Business Excellence and Management
Volume 14 Special Issue 4 / October 2024

UNDERGRADUATES' CHATGPT DEPENDENCE AS AN EFFECTIVE TOOL FOR LEARNING IN SOUTH AFRICA

Nobuhle Elizabeth NDABA
Mangosuthu University of Technology, Durban, South Africa
NdabaN@mut.ac.za

Sandiso NGCOBO
Mangosuthu University of Technology, Durban, South Africa
Sandiso@mut.ac.za

Abstract
Chat Generative Pre-Trained Transformer (ChatGPT) has since late 2022 taken the world by storm because of its ability to facilitate many academic and professional activities. There is however a gap in research on the use frequency and dependence on this tool as an effective means of learning by students from linguistically and socio-economically challenged backgrounds in developing countries, such as South Africa. The quantitative study results presented in this article involved 50 first-year students who completed an online structured questionnaire using the ChatGPT tool via mobile devices. The findings revealed that many of the respondents were familiar with the tool which they used in all their modules. The respondents expressed trust in the tool that they often used. The overall evaluation of the ChatGPT tool showed that, with some control, Artificial Intelligent technologies have a significant potential to be used as a learning agent to increase business communication and academic literacy skills among students from a disadvantaged backgrounds.
Keywords: Artificial intelligence, Dependence, Productivity, Socio-economic background, Learning.
DOI: https://doi.org/10.24818/beman/2024.S.I.4-01

1. INTRODUCTION

The introduction of Artificial Intelligence (AI) chatbots, such as Chat Generative Pre-Trained Transformer (ChatGPT), marks the dawn of Fifth Industrial Revolution (5IR). The 5IR, similar to Fourth Industrial Revolution (4IR), will share common traits like the progression of AI, Internet of Things, quantum computing and big data which display an increase in human intelligence (Ausat, 2022; Saienko & Lavrysh, 2020). According to Almendingen et al. (2021) the variation between 4IR and 5IR is that the latter promotes a more diversified learning correlation among 4IR components and human intellect. Mhlanga (2021) predicted that in 5IR, students will no longer be afraid of robots replacing their lecturers or tutors like in 4IR, instead humans will team up with robots to create a better world. The above statements are

supported by Cooper (2023) that robots will then be referred to as cobots; whereby two parties will work together to integrate human intellect and cobots' innovativeness will assist to resolve complex missions, thus providing Higher Education Institutions (HEIs) with opportunities to showcase their readiness to embrace digital transformation. For example, Apple has Siri and Microsoft has Cortana; these virtual assistants' responsibility is to engage with users by reminding them, scheduling meetings, and checking calendar for appointments. These virtual assistants are multilingual as they come in different languages.

ChatGPT is an AI chatbot created by Open AI and was released in November 2022 reigniting a public discourse across different research fields (Baidoo & Owusu, 2023; Dwivedi et al., 2023). ChatGPT has an ability to hold a dialogue similar to a human, it can offer advice, and can sympathize with the user (Zhuo et al., 2023; Luan et al., 2023). To students ChatGPT has come as the 'saviour' of most of their academic struggles at the right time of digital transformation in Higher Education. Mhlanga (2023) disclosed that since ChatGPT was launched, it has been impressively rated higher than other AI counterparts. ChatGPT is applauded for exceeding over 1 million users global downloads after a week it was launched, making it the most rapidly downloaded application in history (Hassani & Silva, 2023; Baidoo & Owusu, 2023). Cordero et al. (2022) explain that ChatGPT exert multiple AI technologies, from machine learning that optimize feedback over time to Natural Language Processing (NLP) and Natural Language Understanding (NLU) which carefully decode user questions and replica them to the sender. These features make ChatGPT appropriate for summarizing, formatting data and making suggestions based on provided information. ChatGPT can further draft essays, blogs, translate text, draft a business plan, CV, write a story or recommend lyrics for music. ChatGPT is good at mimicking human conversation and can translate to other languages (Bishop, 2023).

However, ChatGPT cannot generate images or audio or video and it cannot access user computer files. For students, Zhuo et al. (2023) recommend that the use of ChatGPT should be minimal and under caution as the tool cannot be likened to a real lecturer for lessons. Moreover, the biggest challenge with scientific texts obtained from AI is lack of clarity on how it should be presented and cited (Özcan & Polat, 2023). There are also issues on the moral and behavioural implications associated with the general use of ChatGPT in the academic arena (Bishop, 2023; Khan et al., 2021). ChatGPT has been associated with stereotypes and biases associated with gender, race, and other kinds of social biases.

