

Examining the Use of ChatGPT among University Students

Student Name: Angeline Nicole Akinyi
Student Number: 676855

Supervisor: Dr. Sarah Young

Master Media Studies - Digitalization, Surveillance & Societies
Erasmus School of History, Culture and Communication
Erasmus University Rotterdam

Master's Thesis
June 2024

Word Count: 16,786

ABSTRACT

This study examines the use of ChatGPT among university students, exploring its impacts on academic work and the broader implications for higher education. As artificial intelligence (AI) continues to transform traditional learning methods, understanding how students utilize ChatGPT becomes crucial for educators and institutions. The research employs a qualitative approach, using in-depth interviews with university students who frequently use ChatGPT for academic purposes. The study is guided by five research questions, investigating how students use ChatGPT, its potential challenges and perceived benefits, institutional support needed, and the influence of the Unified Theory of Acceptance and Use of Technology on ChatGPT adoption. The findings revealed several key themes: Academic research and writing, idea generation, guidance and support informed the use of ChatGPT. Impact on creativity and cognitive skills, laziness, stigma, impact on traditional forms of testing, limited and inaccurate information, and prompt challenges informed the challenges associated with ChatGPT use. Efficiency and time saving, personalized learning and feedback, and enhanced productivity informed the perceived benefits of ChatGPT. Awareness and sensitization, training, integration into academic curricula answered the institutional support needed. Finally, the five constructs of UTAUT framework including, performance expectancy, effort expectancy, social influence, facilitating conditions and hedonic motivation highlighted the influence of the theory on ChatGPT adoption. The research concludes that while ChatGPT offers significant benefits for academic work, it also presents challenges that require careful consideration and management by both students and educational institutions. This study also provides valuable recommendations for supporting students in effectively utilizing ChatGPT while maintaining academic integrity and fostering critical thinking skills essential for the future workforce.

KEYWORDS: *ChatGPT, University Students, Artificial intelligence, Academic support, UTAUT framework*

Acknowledgement

I wish to thank the almighty God for giving me good health, strength and insight that saw me through the struggle in the completion of this research.

I am profoundly grateful to my parents Marcel and Carol for their continued support and for providing the resources necessary to see me through my studies. I appreciate my supervisor, Dr. Sarah Young for encouraging me throughout the writing period and supporting me with revisions up until the last minute.

My appreciation also goes to all my respondents who facilitated the practical aspect of my work.

Table of Contents

1. Introduction.....	6
2. Literature Review.....	9
2.1. <i>Artificial Intelligence</i>	9
2.2. <i>ChatGPT</i>	11
2.3. <i>Uses of ChatGPT for Students</i>	13
3. Theoretical Framework.....	16
4. Research Design.....	19
4.1. <i>Justification for the use of Qualitative Interviews</i>	19
4.2. <i>Sampling</i>	21
4.3. <i>Data Collection</i>	22
4.4. <i>Data Analysis</i>	22
4.5. <i>Ethical Considerations</i>	23
4.6. <i>Operationalization</i>	25
4.7. <i>Limitations of the Study</i>	26
4.8. <i>Personal Reflection</i>	27
5. Results.....	29
6. Discussion.....	44
6.1. <i>Key Findings</i>	44
7. Research Findings with UTAUT Constructs.....	48
7.1. <i>Implications of Findings</i>	49
8. Recommendation for Institutions.....	51
8.1. <i>Recommendation for students</i>	53
9. Conclusion.....	54
References.....	56
Appendix A.....	62
Appendix B.....	64
Appendix C.....	67

1. INTRODUCTION

In the rapidly evolving world of today, the pervasive nature of technology has led to transformative changes across various industries including higher education. As we navigate through this digital era, the proliferation of artificial intelligence (AI) continues to transform and redefine traditional systems, presenting new opportunities and challenges. The widespread adoption of artificial intelligence in education has made considerable impacts on administration, instruction, and learning (Chen et al., 2020, p. 75265). It allows students to practice personalized learning, get explanations for complex concepts, proofread their writing, and get further information on topics they are interested in (Ngo, 2023, p.4). However, the evolving prominence of AI technologies in classrooms has not been well received by many. One such emerging technology is the language model known as ChatGPT (Generative Pre-trained Transformer) created by OpenAI, which has drawn a lot of attention. Since its official launch on November 30, 2022, ChatGPT has grown rapidly and has had a great impact in the AI realm of user applications. As of January 2023, ChatGPT is said to have gained 100 million users in just 2 months, demonstrating its influence and widespread acceptance. According to Ngo (2023), its worldwide popularity is due to its impressive ability to generate responses that are well-structured, logical, and informative. As the most popular Natural Language Processing model, ChatGPT has attracted a lot of student users, which stems from its valuable support, useful for assisting in their academic journeys. It can generate human-like responses and has the potential to revolutionize how students engage with learning material, access information, and seek academic support (Lan, 2023, p. 259). Additionally, instructors are secondary beneficiaries of the enhanced teaching and learning effectiveness made possible by ChatGPT, as its timely responses minimize time and effort spent when giving learners feedback (Mukred et al., 2023, p. 307).

In the context of universities where digitalization and technological advancements are on the rise, understanding how students use ChatGPT is important for both educators and policymakers. This is because of the novel set of opportunities and challenges ChatGPT presents in education. On the one hand, it's a one-stop shop that helps student's access information, allowing them to seek answers to academic queries and clarify concepts conveniently.

Additionally, its 24/7 availability and multilingual abilities are convenient for students who have difficulty writing academic papers in English as it is their second or third language. On the other hand, concerns arise regarding the reliability of information provided by ChatGPT, the potential erosion of critical thinking skills, and ethical considerations surrounding data privacy.

Furthermore, academic integrity is also impacted; for instance, academic papers produced by ChatGPT cannot be flagged as plagiarized. This raises concerns about the validity of learning and the fairness of student assessments. The use of this technology poses a threat to traditional forms of assessments, particularly essay assignments (Adeshola & Adepoju, 2023, p. 2).

Despite its challenges, academics have detected a rise in the number of students using ChatGPT for academic tasks. This is corroborated by a survey carried out in January 2023, which reported that over a third of university students were using AI for assessment writing. This has resulted in some universities banning the use of ChatGPT, describing it as a threat and plague to education. However, not all academic perspectives have ruled out ChatGPT; some stakeholders, including instructors, are open to incorporating ChatGPT in their classrooms while pointing out that despite AI containing factual inaccuracies and biases, it can enhance student learning (Sullivan et al., 2023, p. 2). Educators and policymakers should therefore aim to adapt to the new ways of teaching and learning which reflect the new reality of living, working, and studying in today's digitalized world. It is essential for educators, students, and institutions to gain a deeper understanding of the role of ChatGPT in higher education. Tools such as ChatGPT provide a novel opportunity for students to gain critical thinking, learn complex concepts in a simplified language, and improve inclusion for people with communication disabilities. Therefore, universities should teach students how to use ChatGPT and similar AI tools in ways that foster their critical thinking (García-Peñalvo, 2023, p. 3).

Additionally, AI is not only reshaping education but also the labor market, raising concerns about what to teach and how to teach the current generation. With such concerns, students should be equipped with relevant skills and competencies in the fast-changing labor environment. It is important to understand how AI works as it is expected to automate regular tasks while saving costs and time.

This research aims to examine how university students use ChatGPT in their academic work, as well as the potential implications of such usage in academic settings. This process involves analyzing the different ways students use ChatGPT to help them with their assignments, the benefits they get from it, challenges they experience, and the overall influence it has on their learning as well as academic integrity. The study also aims to contribute to the ongoing discourse on the integration of AI tools in education, providing valuable insights that could guide policy-making and the development of best practices for AI use in academic settings. The following research questions will be used to guide the study:

RQ 1: How is ChatGPT used by university students to assist in their academic work?

RQ 2: What are the potential effects of ChatGPT use for students?

RQ 3: What are the perceived benefits of using ChatGPT?

RQ 4: How can institutions support students to utilize ChatGPT?

RQ 5: How does the Unified theory of acceptance and use of technology influence students to use ChatGPT?

Examining the use of ChatGPT among university students holds significant academic and social relevance, particularly in this digital era. The integration of AI technologies such as ChatGPT into academic settings represents a shift in how learning and the acquiring of knowledge occurs, making this research timely and pertinent. This study contributes to the ongoing discussions of how AI can transform traditional teaching and learning methods. This can be explained by examining the different ways students use ChatGPT for tasks like writing assistance, concept clarification, and personalized learning. This research provides insights into the different approaches that can enhance student engagement and learning outcomes. Additionally, the findings of ChatGPT's impact on academic tasks like writing and research, which undermine traditional assessment methods, could assist educators in rethinking evaluation strategies, doing away with tasks that can easily be done using AI and incorporating assessments that require critical and creative thinking.

As AI continues to infiltrate various industries, this study highlights the importance of equipping students with AI literacy and ethical AI use. These are particularly valuable for the future workforce. Furthermore, policy makers

could be instigated to come up with AI policies in education that provide students with a balance of the benefits of AI with concerns over academic integrity, privacy, and data security.

This study is also developed in the following sections: Section 2 contains a review of the literature on AI-based tools in education with a focus on ChatGPT as a learning tool, and Section 3 explains the adopted methodology, with detailed information on the selection of participants, data collection and analysis of data, and the various procedures employed. Section 4 provides the findings obtained, followed by the discussion in Section 5 and the potential implications and significance of the academic use of ChatGPT in Section 6, and finally the conclusion and recommendations for future studies in Section 7.

