would prefer a more research-oriented and self-driven approach to learning, rather than relying on a single-click solution.

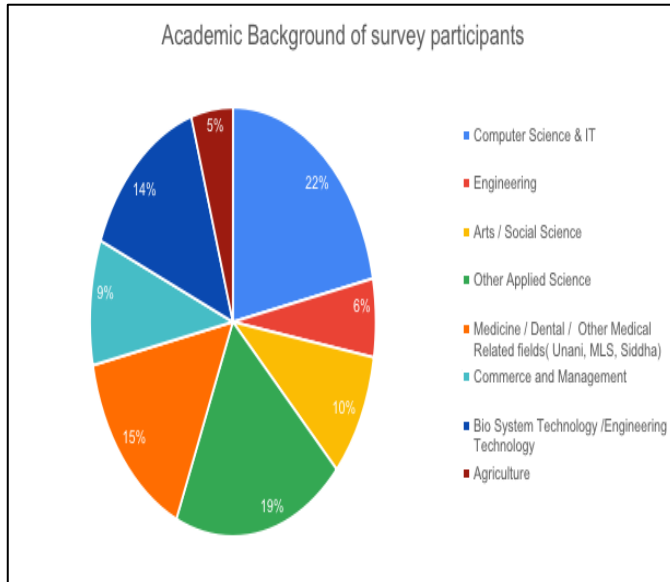


Figure 02: Academic Background of Participants

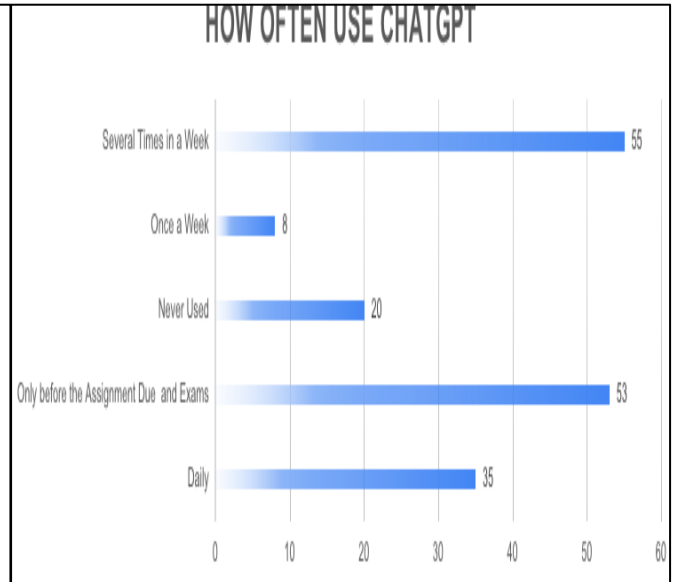


Figure 02: Frequency of using ChatGPT

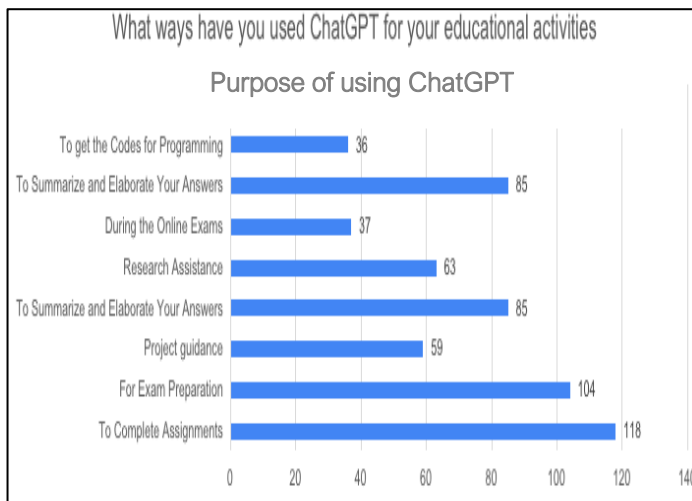


Figure 01: Purpose of using ChatGPT

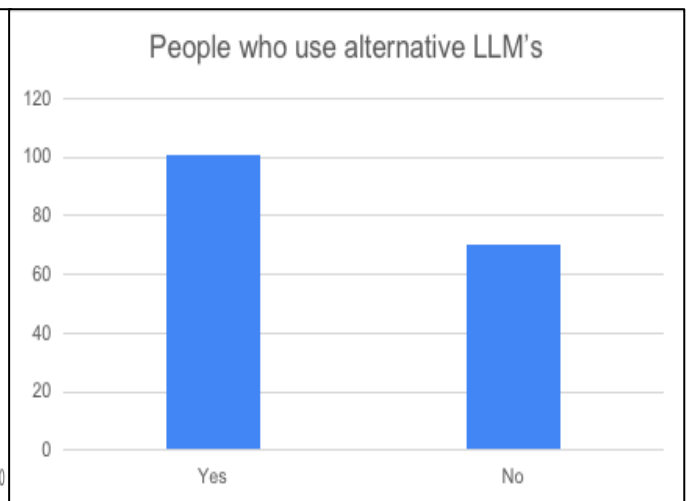


Figure 04: Usage of alternative LLMs

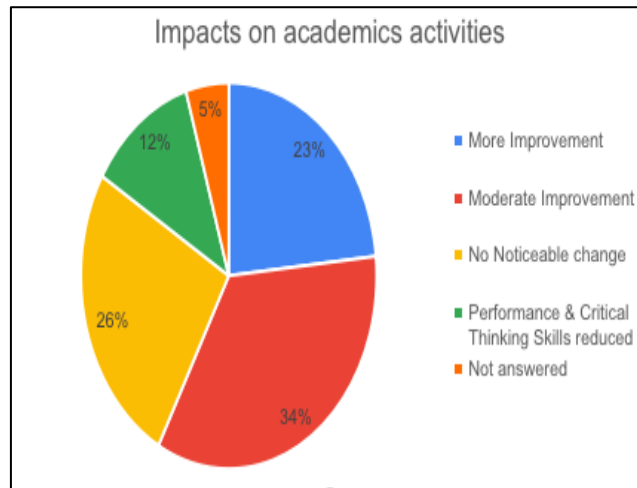


Figure 05: Impact on Academic Activities

While concerns have been raised regarding the potential impact of LLMs on students' critical thinking abilities, it remains significant that the majority of students are inclined towards the convenience offered by these technologies. This inclination suggests the possibility of a future generation that may rely more heavily on technology for knowledge acquisition, potentially at the expense of fostering innovation and critical thinking skills.

The impact of using ChatGPT for academic works was also assessed by querying on the various improvements, critical thinking skills etc. where majority of respondents observe moderate improvement while it was surprising to witness that around 12% of the respondents claimed that their critical thinking and performance gradually deteriorated upon using ChatGPT for their academic purposes (Figure 05). This also raises concerns where the use of ChatGPT for every need of the academic activities require a serious caution and we advise the limited use of this platform. Finally, the overall satisfaction of using ChatGPT was assessed where more than three fourth of the respondents have rated 3 or above which indicates that the acceptance of ChatGPT among the undergraduate students is quite high.

IV. CONCLUSION

The arrival of Large Language Models (LLMs) like ChatGPT into the world of learning and research has resulted in a revolutionary period marked by improved accessibility and support for a wide range of undergraduates from different field of studies. These LLMs, have the capacity to