Despite cautionary words about ChatGPT, overall, it has immense productivity benefits at educational level and in the workplace. In education, students can utilise ideas generated by ChatGPT to guide them in conducting different types of writing tasks they do for assessment purposes (Rasul et al., 2023). Similarly, a study conducted by Jo and Park (2023) among 351 workers from various industries found that ChatGPT provided workers with new knowledge and information support which enabled them to execute their duties

Business Excellence and Management
Volume 14 Special Issue 4 / October 2024

efficiently. This in turn shaped the workers' perceptions and intentions to further use ChatGPT (Jo & Park, 2023). It is for these reasons important for learners to have access to technology to be able to develop their own knowledge and communicate it with others in the global village (Marin & Prioteasa, 2020). It however remains to be investigated on the extent in which AI tools have reached and are productively utilised by students from developing countries, such as South Africa (Ngcobo, 2014; Richardson, 2011). ChatGPT is of interest here because of its potential to contribute to English second language development in a country where English is an ex-colonial language that is used as the main medium of instruction and business communication (Barrot, 2023; Kim, Shim & Shim, 2023; Kohnke, Moorhouse & Zou, 2023). During the advent of Covid-19 educational institutions across the globe were forced to adopt technology to facilitate teaching and learning from home (Shettar et al., 2021). In many disadvantaged communities the use of technology in education posed immense challenges due to lack of digital devises and network connectivity (Beaunoyer et al., 2020; Faturoti, 2022; James, 2021). This transition to technology exposed the digital divide or gaps in use, distribution and access to technology in developing sub-Saharan countries (Makumane et al., 2023). Post COVID-19 it is important to establish if the circumstances and interest in technology have improved in developing countries. A previous quantitative study by Marin & Prioteasa (2020) used an online questionnaire to gauge the teachers' views on the availability of digital tools in Romanian schools and the impact their use had on pedagogical practices. The contribution of the current study is that it investigates the views of students in a university context found in South Africa. Students are important stakeholders in educational management whose perspectives influence the quality of education they receive as consumers (Khadija, 2022; Purwanto et al., 2021; Sarva et al., 2023).

2. LITERATURE REVIEW

According to Cordero et al. (2022) excessive dependence to online tools including ChatGPT for learning has proven to have detrimental effects on students' thought processes. ChatGPT as a widely utilised generative tool has undesirable outcomes on students' learning. When providing a response, ChatGPT provides detailed feedback without acknowledging the sources where it received the information from, by doing so it violates academic integrity by promoting plagiarism (Mhlanga, 2023). Further, the application provides similar responses across all users who are asking it similar questions. Students can ask ChatGPT to provide examples if they feel as if a concept was not clearly explained. The diagram below is an example of a question "how to lose weight" with a follow up "give me example", and in both questions ChatGPT provided exceptional responses.