2. LITERATURE REVIEW

This literature review section will utilize existing studies to examine how university students use ChatGPT to assist in the academic work, and the implications of integrating ChatGPT into higher education settings. The literature will be presented on a topical approach that will cover different aspects of ChatGPT use and its impact in the education sector. This approach is valuable as it captures synthesized insights from multiple disciplines such as AI, Education, and student interaction with ChatGPT. This cross-disciplinary view provides a comprehensive understanding of the use of ChatGPT in higher education as well as its potential impacts. The review comprises the following topics key topics: the role of AI in education, an overview of ChatGPT, the various uses of ChatGPT in educational contexts, and the challenges associated with its integration. This will facilitate a deeper examination of each topic and identify research gaps resulting to refined objectives of the study and contributing to the existing body of knowledge.

2.1 Artificial Intelligence

Artificial intelligence is present everywhere in our daily lives. There are many examples of how AI has permeated into various aspects of human lives, including accessing information over the web, consuming news and entertainment, surveillance systems identifying individuals. As AI advances, it is clear that it has the potential to revolutionize various aspects of society, from the business sector, healthcare to education (Adiguzel et al., 2023, p. 2). The term artificial intelligence was coined in the 1950s, and it was simply explained by John McCarthy as human intelligence exhibited by machines. The rapid technological advancements in today's digitalized era has transitioned AI into a tangible application. Its ability to evaluate large data sets in real-time, conduct autonomous driving, and make recommendations for online purchases, cements the fact that AI is becoming more ingrained in many aspects of society (Helm et al., 2020, p.69). Machine learning, is a subset of artificial intelligence that incorporates learning associated with human intelligence and learning through algorithms. The algorithms train machines to recognize patterns and eventually to make decisions using input and output data. This technology supports ChatGPT's ability to process extensive amount of data and produce

relevant responses. The iterative process of refining algorithms to improve accuracy ensures the AI model becomes highly proficient over time.

Understanding this process is important for recognizing how ChatGPT evolves and adapts to provide more accurate and useful assistance to students. To add onto the basis of machine learning, deep neural networks represent complex versions that employ hierarchical tiers to manage the outputs. The network begins with several inputs that progress to several hidden tiers that respond to different features of the input. This hierarchical approach allows ChatGPT to generate unique text responses by comprehending and responding to complex questions. These inputs allow ChatGPT to have a deeper understanding of the context, explain complex phenomena and generate coherent and contextually relevant texts. This is beneficial in educational settings where precise and relevant information is important (Helm et al., 2020, p.69-70).

Despite the cutting edge technology presented by AI, it remains to be a concern in the educational context especially on whether it will develop or undermine students' intellectual development (Firat, 2023, p. 58). The ability of AI technologies such as ChatGPT to provide precise responses to user inquiries, point to the possibility of academic dishonesty as it can be utilized by students to complete assignments and exams. Moreover, its efficiency might lead university students to rely on it excessively potentially entrusting AI to do their work for them. This is concerning as plagiarism issues are imminent as well as incorrect information and 'fake' references which are downsides of ChatGPT usage (Ngo,2023, p.5). On the other hand, the integration of AI in education could have positive effects on students. Research shows that students are more likely to show interest in learning because of AI enhancement which motivates and increases their engagement significantly. Furthermore, a student's academic performance can improve as a result of utilizing AI technologies. One notable aspect of AI in education lies in personalized learning experience. ChatGPT is able to provide feedback by analyzing students' work, for instance, students who use it to ensure their work is free of grammatical errors and punctuation mistakes. This kind of assistance encourages a student to learn from the feedback provided and promotes self-directed learning. However, there are limitations of ChatGPT in giving responses including giving contradicting information, limited word count, false references and low quality responses that

lack depth and breadth (Ngo, 2023, pp. 6 - 7).

2.2 ChatGPT

ChatGPT was launched in November 2022 by OpenAI, which is an artificial intelligence research laboratory that conducts and promotes AI use for the benefit of humanity (Rudolph et al., 2023, pp. 343-344). This language model is a powerful machine learning software trained to generate texts in natural language inputs. Generative Pre-trained Transformer (GPT) algorithms allow it to produce human-like responses based on given prompts. Additionally, it has the ability to engage in simultaneous conversations on a wide range of topics (Adiguzel et al., 2023, p.3). According to Zhai (2022), its ability to hold conversations in real time, is as a result of reinforced learning from human feedback. While ChatGPT displays impressive capabilities, it is necessary to consider both its strengths and limitations in order to have a comprehensive understanding of its functions.

Benefits of ChatGPT

The many advantages reported when using ChatGPT make it a valuable tool in the field of higher education. To begin with, it thrives in understanding natural language texts, which enables it to interact with users seamlessly and respond to a wide range of common and complex questions accurately (Susnjak, 2022, p.3). Furthermore, its ability to generate human-like responses make it a great addition to chatbots and other interactive platforms, which enhance user engagement and communication (Azaria, 2022, p.5). To add onto that, its efficiency when conducting automated conversations saves time and resources by eliminating the need for manual conversations. Additionally, its speed in generating responses makes it suitable for real-time conversations. This is achieved by providing quick and efficient answers to user questions. ChatGPT has the potential to significantly cut down on costs due to its ability to assist in automation of repetitive tasks reducing the need for human intervention and increasing operational efficiency. For example, students who hire tutors to assist with their papers, and dissertations could use ChatGPT to provide feedback on drafts, outlines, and writing structure reducing the need for one on one consultations that can be costly. Moreover it's potential as a 24/7 personal assistant is significant, offering continuous support for personal needs. (Deng&Lin, 2022, p.82). Lastly, Guo et al. (2022, p.6), reports that the AI

language model is able to provide responses in an organized, logical, and structured manner. It can simplify complex concepts step by step, which makes it easier for users to understand the information. To top it all off, it maintains an objective position on sensitive topics and provides neutral responses on certain issues like politics, not to mention its recognition of its limited information that has not been updated September 2021.

Limitations of ChatGPT

Despite its strengths, ChatGPT has various limitations just like any other emerging technology. According to Azaria (2022, p.6), one primary challenge is its inability to fully understand different contexts. While it can generate relevant texts, it may not always fully comprehend the nuances of complex interactions, hence potential misunderstanding. ChatGPT has been trained on large datasets of texts, but it may not understand or respond correctly, especially to words or phrases it has not encountered before. This is a limitation to its language training as it may also have difficulties with certain languages or specific linguistic nuances, affecting its accuracy (Jiao et al., 2023).

Emotional understanding is also an area the language model falls short. It doesn't have the capability to comprehend and respond to emotional cues which may result in inappropriate and insensitive responses in certain contexts (Ortiz, 2022). Also, its creativity and originality are limited, as the responses it generates are based on the patterns in the data it has been trained on, leading to repetitive and plagiarized work (Susnjak, 2022, p.13). Furthermore, while it can generate convincing texts, the information may sometimes be inaccurate, which leads to misinformation (Tung, 2022). Although ChatGPT encourages users to check the information it gives, there is a risk if the information it produces is used without verification as it has been claimed to generate misleading and harmful content. This is particularly concerning in the fields of law, medicine and finance, where inaccurate information have serious consequences (Guo et al., 2022). Lastly, the quality of responses users receive may be different, while ChatGPT generally produces coherent and relevant answers, it may sometimes generate unclear or incorrect information, especially on new topics (Vincent, 2022).

Given the strengths and limitations of ChatGPT, it is essential to look into the introduction of AI into education. Artificial intelligence has

revolutionized traditional ways of learning and can help accomplish a wide range of tasks. This include, writing assistance, feedback on grammar and punctuation, text summarization and spelling errors (Božic & Poola, 2023). GPT can also be used for study assistance by students when learning, researching and understanding complex topics (Zhai, 2022, pp. 3-5). As I delve deeper into the capabilities and applications of ChatGPT, it is evident that this tool is an example of transformative potential AI in education. The use of ChatGPT by university students highlight the potential and challenges of AI driven educational tools. ChatGPT's ability to assist with learning, research and writing portrays its unique role in reshaping the traditional ways of education. By focusing on ChatGPT we can explore how this AI innovation is enhancing learning experiences, personalizing education, and providing new avenues of academic support, therefore paving way for interactive, efficient, and customized learning.

2.3 Uses of ChatGPT for Students

The application of ChatGPT in higher education ranges from providing study assistance to aiding in research. Different students have their unique ways of using it to meet their needs, objectives and preferences. This section offers some key examples of how ChatGPT is used by University Students.

Study Assistance and Tutoring

As a virtual study assistant and tutor, it is able to offer personalized learning and explain difficult concepts which ensures that students understand complex subjects to the end. Students can also use ChatGPT to get sources needed to write a paper, due to its ability to quickly and effectively summaries lengthy web pages. ChatGPT has also been used as a helping hand for medical students to get through the final moments before they graduate. According to Gilson et al., (2022, p. 5), ChatGPT's performance on medical licensing exam indicates its potential as a valuable educational tool, consistently able to provide accurate information and help students study for exams.

Writing and Editing

ChatGPT functions as a guide to humans, assisting students to handle challenging tasks such as the composition of a paper by helping them write their ideas into actual words, sketching outlines, and eventually composing an entire paper. Its language generation capabilities make it an effective tool for

improving one's essay writing skill. Bommarito&Katz (2022) showed that ChatGPT can write essays which are both coherent and well-structured. Students can read these drafts to improve their writing ability further as it also helps in editing, sentence construction and grammar.