engage in complex discourse and generate text that simulates human speech, have proven essential in tackling a variety of educational tasks, including responding to inquiries, assisting with research, and enabling teaching and learning. To be clear, LLMs do have several limitations in addition to their exceptional talents. They still provide several inaccurate results and provide the students with wrong understandings incase if they fail to analyze the results that they obtained. These include bias susceptibility, difficulty with complicated reasoning, and a constrained capacity for processing visual data. The ethical considerations of using LLMs, since our survey proves that majority of the students rely on ChatGPT's assistance with their assignments doubts the originality along with the worries about bias elimination, privacy protection, accountability, and wider societal effects, call for thorough investigation. Despite these obstacles, our data indicates a positive future for LLMs in undergraduate education, reflecting changing student expectations. While adhering to strict ethical guidelines, educational institutions and developers must be flexible in developing LLMs to meet these changing demands. However, we would also like to highlight the negative impact that ChatGPT has on the deterioration of critical thinking and certain other skills along with its questionable reliability that require caution for the users. In conclusion, while acknowledging the difficulties and ethical nuances inherent in LLM deployment, we argue that LLMs like ChatGPT hold the potential to significantly improve undergraduates' educational and research experiences by providing them with potent tools

for knowledge acquisition and exploration in the rapidly changing digital landscape of academia.

V. LIMITATIONS AND FUTURE WORKS

It is crucial to point out that the research undertaken in this study used ChatGPT as its base, which is now undergoing active development. During our survey conducted with in a very short period of time we have only able to get the response from only 171 undergraduates which is not much sufficient when we consider about the overall count of the undergraduates in Sri Lankan state universities. We believe that more amazing results can be derived if we focus on some more respondents. Meanwhile developing a framework which can suggest some better ways to utilize these LLMs for teaching and learning could be more beneficial since there is more thirst among the undergraduates regarding the advancement of these chatbots. Therefore, we could focus more on creating an effective framework as our future scope which will aid in analyzing the accuracy of response receive from these chatbots.

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