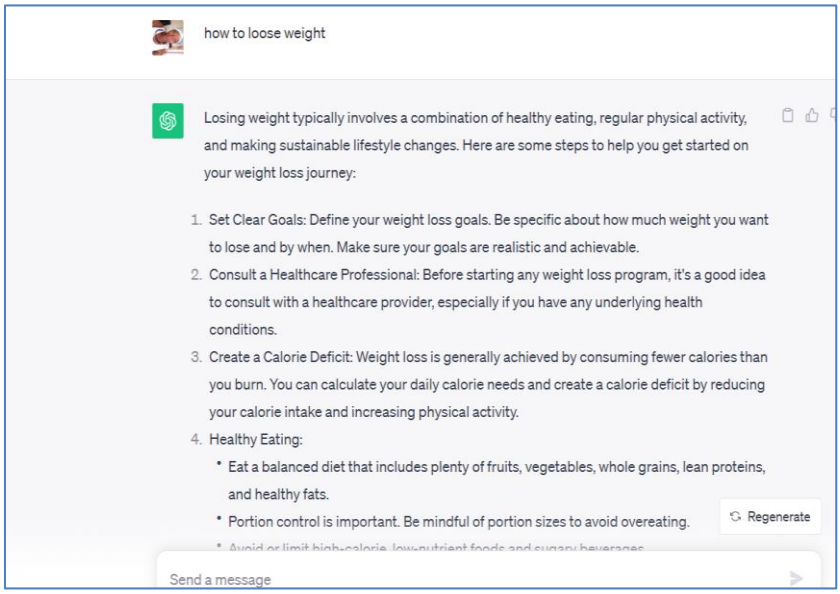

FIGURE 1. CHATGPT RESPONSE TO THE QUESTION "HOW TO LOSE WEIGHT"
Source: ChatGPT

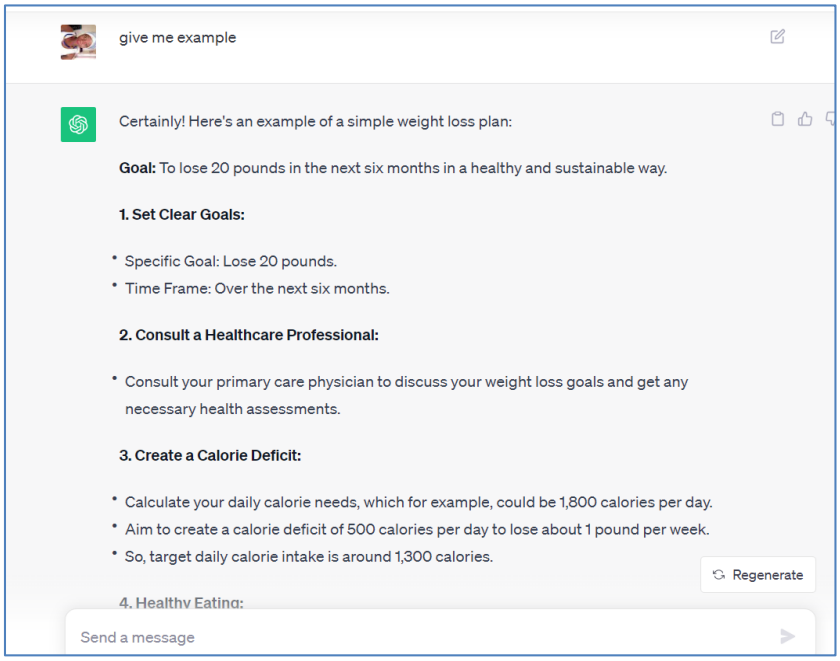

FIGURE 2. CHATGPT RESPONSE TO THE QUESTION "GIVE ME EXAMPLE"
Source: ChatGPT

This type of learning is not encouraged in the classroom, as it makes students passive by undermining critical thinking skills, problem solving skills and active learning (Hassani & Silva, 2023). Students therefore need to be cautioned about the dangers associated with uncontrolled use of ChatGPT. Alara and Al-

Business Excellence and Management
Volume 14 Special Issue 4 / October 2024

Rawashdeh (2021) present that ChatGPT jeopardizes the authenticity, quality, validity and fairness of online assessment. When students are allowed to conduct tests and examinations on their own, it is difficult to supervise and monitor the students' surroundings. Hence, there is a high probability of multiple device access, and online consultation to applications like ChatGPT, streaming on videos or referring to other online material for answers. The use of plagiarism detector tools such as Turnitin is vital during the heightened digital communication use era. It has been reported that Turnitin is able to detect ChatGPT assisted student work, this comes as a relief to lecturers and alleviates some of the quality concerns of ChatGPT and assessment.

The higher education system is currently enrolled with a cohort of students called Generation Z who were born from 1995 to 2012, also referred to as digital natives, Gen Zers, zoomers, or post-millennials (DHET, 2023). As stated by Szymkowiak et al. (2021) Gen Z students have better adoption of 4IR technologies, like robots and possess no anxiety in digital transformation. According to Hassani and Silva (2023) Gen Z students are the first ever generation to be born with uninterrupted access to digital communication channels and digital learning platforms such as ChatGPT and other social media channels, resulting in a digital-first and augmented reality. Therefore, Annuar et al. (2021) cautions that Gen Z students' instructional experiences ought to be technology-driven and relevant to the digital world. This cohort of students appreciate practical, active hands-on learning experiences that integrate technology and prepare them for the future (Szymkowiak et al., 2021). Gen Z students who were born and grew up after the advent of the internet and during the rise of smartphones, can be referred to as the genuine digital native generation. This cohort of students, however, are faced with multiple behavioural problems such as apprehensiveness caused by strains such as global unrest, financial crises, and educational interruptions due to the COVID-19 pandemic (Ausat, 2022). It is notable that these students do not know life without cell phones, televisions, internet and applications and have grown up during a time of widespread access to technology, the way they depend and react with the internet is not common from other generations.

Due to high usage in digital channels, Gen Z students are conventional to sudden and persistent internet connection. They tend to approve incisive messages and visual content over worded messages (Ausat, 2022; Tlili et al., 2023; Hassani and Silva, 2023), which has positive or negative inference on how lecturers teach them. Therefore, lecturers should be conscious of these preferences when teaching and assessing Gen Z students and should consider using online channels, such as e-learning tools to capture their attention. Although Gen Z students are celebrated for their fluency in communicating through smart devices, they experience challenges in face-to-face interactions and prefer small group learning to allow and maintain personalized pace (Rawashdeh, 2021). This desire towards intrapersonal learning is distinct from Generation X interpersonal approach (Rawashdeh, 2021), which highlights partnership and association.

This approach relates with findings by Khan et al. (2021), which noted that university students born after 1992 had a significantly different preference for group work compared to students born between 1982-1992. This implies that, although Gen Z students may prefer intrapersonal learning, they are willing to engage in chat and dialogue with their peers and can be a team only when necessary through digital platforms. Annuar et al. (2021) emphasize that Gen Z students are proving to be independent learners, relying on technology and smartphones to solve problems for them. This behaviour of Gen Z students has implications to the lecturers and calls for the redesigning of curriculum, a change of delivery mode which will aim at engaging and supporting this generation. Additionally, Gen Z have an attention and focus span of 10 seconds on average and expect immediate feedback (Cooper, 2023; Ge & Lai, 2023; Khan et al., 2021). Studies by Cooper (2023) have suggested that the use of quizzes, role playing, and gamification can enhance Gen Z participation during the learning time. Gen Z students prefer augmented learning approaches that incorporate technology, images, music and audio instead of text over traditional textbook-based learning as these are more fascinating and interactive (Tlili et al., 2023). Uninterrupted access to digital technologies for learning is an important ingredient that lecturers of Gen Z students should not underrate.