Research Assistance

Undertaking research is a major aspect of higher education programs, most people might say it is the sole purpose of going to university. ChatGPT can help students gather sources together for this purpose, processing a comprehensive literature review and produce summaries from the original literature. Dowling&Lucey (2023) discovered that ChatGPT can help with financial research by generating ideas and themes, drawing together related articles; even data search if the conditions are right for this type of machine tool. The benefit of this is crucial for students working on research projects, since it enables them to be more efficient.

Language Learning and Translation

ChatGPT can be useful for students who are learning new languages or are studying in non-native ones. It can translate texts and even practice conversations. It can also explain grammar rules, which is beneficial for international students and those studying language as it enables them to practice in convenient and easy ways, hence improving their language skills.

Coding and Programming

Computer science and engineering students take advantage of ChatGPT's ability to assist with coding and programming tasks. ChatGPT can help in evaluating code, explain programming concepts and demonstrate algorithm examples. Studies support this use of ChatGPT, such as the work of Kung et al. (2022), which shows that ChatGPT has the ability to answer technical questions accurately and correctly hence assisting in coding issues.

Personalized Learning Experience

It responds to the needs and problems of individual students. Unlike traditional educational resources, ChatGPT tailors its response, this personalized approach helps identify and address unique learning gaps and preferences. Zhai (2022), suggests that integrating AI into learning tasks can engage students in solving real-world problems, thus enhancing creativity and critical thinking skills.

Assessment and Feedback

ChatGPT can also be used for forming assessments and providing feedback. For example it can generate practice questions, simulate exam conditions and offer instant feedback on student's responses. This use of ChatGPT helps students prepare for assessments by identifying areas of weakness and suggesting what they could improve on (Xu et al., 2024)

The diverse application of ChatGPT in higher education, illustrates its importance to university students. As students increasingly integrate ChatGPT into their academic routines, it is essential to consider the broader implications of this AI technology on the educational landscape. While the benefits of enhanced learning outcomes and improved academic performance are evident, the widespread adoption of ChatGPT also raises critical concerns on its impact on academic integrity, assessment methods and teaching practices.

Understanding these potential implications is crucial for educators and policy makers to develop strategies that enhance the positive outcomes of ChatGPT usage while addressing the challenges that may arise.

Overall, given the rise in the adoption and utilization of AI technologies such as ChatGPT there is still scarcity in research that focus on how students use it and specifically at the university level. This study aims to examine how university students use ChatGPT focusing on the motivations, perceptions, challenges and, satisfaction when using ChatGPT to assist in their assignments and solutions they can offer to the impacts that arise due to the integration of ChatGPT in higher education. By conducting this research, I seek to bridge the research gap and contribute to the understanding of AI use in education among university students. Gaining insight from the students is valuable, as they are one of the beneficiaries of these technologies. Additionally, this will help educational institutions to understand student's needs, how to implement AI and improve the learning experience of students.

3. THEORETICAL FRAMEWORK

This theoretical framework will utilize the Unified Theory of Acceptance and Use of Technology (UTAUT) to examine the factors influencing university student's adoption and use of ChatGPT as an AI-powered tool to assist with their academic assignments (Strzelecki, 2023, p.227). UTAUT provides a comprehensive lens to analyze students' motivations, perceptions, challenges and satisfaction when integrating ChatGPT, offering insights into the key determinants of technology acceptance and use in an educational context (Venkatesh et al. 2003, p.426).

UTAUT was constructed by incorporating several pre-existing models of information technology acceptance, which have been extensively utilized across disciplines such as information systems, marketing, social psychology, and management to study technology adoption and diffusion (Wedlock & Trahan, 2019, p.6). The UTAUT model presents four core constructs (performance expectancy, effort expectancy, social influence and facilitating conditions (Williams et al., 2015, p.444). The theory has since been modified to create UTAUT2 which includes three new constructs: hedonic, price value, and habit (Venkatesh et al., 2012, p.160). UTAUT2 is a crucial addition to this framework as it provides a more comprehensive understanding of technology acceptance by presenting these additional constructs which are relevant for analyzing student's interaction with ChatGPT. According to Williams et al., (2015) by examining the presence of these constructs in real world situations, researchers and practitioners are able to assess an individual's intention to use a specific system, allowing the identification of key influences on acceptance in given contexts. The following 5 constructs borrowed from both UTAUT and UTAUT2 models are described and are relevant to the study and will inform the interview questions that will be expanded further in the methods section and used to gain insights from the participants.

Performance expectancy

Performance expectancy refers to the belief of an individual that, using a system will help them enhance their performance in their learning process (Khechine et al., 2020). In this study, this construct will be utilized to examine how much students think utilizing ChatGPT can boost their academic

performance and efficiency.

Effort Expectancy

Effort expectancy refers to the degree of ease of use associated with use of technology (Venkatesh et al., 2003, p.450). This construct is a critical predictor of behavioral intention (Venkatesh et al., 2012). In higher education this construct, refers to students ease of use (Khechine et al., 2020). Similarly in this study, it will help in understanding how much students feel that interacting with ChatGPT is easy and requires minimal effort.

Social influence

Social influence is the extent to which an individual perceives how important others believe he or she should use a particular technology (Venkatesh et al., 2003, p.451). The influence of social circles, has been said to impact user's intention to use a technology. In the academic context, social influence refers to how the opinion of peers and fellow students motivates them to engage with ChatGPT (Khechine et al., 2020).

Facilitating conditions

Facilitating conditions refer to the level of access to resources and support needed to finish tasks (Venkatesh et al., 2003, p.450). In university education settings, facilitating conditions emphasize the importance of having access to reliable infrastructure, knowledge, training and support which can impact user's willingness to utilize educational system. In this study, this construct informs the extent to which students feel they can access technical assistance and training for ChatGPT.

Hedonic Motivation

Hedonic motivation refers to the pleasure or satisfaction an individual derives from using a technology (Venkatesh et al., 2012, p.161). Findings from various studies suggest that users are likely to continue using technology if they experience satisfaction from using it. In this study, hedonic motivation denotes the level of satisfaction students experience when using ChatGPT.

While UTAUT framework has been widely adopted and validated in various contexts, it is important to acknowledge potential limitations. For instance some scholars have argued that the model may oversimplify the complex interplay of factors influencing technology adoption, or that it may not fully capture the unique nuances and challenges of specific contexts or user

groups (Dwivedi et al., 2019). To address such limitations, this study will utilize the data collected through interviews and consider the potential influence of contextual factors specific to the educational setting and use of ChatGPT.

4. RESEARCH DESIGN

This research paper utilized a qualitative interview approach to examine and evaluate the use of ChatGPT among university students. Qualitative research is particularly useful for exploring complex topics in depth, providing a nuanced understanding of participants' experiences and perspectives. The choice of this approach was guided by the need to capture the rich, detailed narratives of students regarding their interaction with ChatGPT, an AI language model that is increasingly utilized in academic settings.

To recruit participants, a poster message was shared through social media platforms, specifically, Facebook and Instagram, to reach a diverse group of students. This form of recruitment was essential due to its broad reach and the probability of engaging students who are active on social media. The poster included information about the study, criteria for participation, and contact details for interested individuals. The study aimed to answer the following research questions:

RQ 1: How is ChatGPT used by university students to assist in their academic work?

RQ 2: What are the potential challenges of ChatGPT use for students?

RQ 3: What are the advantages of using ChatGPT?

RQ 4: How can institutions support students to utilize ChatGPT?

RQ 5: How does the Unified theory of acceptance and use of technology influence students?

4.1 Justification for the Use Qualitative Interviews

Qualitative interviews were selected as the primary data collection method due to its ability to provide a rich source of data suitable for answering the research questions. Interviews enable in-depth exploration of participants' experiences, allowing the researcher to probe deeply into specific areas of interest. The semi-structured interview format was essential as it combined the flexibility of unstructured interviews with the systematic approach of structured interviews in the form of a guide.

1. The semi-structured interviews format facilitated the following benefits: In-Depth Understanding
 - Semi-structured interviews allowed for deep exploration of students' experiences and perceptions related to

ChatGPT. This approach enabled participants to share their personal stories and insights, providing a comprehensive understanding of how ChatGPT is utilized in their academic work (Alshenqeeti, 2014, p.40).

2. Contextual Understanding

- By using semi-structured interviews, the study could identify the context in which students use ChatGPT, including the challenges they face, their concerns, and the factors influencing their interactions with the technology (Saunders et al., 2023, p.1). This contextual information is essential for understanding the broader implications of ChatGPT use.

3. Flexibility and Adaptability

- The qualitative method offered flexibility during data collection and analysis, allowing the researcher to adapt to the process, based on emerging trends and unexpected developments (Kallio et al., 2016, p.2955). This flexibility was important in studying the dynamic and evolving nature of AI use in education.

4. Exploratory Nature

- Qualitative research is well suited for studies aiming to uncover patterns or trends. It allowed for the examination of a wide range of factors that may have influenced students to use ChatGPT, providing insights that might not emerge through quantitative methods (Sandelowski, 2001, p. 231).

5. Holistic Perspective

- Qualitative methods facilitated a holistic perspective, considering multiple dimensions of the study such as perceptions, motivations, solutions and satisfaction related to the use of ChatGPT (Hesse, 2005, pp. 5-6). This comprehensive approach ensured a deeper understanding of the phenomenon under study.