Overall, Gen Z students are distinguished by their entrepreneurial skills and an attitude to embrace change swiftly. They are optimistic to experience future technologies (Shah, 2019; Lin & Li, 2023), with an immediate satisfaction and superficial augmented relationships. They seek possibilities to make learning easier through digital technologies and expect their digital experiences to prepare them for success in the workforce (Ausat, 2022; Tlili et al., 2023; Hassani & Silva, 2023).

3. METHODOLOGY

An online survey was conducted among 50 first-year students registered for the English communication skills module. The study took place in the second semester of the 2023 academic year when new students were well-settled in the new university environment. Data were collected and analysed through excel. The purpose of the survey was to examine ChatGPT frequency and dependence among the respondents. The survey included five questions, which were the respondents' birth years, whether they have used ChatGPT in their modules, whether they trust ChatGPT answers, how often they use the application, and how satisfied they are with this support.

The survey questions were deliberately kept to a minimum to encourage maximum participation and completion rate of the questionnaire. Data were collected in class during the lecture period of the first author. However, the respondents were not forced to participate in the study. Rather, an explanation was provided that the collected data would be useful in understanding their technology usage and this would

Business Excellence and Management
Volume 14 Special Issue 4 / October 2024

impact teaching and learning. Students were assured that their names would neither be required in completing the questionnaire nor be revealed when data are analysed. It was made clear that the task required a smartphone or a digital device that was able to connect to the university Wi-Fi. Sharing of devices was encouraged in a effort to increase participation in the study and to avoid making students without smartphones feeling left out of the activity. The link to the questionnaire was posted on the class WhatsApp group by the class representative who received it from the researcher.

4. FINDINGS AND DISCUSSION

In a class of 69 students that were present on the day of data collection, only 50 were able to respond within the stipulated time allocated for the administration of the questionnaire. The response rate was considered positive for the study. Yet, the few that did not participate were taken as an indication of the number of students who would, because of their disadvantaged socio-economic background, not be able to afford smartphones. It should be acknowledged that the government of South Africa provides financial support to students from disadvantaged backgrounds. This assistance, known as National Student Financial Aid Scheme (NSFAS) since 1999, has proven to be positive for access and success in higher education and the increase of skilled citizens (de Villiers, 2023; Mokgotho, Njoko & Burman, 2023; Pillay, Bhorat & Asmal, 2021). At the same time, there are cases of students who fail and eventually dropout of higher education partly due to underlying socioeconomic hardships and inadequate learning resources (Branson & Whitelaw, 2023; Mabuza, 2020). It is unclear if dropouts can be attributed to cash payments made to students' private banking accounts that they are expected to utilise towards purchasing study materials and technological devices. Media reports suggest that the purchase of books and technological devises has since declined. The suspicion is that students either send money to their struggling families or/and use it for their personal needs (Shange, 2019). Disadvantaged socio-economic backgrounds expose students to be victims of the digital divide or gaps in use, distribution and access to technology that have been observed in sub-Saharan countries (Makumane et al., 2023).

4.1 Digital natives

The first question required the respondents to indicate their age range in the provided two options. The first option was between 1990 and 1994 and the second one was 1995 and 2012. While most respondents would have completed their schooling in the previous year, it is not uncommon for many young people to delay their university studies due to financial constraints. Hence, the options were designed to cater for all possibilities. The results are indicated in Figure 3.

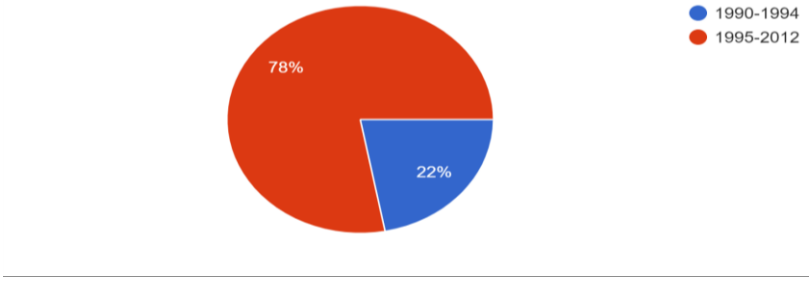

FIGURE 3. STUDENTS' YEAR OF BIRTH
Source: Excel

Figure 3 indicates the approximate birth year for all the respondents. The overall birth year ratio of respondents is approximately 1:3 (22%: 78%). That is, the majority of students (78%) who participated in the study were born between 1995 and 2012 whilst 22% were born between 1990 and 1994. These results attest with the DHET (2023) demographics which indicate that students born between 1995 and 2000 currently form the main cohort of undergraduate programmes. This group would for this reason qualify to be called digital natives, Gen Zers, zoomers, or post-millennials because of their better exposure to technological communication tools (Hassani & Silva 2023; Szymkowiak et al. 2021). As a result, the digital natives are expected to be drawn to technological-driven learning experiences (Szymkowiak et al., 2021).