6. Participant Voice

- Prioritizing the voices and perspectives of participants allowed students to express their thoughts, feelings, and opinions in their own words. This approach provided a platform for enabling a deeper understanding of the human side of technology use (Chandler et al., 2015, p. 2).

7. Iterative Research Process

- Qualitative research involves a repetitive process of data collection, analysis, and interpretation. This iterative process allowed for the continuous refinement and validation of findings, enhancing the credibility and validity of the research outcomes (Srivastava & Hopwood, 2009, p. 77).

4.2 Sampling

The study comprised a total of ten university students from Kenya and Netherlands who had previously interacted with ChatGPT for their academic endeavors. The sample included six females and four males, aged between 21 and 30 years. This diverse group of participants was chosen to collect a wide variety of experiences and perspectives on the use of ChatGPT in higher education across different cultural and educational contexts.

The participants were selected through convenience sampling, a type of non-probability sampling where participants are chosen based on their accessibility and proximity to the researcher. This sampling method was suitable due to the time constraints and limited resources, furthermore, it allowed for rapid and efficient recruitment of participants. The use of social media platforms for recruitment facilitated easy access to potential participants while providing a wide reach to engage with a diverse group of students. Publishing a request for participation on social media, allowed me to attract participants who were genuinely interested and motivated to share their experiences with ChatGPT. The interviews were conducted online using Microsoft teams, which was a convenient choice as the conversations were transcribed verbatim during the call. Online interviews made it possible to include participants from different geographical locations without the need to travel. Moreover, conducting interviews online allowed me to schedule and

conduct multiple interviews in a limited timeframe. The interviews lasted 45 to 60 minutes, providing ample time for participants to share their experiences in detail. However, two interviews out of the 10 conducted lasted 30 minutes. Despite the efforts made to conduct a second round interview, the two participants were not forthcoming with their responses leading to shorter interviews. The semi-structured interview guide used during the sessions aimed to gather comprehensive understanding of the benefits, challenges, and solutions associated with using ChatGPT in higher education.

4.3 Data Collection

The data collection process for this study involved conducting qualitative interviews using a semi-structured interview guide. The purpose of these interviews was to explore university students' perceptions, successes, and challenges when using ChatGPT for their academics. The semi-structured questions served as a framework for conducting the interviews and guiding the conversations with the participants (Adam, 2015, pp. 493-494). In order to achieve the best results, the development of the guide was mainly founded on the research questions and objectives of the research, which helped in identifying the key areas of inquiry that needed to be addressed during the interviews. Additionally, a comprehensive list of literature reviews assisted in getting insights into existing studies, theories, and frameworks related to ChatGPT usage. This provided valuable context and theoretical grounding for designing the interview guide, informing the selection of relevant topics and themes to explore. The questions were open-ended and covered the following areas: motivations, perceptions, challenges, overall satisfaction, experience in different academic fields, and suggestions for enhancing integration of ChatGPT in education. The flexibility and adaptability of the guide allowed for the exploration of emerging themes and following up on interesting responses. All interviews were recorded with participants consent ensuring accurate data collection. By following this systematic process the interview guide was a crucial tool for collecting rich qualitative data that contributed to the in-depth and valuable findings of the study.

4.4 Data Analysis

This research utilized thematic analysis outlined by Braun and Clarke (2006). Using this approach ensured my analysis captured the depth and

complexity of the data, providing an extensive understanding of relevant aspects. This method is time-tested for its ability to identify, analyze, and interpret themes in qualitative data (Nowell et al., 2017, p.2). Figure 1 shows the phases of thematic analysis and figure 2 highlights the details of actions. This provides an effective way of understanding an individual's opinions, ideas, and awareness regarding certain aspects in a structured and systematic way (Braun and Clarke, 2019). Conducting a thematic analysis follows a six-step process namely: familiarization with the data, coding, generating themes, and reviewing themes, defining and naming themes, and analyzing the data using the created themes (Caulfield, 2023). Thematic analysis was applied to the data from the interviews which were transcribed using Microsoft Teams that was also used to record the conversations. The transcripts were then manually reviewed to ensure accuracy. The process of transcribing data helped identify emerging themes and trends, which allowed for further refining of data. The transcribed data was cleaned to remove any irrelevant information and errors, which ensured the quality and reliability of the data for accurate and coherent analysis. In order to achieve familiarity, I read the transcripts while marking the significant codes. The codes were used to generate sub-themes and overarching themes that conceptually connected to the data. Subsequently, the themes were reviewed and redefined to accurately represent the information collected. Analysis of the themes aided in the formulation of research findings.

4.5 Ethical Considerations

Acknowledging ethical considerations is crucial when conducting qualitative interviews. Protecting the privacy and confidentiality of participants is one of the key priorities. A copy of informed consent was sent to each of the participants before the scheduled interviews (Appendix B, p. 41). It informed them of the purpose of the study, its nature, and potential risks. The form also outlined their right to withdraw at any point if they felt uncomfortable, and assured them that their participation was voluntary. Participants provided their consents electronically, acknowledging their understanding and agreement to participate in the study. To maintain Anonymity and confidentiality participant's names and any identifying information were excluded and final data sets. To protect the identities of the participants, pseudonyms were assigned to each one of them instead of using their real names. The participants were informed on

these measures to reassure them of their privacy and secure handling of their data. Because all the interviews were conducted online, I ensured the participants felt comfortable and secure. They were provided enough time to contemplate on their responses assisting them when it was necessary. This included clarifying the questions in case they did not understand. To ensure ethical integrity and robustness, four key principles were prioritized. To begin with, the research strived to accurately represent the participants' views and experiences, ensuring that their interpretations closely aligned with their intended meanings. This involved rigorous and careful transcriptions. Secondly, while the study focused on University students and ChatGPT, it also considered how the findings might be relevant in other educational contexts or with different AI tools. This broader perspective allowed for the potential adaptation of the insights to various settings. Thirdly, the research process was clear and had a detailed record of the data collection methods, and data analysis. This transparency not only strengthened the reliability of the study but also provided a clear roadmap for future researchers who might wish to conduct a similar research. Lastly, to minimize bias, the conclusions were grounded firmly on the data collected. I strived to ensure my personal views did not influence the interpretation of the results. The data combined with the analytical processes were documented and used to link the participants' responses and the existing literature.

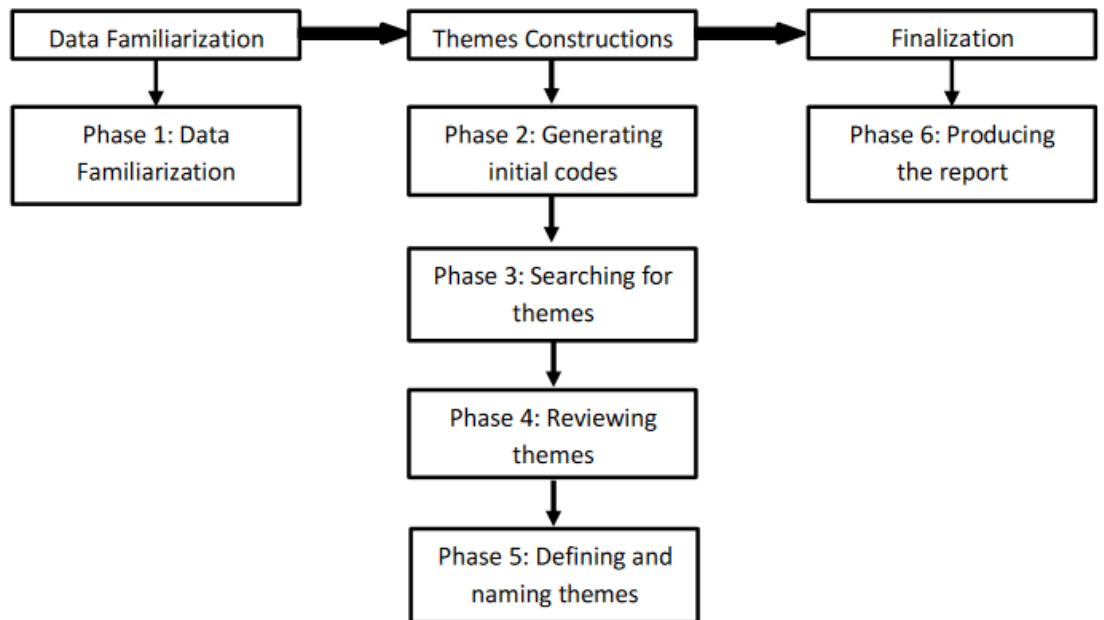


Figure 1: Thematic analysis framework

4.6 Operationalization

To examine the use of ChatGPT among university students, it is important to transform the abstract concepts of the research into measurable concepts. This will link the theoretical constructs to the empirical observations. In this study, the operationalized key concepts will be guided by the UTAUT framework which provides a comprehensive lens to analyze students' motivations, perceptions, challenges, and satisfaction when utilizing ChatGPT. The following section will detail how each concept has been operationalized explaining the specific measure and indicators used to assess students experience with ChatGPT.

Performance expectancy was operationalized by examining the students' perceptions of ChatGPT's ability to enhance their academic performance and productivity. To measure this construct, participants were asked specific questions about their expectations and experiences with ChatGPT in academic contexts. For instance, participants were asked, "In what ways do you think ChatGPT has impacted your academic performance or productivity?" This question aimed to get students perception of the impact of ChatGPT on their overall academic performance and productivity. The measurement of performance expectancy also included questions about continued use, such as, "What factors influence your decision to continue using ChatGPT for assignments? This questions was designed to uncover the valued outcomes

students associate ChatGPT with such as increased productivity and grades.