4.2 Technologically driven

As a follow-up to the previous question, the second question required the respondents to indicate whether they have utilised ChatGPT. The options were a simple Yes or No. Figure 4 displays the results.

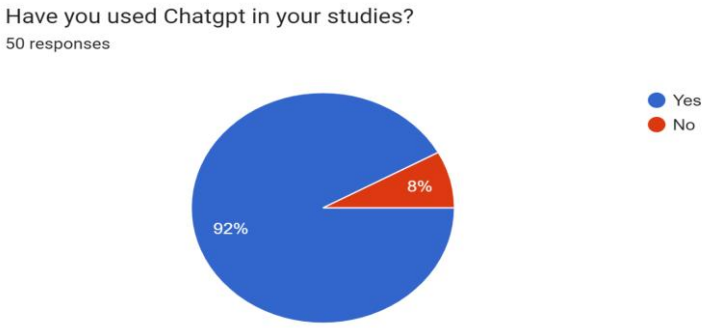

FIGURE 4. CHATGPT USE
Source: Excel

It was not surprising to find that most respondents were already using ChatGPT within their first year of undergraduate studies. Figure 4 shows that there is a high usage of ChatGPT for learning among students. As many as 92% of students indicated Yes and only 8% indicated No.

Business Excellence and Management
Volume 14 Special Issue 4 / October 2024

The results correlate with the previous question's findings which indicated that the respondents were a large part of digital natives. This generation has been predicted not to be afraid of robots replacing their lecturers and collaborating with robots, as cobots, to create a better world (Cooper, 2023; Mhlanga, 2021). The results show the extent to which AI tools have reached and are utilised by students from developing countries (Ngcobo, 2014; Richardson, 2011). This finding concurs with a previous study which found that Covid-19 had a positive impact on the widespread use of technology in education and society (Ausat, 2022).

4.3 Impact on pedagogical practices

It was equally important to establish if the students found the utilisation of ChatGPT efficient enough to contribute to their productivity in education. Hence, the next question inquired on this important factor of the study. The results are displayed in Figure 5.

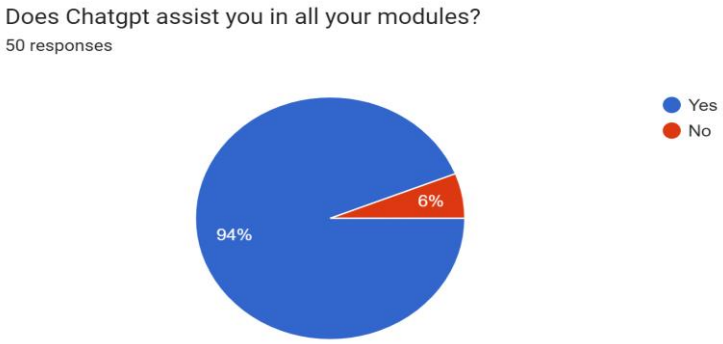

FIGURE 5. CHATGPT IMPACT ON LEARNING
Source: Excel

In response to the question 'Does Chatgpt assist you in all your modules?', 94% of students agreed with the statement and only 6% of students disagreed. These figures show that many students have opted to use digital learning materials and platforms for additional learning support. The advantage of this is that ChatGPT acts as a useful tool to improve language skills including writing and reading skills which are lacking among Gen Z students due to increased screen time, gamification, and music streaming (Cooper, 2023). ChatGPT should therefore be encouraged because of its potential to contribute to English second language skills development (Barrot, 2023; Kim, Shim & Shim, 2023; Kohnke, Moorhouse & Zou, 2023).

4.4 ChatGPT dependence

Many issues have been raised about the credibility of information generated by ChatGPT. Hence, scholars such as Zhuo et al. (2023) have recommended that there should be minimal and cautionary utilisation of AI tools because they cannot replace real lecturers. Scientific texts obtained from AI raise moral concerns as

they tend to lack clarity on how they should be presented and cited (Bishop, 2023; Khan et al., 2021; Özcan & Polat, 2023). It was for this reason important to establish if students were aware of these issues which would be gauged by their level of trust and dependence on AIs. Table 1 displays the results.