Effort expectancy was operationalized by assessing students' perceptions of the ease of use and the effort required to utilize ChatGPT effectively in their academic pursuits. To measure this construct, participants were asked, "Do you think ChatGPT is user friendly?" This question elicited different responses on the user interface and how easy it was to navigate ChatGPT without having technological experience or prior knowledge.

Hedonic motivation was operationalized by assessing the enjoyment and satisfaction students derived from using ChatGPT for academic purposes. To measure this construct, participants were asked, "On a scale of 1-10 how satisfied are you with ChatGPT?". This was to assess their level of satisfaction with using the tool. Additionally, "what aspect of ChatGPT do you find most valuable" This identified specific elements that contribute to the hedonic value of the tool.

Facilitating conditions were operationalized by assessing the level of support, resources, and infrastructure available to students for effectively using ChatGPT in their academic work. To measure this construct participants were asked. "Is there a way institutions could support students to overcome challenges of ChatGPT" This helped in uncovering the facilitating conditions within the academic environment.

Finally, Social influence was operationalized by assessing the impact of peers, instructors, and the broader academic community on students' perceptions and use of ChatGPT. To measure this construct, the interviews captured various aspects of social pressure. Participants were asked, "What was your motivation to start using ChatGPT in the first place?" This provided insights into their motivations of using the tool. Additionally, to measure the impact of social stigma, we posed the question, "How comfortable are you discussing your use of ChatGPT with your peers?" This uncovered the stigma associated with ChatGPT use such as cheating and academic integrity.

4.7 Limitations of the Study

During the data collection and interview process, several limitations and challenges were encountered that affected the effectiveness and efficiency of the study. To begin with, there was a challenge to ensure that each of the interviews lasted the required duration of 45-60 minutes. Secondly, most of the participants

from the Netherlands were also working on their thesis, resulting in tight schedules, which made it difficult to secure enough time to hold longer in-depth conversations. Additionally, the Kenyan participants always scheduled the interviews at night due to daytime commitments, and the one hour time difference was an inconvenience, this caused scheduling conflicts for both parties.

Furthermore, the lengthy conversations although necessary for comprehensive data collection was draining and tiresome. As I conducted the interviews I became less enthusiastic and often changed the interview schedules to give myself time to relax before continuing with other participants. After the first two days, I reduced the number of interviews from two students to one in order to combat this challenge. However, the fatigue potentially affected the quality of probing questions as I was unable to concentrate and listen keenly in some moments, the participants were also tired towards the end of the interviews which affected the quality of responses. Technical issues were a challenge, network problems caused disruptions with some participant's experiences connectivity issues, leading to moments where they were unintentionally muted due to WI-FI instability. These disruptions hindered the natural flow of conversation as I had to repeat myself a lot when such instances occurred.

4.8 Personal Reflection

It is important to acknowledge my position and how my background and experiences may have influenced the study. As a master student who has extensively sought the assistance of ChatGPT for academic purposes, I have the experience of the benefits and challenges associated with this technology. My familiarity with the tool as well as my academic environment shaped the kind of research questions that I want answers to. Furthermore, using and having my own perspective of ChatGPT allowed me to build a rapport and have a good understanding of the responses my participants gave, they also felt comfortable to converse as they perceived me as someone who shared their experiences and relates to their views. However, familiarity with the tool presented a risk of bias as my experiences might have influenced the way I framed the questions and interpreted the responses.

My cultural background and educational context may have also played a

significant role. Being a Kenyan and having studied my bachelors there, and my current studies in an international context, were beneficial in understanding the diverse experiences from both Kenya and the Netherlands. The downside of this was I constantly had to check for biases that might arise from my own preconceptions and experiences. Initially I assumed that most of the students would have positive feedback on using ChatGPT to assist with their assignment. This was informed by the online articles and videos I have watched that praise the AI tool as a game changer but this was not the case in some instances. Most participants painted a picture of an AI tool that was partially beneficial meaning, they could not fully rely on it as they had experienced challenges such as inaccurate information when using it. Additionally, the students were skeptical as to whether ChatGPT could improve their academic performance with most of them believing that their performance remained the same and they could perform far much better than the AI tool using it only as a guide. To eliminate this assumptions I remained open to negative and neutral responses and further probed to understand their opinions.

5. RESULTS

This section presents the findings from the qualitative research interviews conducted. The data derived from the in-depth interviews underwent thematic analysis to identify similar patterns, themes, and insights that are relevant in answering the research questions of this study. In review of the analysis for research question 1: how is ChatGPT used by university students to assist in their academic work?

I identified five primary categories, all of which had multiple subcategories.

RQ 1: How is ChatGPT used by university students to assist in their academic work?

When asked about their use of ChatGPT, participants shared the different ways they use the AI tool to assist in their academic work. The following themes present the responses provided.

Academic Research

The first category I identified was academic research. By this I mean the process of discovering, interpreting and revising knowledge in a particular topic. Within this category, I first noted the subcategory of literature review. In this category, participants resoundingly asserted that they frequently used the tool to find different literature which they needed to write their papers. ChatGPT is able to assist in identifying and summarizing relevant academic papers, articles and journals related to different research topics. For example Ara said, *“I read some papers, some I read especially the ones that are like maybe introductory to the topic and the more specific ones I put through to ChatGPT to give me summaries or sometimes I even just go to ChatGPT and I'm like, I need to write a paper about this and I want to talk about this and this and this. Can you give me some papers about the topic that can be useful?”*. By synthesizing information from multiple sources, students are able to read through literature by looking into the key highlights and significant contributions without wasting time.

Additionally, the second subcategory was data analysis and interpretation. ChatGPT can offer insights and explanations to datasets, helping students to interpret their results. For example Rimi mentioned that, *“So I usually write the report or I also give the data I've collected and then I tell ChatGPT, makes sense of my data or what does my data say? It's a lazy way to*

learn your data but when I get the data and I want to graph it or make sense of it ChatGPT assists and I can get my insights and then finish my report.” By analyzing large volumes of data, ChatGPT can be able to assist in data analysis and find patterns and insights that may not be immediately apparent to a researcher, therefore it is valuable in provide unique analysis.

Moreover, the third subcategory was knowledge and concept exploration, participants also mentioned that they used it to find more information about certain topics and this was able to help them fill in certain gaps in their understanding and broadening their perspective. Barry stated, *“By engaging the AI you can gain more information other than what was just taught within the classroom”*.

Lastly, the final subcategory was research design and methodologies. ChatGPT can provide guidance on research design, research questions, and methodology. This assists students to plan and execute their studies effectively. Alice who was writing her thesis at the time of the interview said, *“So, when we are given like... especially the thesis, I wanted a topic but I wasn't sure like what theories I could use...It wasn't that good in it, but it did help me eventually rephrase it and I asked ChatGPT this is my research question can you give me like some examples of theories that I could use to answer this and it gave me like a bunch.”*. So when students encounter challenges during their research, ChatGPT is able to provide them with valuable solutions that enhance the quality of their work and make their research journey easier.

Academic Writing

The second category I identified was academic writing. By this, I mean the writing process that AI tools like ChatGPT can support from generating initial content to refining existing texts. Within this category, I first noted the subcategory of writing assistance and enhancements. Participants highlighted the important role ChatGPT plays when it comes to enhancing their academic writing process. They said the AI tool provides assistance across various stages of writing such as generating writings based on the provided prompts and outlines. This is valuable to a student who may lack the right words when writing their papers. As Ara mentioned, *“when you're writing an essay, it suggests like phrases or like how to rewrite a paragraph to be clear. So that's kind of useful”*.

Second subcategory was content expansion and topic coverage, students also noted they are able to get assistance from ChatGPT as it can help in expanding key ideas and more coverage of the topics they are writing on. Barry mentioned, *“By engaging the AI you can gain more information other than what was just taught within the classroom”*

Third, ChatGPT can also be used for correcting grammar and editing, it is able to proofread and suggest revisions on grammatical mistakes, spelling, punctuation which enhances the readability and flow to produce coherent work. For example Mitra mentioned, *“I found other things it was useful for, like correcting expression mistakes that I might have. This is the change that has happened in terms of how I use it. Now that I am more confident with the terms, but not with my grammar especially with the thesis, I am writing huge texts and I’m sure that I will have sloppy mistakes so it helps me”*.

It is also worth mentioning before moving to the next category that despite the constant debate surrounding the fake references that ChatGPT gives (Ngo, 2023), some participants confirmed that they were able to get references and citations from the AI tool but only on the paid version. Rono said, *“Yes I mostly use it when I’m trying to get specific citation like from scientific journals it mostly like a shortcut instead of going the long route of I have to go to Google scholar... I just say psychological well-being among Nurses give two scientific citations it brings it up there and it’s just for me to confirm if this is what I want and then I pick it. So mostly I use it to give me citations as I am writing things out”*.

Brainstorming and Development

The writing process involves several stages, from brainstorming to the final written report. The first stage is pre-writing where you can generate and organize ideas followed by gathering information to support your ideas. Third, you can draft your ideas and put them into words then refine them by ensuring the structure and writing is flowing. Thereafter, you can polish the final product ensuring the grammar is correct and there are no spelling errors.