TABLE 1. STUDENTS TRUST IN CHATGPT TOOLS

Do you trust ChatGPT?		
	Frequency	Percent
Yes	45	95
No	5	5
Total	50	100

Source: Authors

Table 1 indicates frequency and percentage of students who trust ChatGPT. As many as 95% of respondents indicated their dependence on using the AI tools for the learning whereas only 5% of students do not trust ChatGPT. These results indicate that although artificial intelligence tools cannot replace humans, AI tools are considered more accessible and reliable than real teachers. On the one hand, the results are consistent with the positive outcomes on the previous question in which the respondents indicated that they found AI tools supportive of productivity in education. Furthermore, the results correlate with those by Jo and Park (2023) among workers who indicated that ChatGPT provided workers with new knowledge and information support to execute their duties productively. As a result, the workers' perceptions and intentions to further use ChatGPT were increased which suggested their dependence on the AI tools (Jo & Park, 2023). On the other hand, the respondents' high trust and dependence on AI tools is concerning because it can lead to students being lazy to think on their own and could contribute to students committing acts of plagiarism (Cordero et al. 2022; Mhlanga, 2023).

4.5 ChatGPT usage frequency

The last question sought to establish the frequency of respondents' usage of AI tools. The question provided the respondents with four options which included 'Never'. The results are displayed in Figure 6.

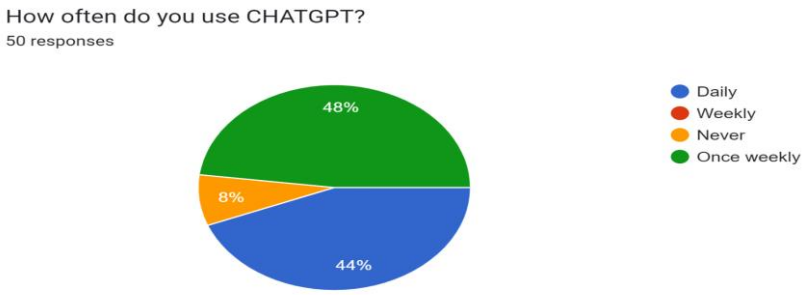

FIGURE 6. CHATGPT USAGE FREQUENCY
Source: Excel

Business Excellence and Management
Volume 14 Special Issue 4 / October 2024

Figure 6 shows that there is high use of the ChatGPT tool among students. In this instance, 48% of students are using the tool once a week whilst 44% are using the tool daily. A mere 8% of respondents never used ChatGPT for their learning. On the one hand, the high frequency usage is concerning against the criticism that has been levelled against AI tools (Cordero et al. 2022; Mhlanga, 2023). On the other hand, they augur well for independent learning that could be facilitated in collaboration and discussions among students and lectures to gain a better understanding on a subject matter.

5. CONCLUSION

The objectives of the study were realised as the findings show that students in challenged linguistic and socio-economic backgrounds have also taken interest in ChatGPT. This brings hope that they can utilise the tool to improve their English communication skills and other business management skills that will be required when they enter the world of work. Undergraduate students find AI tools useful in facilitating their learning and this has led to students trusting these tools which they now use frequently. It is however worth acknowledging that the study was conducted with a small sample of students. For this reason, the current findings might be deemed to be not generalisable to the entire student population in the institution and in the country. Yet, the authors wish to argue that to some extent the results can be generalised as representative of what is happening among Gen Zs. The researchers used ChatGPT version 3.5 which is available freely to all subscribers but has limited capabilities compared to other versions like ChatGPT version 4 which has standout features like context window that can improve users' input. In future, a similar study can be conducted with the latest version of the application for improved results.

REFERENCES

Alara, M. & Al-Rawashdeh, B. (2021). Advantages and disadvantages of using e-learning in university education: Analyzing students' perspectives. Electronic Journal of E-learning, 19(3): 107-117. https://doi.org/10.34190/ejel.19.3.2168.

Almendingen, K., Morseth, M.S., Gjølstad, E. & Brevik, A. (2021). Student's experiences with online teaching following COVID-19 lockdown: A mixed methods explorative study. PloS One, 16(8): e0250378. https://doi.org/10.1371/journal.pone.0250378.

Annuar, N., Sabri, M.D. & Johan, M.R.M. (2021). Empowering self-directed learning through technology, organization and personal support in open and distance learning: A conceptual review. Turkish Journal of Physiotherapy and Rehabilitation, 32(3): 23303-23313. http://www.turkjphysiotherrehabil.org/.

Ausat, A. (2022). Positive impact of the Covid-19 pandemic on the world of education. Jurnal Pendidikan, 23(2): 107–117. https://doi.org/10.33830/JP.V23I2.3048.2022.

Baidoo, D. & Owusu, L. (2023). Education in the Era of Generative Artificial Intelligence (AI): Understanding the Potential Benefits of ChatGPT in Promoting Teaching and Learning. Available at SSRN 4337484.

Barrot, J.S. (2023). Using ChatGPT for second language writing: Pitfalls and potentials. Assessing Writing, 57: 100745.

Beaunoyer, E., Dupéré, S. & Guitton, M.J. (2020). COVID-19 and digital inequalities: Reciprocal impacts and mitigation strategies. Computers in Human Behavior, 111: 106424. https://doi.org/10.1016/j.chb.2020.106424.

Bishop, L. (2023). A computer wrote this paper: What ChatGPT means for education, research, and writing. Research and Writing.

Branson, N. & Whitelaw, E. (2023). South African student retention during 2020: Evidence from system-wide higher education institutional data. South African Journal of Economics. https://doi.org/10.1111/saje.12361.

Cooper, G. (2023). Examining science education in ChatGPT: An exploratory study of Generative Artificial. Intelligence Journal of Science Education and Technology, 3: 1. https://doi.org/10.1007/s10956-023-10039-y.

Cordero, J., Barba-Guaman, L. & Guamán, F. (2022). Use of chatbots for customer service in MSMEs. Applied Computing and Informatics, (ahead-of-print).

de Villiers, P. (2023). Perspective chapter: The role NSFAS has played to facilitate poor students in South Africa. https://doi.org/10.5772/intechopen.109664.

Department of Higher Education and Training (DHET). (2023). Higher Education Management Information Systems (HEMIS) data. Pretoria: DHET.

Dwivedi, Y.K., Kshetri, N., Hughes, L., Slade, E.L., Jeyaraj, A., Kar, A.K. & Wright, R. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. International Journal of Information Management, 71: 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642.

Faturoti, B. (2022). Online learning during COVID19 and beyond: a human right based approach to internet access in Africa. International Review of Law, Computers & Technology, 36(1): 68-90. https://doi.org/10.1080/13600869.2022.2030027.

Ge, J. & Lai, J.C. (2023). Artificial intelligence-based text generators in hepatology: ChatGPT is just the beginning. Hepatology Communications, 7(4): 1. https://doi.org/10.1097/HC9.0000000000000097.

Hassani, H. & Silva, E. (2023). The role of ChatGPT in data science: How AI-Assisted conversational interfaces are revolutionizing the field. Big Data and Cognitive Computing, 7(2): 62. https://doi.org/10.3390/bdcc7020062.

James, J. (2021). Confronting the scarcity of digital skills among the poor in developing countries. Development Policy Review, 39(2): 324-339. https://doi.org/10.1111/dpr.12479.

Jiang, H., Cheng, Y., Yang, J. & Gao, S. (2022). AI-powered chatbot communication with customers: Dialogic interactions, satisfaction, engagement, and customer behavior. Computers in Human Behavior, 134: 107329. https://doi.org/10.1016/j.chb.2022.107329.

Jo, H. & Park, D. H. (2023). AI in the workplace: Examining the effects of ChatGPT on information support and knowledge acquisition. International Journal of Human–Computer Interaction, 1-16. https://doi.org/10.1080/10447318.2023.2278283.

Khadija, H. (2022). Stakeholders in education. Annals of the University of Oradea, Economic Science Series, 31(1). https://search.ebscohost.com/.

Khan, N.A., Khan, A.N. & Moin, M.F. (2021). Self-regulation and social media addiction: A multi-wave data analysis in China. Technology in Society, 64: 101527. https://doi.org/10.1016/j.techsoc.2021.101527.

Kim, S., Shim, J. & Shim, J. (2023). A study on the utilization of OpenAI ChatGPT as a second language learning Tool. Journal of Multimedia Information System, 10(1): 79-88. https://doi.org/10.33851/JMIS.2023.10.1.79.

Kimberling, E. (2021). What is the best digital transformation methodology? Retrieved from: https://www.thirdstage-consulting.com/what-is-the-best-digital-transformation-methodology/.

Kohnke, L., Moorhouse, B.L. & Zou, D. (2023). ChatGPT for language teaching and learning. RELC Journal, 00336882231162868. https://doi.org/10.1177/00336882231162868.

Luan, L., Lin, X. & Li, W. (2023). Exploring the cognitive dynamics of Artificial Intelligence in the Post-COVID-19 and learning 3.0 Era: A Case Study of ChatGPT. arXiv preprint. https://doi.org/10.48550/arXiv.2302.04818.

Mabuza, N.H. (2020). Dropout causes of students funded by the national student financial aid scheme in South African universities. Doctoral degree. University of South Africa, Pretoria. https://core.ac.uk/download/pdf/339159646.pdf.

Madida, M.S., Naidoo, G.M. & Rugbeer, H. (2019). Barriers to effective digital teaching in rural schools. Gender and Behaviour, 17(4). https://hdl.handle.net/10520/EJC-1b247c29b8.

Makumane, M., Mataka, T.W., Sengai, W. & Ngcobo, S. (2023). Neutralising the digital divide: is blended learning a viable solution?. International Journal of Research in Business and Social Science (2147- 4478), 12(7): 511–522. https://doi.org/10.20525/ijrbs.v12i7.2740.