The third category I identified was brainstorming and development. By this, I mean how ChatGPT can stimulate new ways of thinking and help users overcome creative obstacles. Within this category, I first noted the subcategory of overcoming writers block. In this category, participants indicated that

ChatGPT was a good tool for generating ideas. It provided them with new ideas on topics on different areas of interest when they experienced writing blocks, stimulating new ways of thinking. Rimi mentioned, *“It works with me to attain a specific result under my instruction, so I like using it a lot for brainstorming, so maybe I'd have an article idea and I know I want to write on maybe child abuse or something like that, and I tell it this is what I have in my mind could you draft an introductory paragraph and it drafts the paragraph”*.

Apart from that a good number of students talked about structuring of a paper, where ChatGPT was able to assist them in coming up with outlines for essays, and research papers ensuring a logical flow of ideas, Ara confirmed this by stating, *“I usually rely on ChatGPT for very boring tasks. Things that I wouldn't want to do like structuring a paper or things that I already know how to do, but I don't want to waste time doing so while ChatGPT can help me, like decide the chapters of my thesis”*.

Another valuable use mentioned by the students was the ability to summarize lengthy, articles, papers and even their own writing. This made it easier for them to easily identify key points without reading through an entire paper to find out if it was relevant to use. Mitra stated, *“if I read something on ChatGPT or if it explains a concept to me, I understand it better than reading a whole book because it summarizes for you the important points”*-08. Another student responded by saying, *“Also if we have a word limit in an assignment, I put a big paragraph on ChatGPT and I tell it to reduce some words.”*

Comprehension Support

The fourth category I identified was comprehension support. By this, I mean the assistance provided in understanding complex and unfamiliar concepts. Within this category, I first noted the subcategory of understanding complex and new concepts. In this category, participants expressed that ChatGPT was useful in helping them comprehend complex writing and unfamiliar concepts. In academic writing, there can be new terms that are difficult to understand especially if you are not familiar with a certain field of study. Thanks to ChatGPT students can look up this terms and find relevant explanations. Feng' stated, *“Mostly I use it for things I'm not familiar with or if I get a new concept...For instance, when I started my study, I had a lot of new concepts, vocabularies about these different theories, phenomenon of the Media*

study for me it was quicker to ask ChatGPT to just give me a brief introduction about the things.”. This area didn't have as many subcategories as the other elements but still represents a significant finding in the data.

Guidance

The fifth category I identified was guidance. By this, I mean how students view ChatGPT as a tool that offers suggestions as to what they can do to handle certain situations. Within this category, I first noted the subcategory of mentorship. In this category, ChatGPT can serve as a valuable resource for providing guidance and mentorship to students, it helps in navigating academic challenges by providing academic advice on research topics, and study strategies. As Alice put it, *“it evolved to being like my like explainer an expert that I can ask advice. Now it's that. Oh, I just ask it for like what can I do.*

The second subcategory was language assistant. This category emphasized that ChatGPT was particularly beneficial for students who experienced language barrier as they are non-native English speakers. ChatGPT is capable of translating which provides students with the option of writing an idea in their native language which they understand better and translating it into English. Kwam said, *“I think I was struggling with language because in Kenya, our education is in British English and now I'm learning in American English. Also in Kenya we are bilingual, so it was a bit of a struggle writing papers or how to translate and email.”*.

The findings above reveal that university students utilize ChatGPT in various ways to support their academic work. From assisting with academic research and writing to aiding in brainstorming, comprehension, and providing guidance, ChatGPT has become a versatile tool in students' academic endeavors. However, as with any technological advancement, the use of ChatGPT is not without its challenges. While students appreciate the benefits of using the tool, it is crucial to consider the potential drawbacks and limitations that come with integrating this AI tool into academic practices. In this section I identified another six themes.

RQ 2: What are the potential effects of ChatGPT use for students?

Although the use of ChatGPT is appreciated, their limitations need to be considered. This will ensure users responsibly and effectively utilize it. These limitations span from various aspects of its functionality and output, affecting

its reliability as well as its application in different scenarios.

Impact on Creativity and Cognitive Ability

The first category I identified was impact on creative and cognitive skills. By this, I mean the essential skills that constitute the overall mental capacity. Within this category, participants expressed concerns that overreliance on ChatGPT might hinder their creativity to develop new ideas and their cognitive abilities to think critically may also diminish. They felt that while technology provides quick solutions, it could lead to a reduced level of autonomy and independent learning. Barry stated, *“It influenced my cognitive ability... Sometimes I felt that the assignments I submitted could have been better because I would have put more effort but since I wanted to do things fast to save time I relied on the guidance of the AI so much and did not think outside the box. It kind of gave me tunnel vision and made me lazy to think beyond what it was offering.”*

Laziness

The second category I identified was laziness. By this, I mean the unwillingness to put effort as a result of ChatGPT’s ability to handle work they are reluctant to do. Within this category, students cited that they became lazy as a result of using ChatGPT. They had easy access to answers and information which reduced their need to put effort in conducting research and learning. Alice mentioned, *“I write it myself first and I would be like make it nicer put it in Dutch or English whatever, but me translating something into Dutch would actually add to my learning experience but ChatGPT is taking that away because they can do it so fast. While it helps me, it’s also in a way indirectly makes me more lazy and takes away my learning process. But I choose for it, so?”*

Stigma of Use

The third category I identified was stigma of use. By this, I mean the shame and judgment that comes from other people knowing that you use ChatGPT. Within this category, when asked about if they openly admit to using ChatGPT among peers, a subset of participants cited fears of being judged stating that it was mainly associated with academic dishonesty, furthermore, their work might receive extra attention from their teachers rubbishing their efforts and abilities. As Rono stated, *“I tend to keep it to myself or only discuss*

it with close friends who I know wont judge. Unfortunately, there's still a stigma around using AI tools like ChatGPT in academic settings. Some people see it as a shortcut or even as being disingenuous. So, I prefer not to advertise it openly to avoid any potential negative perceptions."

Limited and Inaccurate Information

The fourth category I identified was limited and inaccurate information. By this, I mean the lack of a range around topics and incorrect information. Within this category, Participants expressed doubts about the accuracy and limited responses the model provided. ChatGPT's knowledge is based on trained data fed into it by different users and it may not cover topics comprehensively. Participants also complained of outdated information which is as a result of the limited data to its last training meaning it may not include recent developments. Maxi, *"Let's say outdated info... I go to the platform you find that since they put up the information they've never updated it which is really annoying... us being guys who are studying or researchers or academic guys we need current information in anything you are putting down."* Regarding accuracy, participants highlighted instances where the model provided wrong information to the users. Mitra said, *"ChatGPT is not like the Goat (Greatest of all time) it can create some mistakes so I reduced the use of it especially in explaining things to me because it might give me wrong explanations."*

Prompt Challenges

The fifth category I identified was prompt challenges. By this, I mean the difficulties students go through to use the correct terms and key words to get good responses. Within this category, a good number of students expressed the need to learn or have a good knowledge of how to phrase questions asked in order to get the desired responses. Achieving high quality often requires well-crafted and specific prompts and this can be a barrier for students who do not possess this skill. Rimi mentioned, *"Well, during my time of research, I came to discover the quality of your prompt dictates the quality of response you get... So I understood that from very early on and I tried to make better prompts because what I found was, when I would ask ChatGPT to do something and it is not able to do the particular task that I have asked it to do, I would put out another prompt, but I've rewritten the prompt in a different way."*

Impact on Traditional Forms of Testing

The sixth category I identified was impact on traditional testing. By this, I mean the difficulties faced by institutions to maintain current forms of testing with the rise of AI tools such as ChatGPT. Within this category, I found passages indicating that the use of ChatGPT may undermine traditional forms of assessments like essays and written exams, as some students abuse it and rely on it to generate responses rather than using it as a guide to come up with their own. Educators may find it difficult to assess the authenticity of a student's work when ChatGPT is used extensively. Rimi stated, “*When we are talking about assessments. I also interviewed lectures for my study and from their own mouths they cannot tell students to go and write essays like they would get before. They would only tell them to do that within the classroom. So in that instance it's already affecting assignments. It's already affecting academia, because of the fact that students can access this particular tool and you cannot limit or control the access because they have devices.*”

In the previous section, I have identified and elaborated on six key themes regarding the potential effects of ChatGPT use for students. These themes include the impact on creativity and cognitive ability, increased laziness, stigma of use, limited and inaccurate information, prompt challenges, and the impact on traditional forms of testing. Each theme highlights various aspects of how ChatGPT influences student learning, behavior, and the academic environment. This comprehensive analysis provides valuable insights into the drawbacks of ChatGPT usage in educational settings. Building upon the previously discussed themes, we now move to exploring the perceived benefits of using ChatGPT for students. This section will focus on three primary benefits.

RQ3: How do university students perceive the benefits of ChatGPT?

The interviews revealed several benefits of ChatGPT usage among university students. Here are some themes that best explain these benefits.

Efficiency and time saving

The first category I identified was efficiency and time saving. By this, I mean the ability of ChatGPT has to streamline tasks and eventually save time. Within this category, students emphasized that ChatGPT helped them to minimize the time used to handle certain tasks they consider redundant while

increasing their productivity, additionally, the quick responses users get when using ChatGPT makes the research process more efficient. Ara mentioned, *“I think generally it has impacted my productivity positively... I usually rely on ChatGPT for very boring tasks. Things that I wouldn't want to do like structuring a paper or things that I already know how to do, but I don't want to waste time doing”*

Personalized learning and feedback

The second category I identified was personalized learning and feedback. By this, I mean the ability of ChatGPT to act as a tutor that you can ask questions about topics you need answers on. Within this category, participants found ChatGPT was very helpful in providing tailored instructions to meet their individual needs, preferences, and interests. Students who are not comfortable asking questions in class particularly benefit from this as they are able to learn at their own pace and receive real time feedback. Rimi, *“However, there was also a very large majority of students who were relying on the fact that ChatGPT offered personalized feedback and individual learning. And that's very helpful as a student because I know I can learn 24/7 and receive feedback 24/7. I don't have to wait until I get to class to know whether my question was right or whether there is more information on this particular tool, ChatGPT can help me with that and the aspect of personalized learning, it's in the sense whereby, since you can train ChatGPT, or rather you can give it instructions and over the course of time it picks up and it responds according to the way you have trained it to respond.”*

Enhanced productivity

The third category I identified was enhanced productivity. By this, I mean how academic processes are made easy hence users accomplish more tasks, within less time and with good quality.

Within this category, participants unanimously expressed their satisfaction with ChatGPT's ability to enhance productivity. It gave them more confidence in the work they produced and also eased their workload especially for students who are working while studying. Alice mentioned, *“I think that I perform faster... And I feel more secure with what I present to school because, maybe my grammar is good in my opinion but it wasn't good enough for school. Now if I ask ChatGPT can you check my grammar? Can you make it more concise? It*

helps and I can be sure that it's good. So for my academic performance I became more confident and faster I would say because of ChatGPT.”

The analysis of university students' perceptions regarding the benefits of ChatGPT revealed three primary themes: efficiency and time-saving, personalized learning and feedback, and enhanced productivity. Students appreciated ChatGPT's ability to streamline tasks, provide quick responses, and offer tailored instructions to meet their individual needs. The AI tool was particularly beneficial for students who were uncomfortable asking questions in class, allowing them to learn at their own pace and receive real-time feedback. Additionally, students reported increased confidence in their work and improved academic performance due to ChatGPT's assistance. To ensure effective and responsible use of ChatGPT, institutions can implement various supportive measures. In the following research question, students shared the suggestions that institutions can utilize to integrate the use of ChatGPT into education. This section will focus on three main recommendations.

RQ 4: How can institutions support students to utilize ChatGPT?

Institutions can play an important role in helping students to effectively and responsibly utilize ChatGPT by implementing a range of supportive measures. The participants gave suggestions about the kind of support institutions can offer to students.

Awareness and sensitization

The first category I identified was awareness and sensitization. By this, I mean how institutions should be at the fore front to ensure students are in the know about how to utilize ChatGPT effectively and responsibly. Within this category, participants expressed the need for institutions to raise awareness about the availability and potential benefits of ChatGPT ensuring students understand how it can support their academic work. They added that Universities should have a positive perspective towards the tool and accept it but establish clear guidelines and policies for ethical use ensuring students understand to what extent they can use it. Barry said, *“There is a need for sensitization and even preparation because AI is coming at a time when the younger generations are proactive to technology compared to the older generation which includes lecturers... the universities should come up with policies that allow a certain level of ChatGPT in terms of assisting as a guide*

and nothing more.”

Training

The second category I identified was training. By this, I mean organizing workshops that offer hands on practical lessons which is beneficial to students. Within this category, the students suggested it would be beneficial to introduce sessions where they would receive comprehensive training on how to effectively use ChatGPT, including crafting effective prompts and integrating AI assistance into their study routines. Mitra said, *“I think they should have an introduction course or seminar to explain what ChatGPT is because students are going to find out anyway, they should educate on how students can use it.”*

Integration into academic curriculum

The third category I identified was integration into academic curriculum. By this, I mean how ChatGPT can be seamlessly added into the university curriculum. Within this category, participants shared that universities needed to find a way on including ChatGPT into academia not only for the students benefit but even for teachers. Alice mentioned, *“Educators can also really use ChatGPT for more creativity in class and bringing more fun. Sometimes the classes are a little bit boring.”* Incorporating ChatGPT into classroom activities and assignments could encourage more engagement from the students and also enable them to have a hands on experience of using the tool in a controlled and educational environment. Mitra added, *“I found it very smart for the professor to incorporate ChatGPT into the assignment and in that way you could understand that the academic knowledge is above ChatGPT but also it can create for you a good foundation to build. So I am happy with how my university is doing things I don’t know about the others but they should not restrict it because students are still going to use it anyway.”*

Having explored how institutions can support students in effectively and responsibly utilizing ChatGPT. Three main categories of support were identified: awareness and sensitization, training, and integration into the academic curriculum. These findings highlight the importance of proactive institutional involvement in guiding students' use of AI tools like ChatGPT in academic settings. Moving forward, the study will examine how the Unified Theory of Acceptance and Use of Technology (UTAUT) influences students' adoption of ChatGPT. In this section I identified five primary thematic supports

to this theory. I chose this theory through which to analyze my results because it encompasses a comprehensive framework for understanding technology adoption. Additionally, it is widely recognized as the one of the most utilized validated and reliable models for studying technological acceptance and use. This compliments to the more inductive patterns that emerge because it provides structure and foundation that can help explain and predict these patterns.

RQ 5: How does the Unified theory of acceptance and use of technology influence students to use ChatGPT?

The theory provides a framework for understanding how various factors influence the acceptance and use of technology. The following results explore the different constructs of UTAUT influence students use of ChatGPT.

Performance expectancy

The first category I identified was performance expectancy. By this, I mean the degree to which an individual believes that using a particular system or technology will help them improve their job performance and achieve gains in productivity. Within this category, participants asserted that indeed ChatGPT was a significant tool in their learning journey as it made their life easier by reducing the number of tasks they needed to handle alongside their busy schedules. They were particularly grateful with the fact that it enhanced their productivity with Barry mentioning, *“I had evening classes to attend and I was exhausted, so I had heard of ChatGPT before and how it was saving time by increasing productivity and I decided to try it out to assist in my busy schedule and to my surprise whatever information I needed was readily available.”*. When it came to the enhancement of their learning experience, the students unanimously said it was a combined effort as ChatGPT alone could not supplement classroom learning. Barry mentioned, *“I’ll share my two sides of the coin, The first one, is a bright student who is hardworking and focused, it will enhance because it will help a student for example, in mechanical engineering, who maybe after the classes will go an extra mile and try to find out more about what was just taught in class... but now on the other hand, some students will use the AI to provide the answers and solve problems but will not be enthusiastic about learning anything, therefore, it will reduce the creativity so for a student who is not focused it will make them even lazier”*

Effort expectancy

The second category I identified was effort expectancy. By this, I mean the degree of ease associated with using a particular technology or system. Within this category, the students said that generally, ChatGPT was quite easy to use and did not require technological knowledge especially in this digital era. Some of the student talked about the user friendly interface of the tool, with Maxi stating, *“Let's just start with the software itself, the interface, the navigation on it is easy. I think even people who are not so good with technology can use it.”* Additionally, the participants felt that the tool was easily accessible and simple, giving users an easy time when working. To this effect Feng’ said, *“I think it's really like easy to use, you can tell if you don't understand something or you want it to make the information shorter or longer or rewrite it. So I think even if you have never used it before you can still figure it out.”*

Social influence

The third category I identified was social influence. By this, I mean how an individual's behavior is shaped by their perception of how others view their use of technology. Within this category, when it comes to human behavior, social influence has been found to have an influencing role. That was not any different in the responses from the students who admitted that their motivation to use the AI tool was as a result of influence from peers, lecturers, curiosity, and social media. Some of the excerpts from the students highlighted, Alice mentioned *“So, I only started using ChatGPT when it came viral on TikTok and even then I was like I don't want to use it, I really don't but eventually I was like let me just see what's the hype and that was last year during my pre-master, especially for my thesis”*. Ara stated, *“I tried it out of curiosity as well. For what it could do, and I was in an environment where it was very hyped up.”* Finally, Rimi said, *“Well, my supervisor posited the idea to me, and I'm very grateful he shared this particular idea.”*

Facilitating conditions

The fourth category I identified was facilitating conditions. By this, I mean the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of a system or technology. Within this category, the students were clear that the paid version of ChatGPT

which is 4.0 was much more efficient and gave better outcome due to its additional features. One participant Upgraded after a friend recommended it, which further emphasizes the value placed on the increased functionality available on the paid version. Ara who has subscribed said, *“The paid version is a lot more precise with its answers, it's connected to the Internet, so it gives you up to date replies and also the fact that you can upload files instead of just typing it out, I think it's really useful.”*

Hedonic motivation

The fifth category I identified was hedonic motivation. By this, I mean the pleasure or enjoyment derived from using a technology or system. Within this category participants were asked about their level of satisfaction with ChatGPT use, they were fairly satisfied but felt that there could be room for improvement especially with the different challenges they experienced, including repetitiveness, fake references, and inaccurate information. In contrast with users who had access to the paid version, they were more satisfied with Alice stating, *“I'm very happy with it. I'm super happy with it. Yeah, I'm just very happy. I'm 9 happy for sure. It made it much easier. It feels like I have someone to back me up and ask it questions if I have concerns. So yeah, it made my academic year more like easy, fast and structured I would say in a way”* on the other hand of the divide, Essy said, *“I'd say it works well for me to an extent. If I have to rate it out of 10, Maybe a 7.5. I'd say it has been useful to me fairly well but there is still room for improvement. Especially sometimes you ask it questions and you realize that since it was last updated with information in 2022, if the topic you are researching is new 2023-2024 it is not very helpful.”*

UTAUT provides a comprehensive framework for understanding students' adoption of ChatGPT in higher education. The study explored five key constructs: performance expectancy, effort expectancy, social influence, facilitating conditions, and hedonic motivation¹. Students generally found ChatGPT to enhance their productivity and learning experience, though they emphasized it should complement rather than replace traditional learning methods. The tool's user-friendly interface and accessibility contributed to its ease of use. Social factors, including peer influence and social media trends, played a significant role in students' adoption of ChatGPT. The availability of a paid version with advanced features was noted as a facilitating condition that

improved user experience. While overall satisfaction with ChatGPT was high, particularly among users of the paid version, some limitations were identified, such as outdated information and inaccuracies. The following discussion is keen to analyze how the findings are supported or contradicted by the existing literature followed by the implications of those findings and what recommendations can be offered to institutions and students regarding ChatGPT integration into education.