Marin, A.A. & Prioteasa, A.L. (2020). The impact of using information technology and communication in schools in Romania. Business Excellence and Management, 10(2): 97-108. https://doi.org/10.24818/beman/2020.10.2-07.

Mhlanga, D. (2021). The Fourth Industrial Revolution and COVID-19 Pandemic in South Africa: The Opportunities and Challenges of Introducing Blended Learning in Education. Journal of African Education, 2(2): 15-42. https://doi.org/10.31920/2633-2930/2021/v2n2a1.

Mhlanga, D. (2023). Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. Education. https://dx.doi.org/10.2139/ssrn.4354422.

Mishra, L., Gupta, T. & Shree, A. (2020). Online teaching-learning in higher education during the lockdown period of the COVID-19 pandemic. International Journal of Educational Research Open, 1:100012.

Mokgotho, M.G., Njoko, M.B. & Burman, C.J. (2023). Assessing the utility of the national student financial aid scheme towards skills development: A case of a rural university in South Africa. South African Journal of Higher Education, 37(6): 76-91. https://doi.org/10.20853/37-6-5952.

Ngcobo, S. (2014). Students' perceptions on the use of technology in language teaching. Journal of Education and Vocational Research. 5, 3 (Sep. 2014): pp. 94-100. https://doi.org/10.22610/jevr.v5i3.157.

Özcan, A. & Polat, S. (2023). Artificial Intelligence and Chat Bots in academic research. Journal of Research in Social Sciences and Language, 3(1): 81-90. https://www.jssal.com/index.php/jssal/article/view/111.

Pillay, N., Bhorat, H., Asmal, Z. (2021). Higher education outcomes in South Africa: The role of the National Student Financial Aid Scheme. In: Pearson Jr., W., Reddy, V. (eds) Social Justice and Education in the 21st Century. Diversity and Inclusion Research. Springer, Cham. https://doi.org/10.1007/978-3-030-65417-7_10.

Purwanto, E.S., Patoni, A. & Junaris, I. (2021). Implementation and supervision of stakeholders-based education marketing East Java Indonesia. International Journal of Science, Technology & Management, 2(4): 1141-1153. https://doi.org/10.46729/ijstm.v2i4.247.

Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, F., Ladeira, W. J. & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. Journal of Applied Learning and Teaching, 6(1): 41-56. https://doi.org/10.37074/jalt.2023.6.1.29.

Rawashdeh, A., Al Arab, R., Alara, M. & Al-Rawashdeh, B. (2021). Advantages and disadvantages of using e-learning in university education: Analyzing students' perspectives. Electronic Journal of E-learning, 19(3): 107-117. https://doi.org/10.34190/ejel.19.3.2168.

Richardson, J.W. (2011). Challenges of adopting the use of technology in less developed countries: The case of Cambodia. Comparative Education Review, 55(1): 008-029. https://www.journals.uchicago.edu/doi/epdf/10.1086/656430.

Saienko, N. & Lavrysh, Y. (2020). Mobile assisted learning for self-directed learning development at technical university: SWOT analysis. Universal Journal of Educational Research, 8(4): 1466-1474. https://doi.org/10.13189/ujer.2020.080440.

Sarva, E., Lāma, G., Oļesika, A., Daniela, L. & Rubene, Z. (2023). Development of education field student digital competences - Student and stakeholders' perspective. Sustainability, 15(13): 9895. https://doi.org/10.3390/su15139895.

Shah, R.K. (2019). Effective constructivist teaching learning in the classroom. Effective Constructivist Teaching Learning in the Classroom. Shanlax International Journal of Education, 7(4): 1-13. https://ssrn.com/abstract=4004512.

Shange, N. (2019). NSFAS funds not being spent on textbooks, warn book sellers. https://www.timeslive.co.za/news/south-africa/2019-03-07-nsfas-funds-not-being-spent-on-textbooks-warn-book-sellers/.

Shettar, R.M., Lathiwale, M.S.Z. & Kulhalli, M. (2021). Role of ICT in higher education in selected places during COVID-19. Journal of Research in Social Sciences and Language, 1(1): 42-54. http://dx.doi.org/10.20375/0000-000D-FF90-1.

Szymkowiak, A., Melović, B. & Jeganathan, K. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. Technology in Society, 65: 101565. https://doi.org/10.1016/j.techsoc.2021.101565.

Tlili, A., Shehata, B., Adarkwah, M.A., Bozkurt, A., Hickey, D.T., Huang, R. & Agyemang, B. (2023). What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. Smart Learning Environments, 10(1): 15. https://doi.org/10.1186/s40561-023-00237-x.

Zhuo, T.Y., Huang, Y., Chen, C. & Xing, Z. (2023). Exploring AI ethics of ChatGPT: A diagnostic analysis. arXiv preprint arXiv:2301.12867.