6. DISCUSSION

6.1 Key Findings

In this study, interviews were conducted with students from higher education to find out how they used ChatGPT, advantages and challenges of its use, the support institutions can offer to students, and the influence UTAUT has on its continued use. The research found that, students used ChatGPT for academic research, including searching for literature, summarizing papers, and data analysis. It also revealed that ChatGPT is useful but not without challenges. Despite its efficiency, productivity and ability to provide personalized learning and feedback, there was a concern of the impact it has on cognitive and creative abilities, the limited depth and inaccuracy of information, the stigma that comes with its use, the impact it could potentially have on traditional forms of testing, struggles with prompting to get the best output and the laziness that creeps in. When it comes to the support the institutions can offer, it is clear that they need to create awareness of the tool, conduct training on how to use it, and integrate it into the curriculum. Lastly, the findings revealed different constructs of the UTAUT model influenced the use of ChatGPT use among students. Performance expectancy highlighted the increased productivity experienced by the students making their lives easier, effort expectancy highlighted that ChatGPT was easy to use and did not require much technological knowledge.

Additionally, social influence asserted that indeed students were motivated to use ChatGPT as a result of peer influence, curiosity, and social media. The technical infrastructure of ChatGPT influenced some students to upgrade their subscription to have a better learning experience which confirms the influence of facilitating conditions and finally the student were fairly happy with their experience of using ChatGPT but the level of satisfaction was different if they were using the unpaid version. The following section involves situating the findings within the existing literature. It is important to view how this study contributes or give nuanced aspects that are yet to be recognized when it comes to the impact of artificial intelligence tools like ChatGPT in education and its stakeholders like students, teachers and institutions.

RQ 1: How is ChatGPT used by university students to assist in their academic work?

Research question one's findings indicate that students use ChatGPT for

academic research and writing tasks. This aligns closely with the literature, from Bommarito & Katz (2022); Dowling & Lucey (2023) which highlights ChatGPT's capabilities in these areas. For instance, participants reported using ChatGPT to locate and summarize academic literature, synthesize information from multiple sources, and assist in various stages of the writing process. Participants emphasized ChatGPT's role in helping them understand complex concepts and new terminology, particularly in unfamiliar fields of study. This user case is well-documented in the contributions of Zhai, 2022, which notes ChatGPT's ability to explain difficult concepts and provide language assistance, especially for non-native English speakers. The findings reveal that students use ChatGPT for guidance in brainstorming, structuring papers, and expanding key ideas. This aligns with literature describing ChatGPT as a tool for providing mentorship and assistance in various aspects of academic work (Dowling&Lucey, 2023). The detailed examples of how ChatGPT is used for academic tasks can help fellow students understand and implement these uses, making ChatGPT more accessible and practical for their own academic work.

RQ 2: What are the potential impacts of ChatGPT use for students?

The findings from the second research question aligns with the literature on limitations of ChatGPT. One key challenge of its limited and inaccurate information contributes to the studies conducted by Tung (2022) stating that even though the tool produces relatively convincing texts it might sometimes be inaccurate and Susnjak (2022) supports it by confirming that ChatGPT's creativity and originality are undermined by the trained data which gives responses based on patterns it is familiar with leading to repetitive and shallow output. The findings from the second research question highlights the critical limitations of ChatGPT further proving that students' critical thinking and analytical skills are more valuable than what ChatGPT can offer. They should be aware that even though ChatGPT can assist in their academic work it is not substitute for their intellectual efforts. Therefore they should use ChatGPT as a supplementary tool, working alongside it rather than relying on it entirely.

RQ3: What are the perceived benefits of using ChatGPT?

The research findings also highlight the advantages of using AI tools particularly ChatGPT in academics. For instance, its ability to save time doing redundant tasks creates efficiency and allows the students to focus on other

aspects of learning. This aligns seamlessly with literature on benefits of ChatGPT use highlighting the efficiency when conducting automated conversations and the speed in responding to user questions which saves time and resources while enhancing productivity. Additionally, studies from (Deng&Lin, 2022) corroborates the findings that ChatGPT is valuable for its ability to offer personalized learning to students according to their needs and preferences. Its 24/7 availability is especially important as students can access it at any point of need. The significance of this research question lies in the fact that AI is not here to take over human roles but to support and enhance them. By reducing the overall workload of students and even teachers, ChatGPT allows them to focus on more impactful and creative ways of learning and teaching, hence having a better educational experience and outcome.

RQ 4: How can institutions support students to utilize ChatGPT?

The integration of ChatGPT into higher education settings has sparked considerable interest and debate within the academic community. The findings from the participants indicate a need for institutions to come up with strategies that can seamlessly integrate ChatGPT into the education sector. To begin with, institutions could curb the unethical use of AI by creating awareness on the proper ways of using the tool. This contributes to the several studies highlighting the challenges of using experienced when using ChatGPT. Additionally, training and integration of ChatGPT into curriculum may increase the quality of writing produced by students and promote user engagement and communication in classrooms (Azaria, 2022). These findings are preparing institutions and students not just for now but for the future. As technology continues to evolve being skilled at using AI will be important. Institutions that integrate these tools into their educational strategies are better positioned to provide relevant and up to date education ensuring their students are well prepared for the advanced technological landscape of the future.

RQ 5: How does the Unified theory of acceptance and use of technology influence students?

The findings from this study align well with the Unified Theory of Acceptance and Use of Technology (UTAUT) framework. The UTAUT model, which incorporates several pre-existing models of information technology acceptance, provides a comprehensive lens to analyze students' motivations,

perceptions, challenges, and satisfaction when integrating ChatGPT into their academic work. The study's results correspond to the core constructs of UTAUT, including performance expectancy, effort expectancy, social influence, and facilitating conditions, as well as the additional construct of hedonic motivation from UTAUT2.

Performance expectancy plays a significant role in students' adoption of ChatGPT for academic purposes. It was consistent with previous studies by Venkatesh et al. (2012) students perceived ChatGPT as a valuable tool that enhances their productivity and efficiency in managing their academic workload. The convenience of ChatGPT's instant responses and its ability to provide readily available information have been particularly appreciated by students with busy schedules. However, it is important to note that while ChatGPT is seen as a helpful resource, students recognize that it cannot entirely replace traditional classroom learning.

The effort expectancy associated with using ChatGPT is generally perceived positively by students. The findings by Khechine et al., (2020) are highlighted as the students find the tool easy to use, with a user-friendly interface that does not require extensive technological knowledge. This ease of use is particularly relevant in the current digital era, where students are already familiar with various technological tools. Moreover, the simplicity and accessibility of ChatGPT allow users to interact with it effortlessly, even if they are new to the platform.

Social influence plays a crucial role in motivating students to use ChatGPT. Peers, lecturers, curiosity, and social media platforms significantly impact students' decisions to engage with the AI tool (Venkatesh et al, 2003). The viral nature of ChatGPT on social media platforms like TikTok has contributed to its widespread adoption among students. Additionally, recommendations from supervisors and the general hype surrounding the tool have further encouraged students to explore its capabilities.

The facilitating conditions for using ChatGPT include access to both free and paid versions of the tool. Students who have access to the paid version (GPT-4.0) report higher satisfaction due to its additional features and improved functionality this is supported by Venkatesh et al., (2003). The paid version offers benefits such as more precise answers, internet connectivity for up-to-

date information, and the ability to upload files. These enhanced features contribute to a more efficient and satisfying user experience for students who opt for the premium version.

Students' hedonic motivation, or the pleasure derived from using ChatGPT, varies among users (Venkatesh et al., 2012). While some students express high levels of satisfaction with the tool, others acknowledge room for improvement. Those with access to the paid version tend to report higher satisfaction levels, citing benefits such as ease of use, faster completion of tasks, and a more structured approach to their academic work. However, some users point out limitations, such as outdated information and the need for further improvements in certain areas. The findings of UTAUT are significant as it gives a comprehensive understanding of the factors driving ChatGPT adoption among university students. This can enable institutions to come up with strategies to encourage positive technology adoption ensuring that students utilize AI to their full potential.

7. Research Findings with UTAUT Constructs

The key findings highlighted that students perceived ChatGPT as a means to increase their productivity and make their academic work easier. This aligns well with the construct of performance expectancy as students believed using the AI tool made their work better and even increased their confidence when handing in papers they had written. Secondly, students found ChatGPT easy to use and accessible without requiring technological expertise. This confirms that effort expectancy is a key factor in technology acceptance. The findings corroborate this by indicating ease of use was a positive factor contributing to the adoption of ChatGPT among students. Thirdly the findings indicate that external factors like peer influence played a significant role in encouraging students to adopt ChatGPT. Lastly the upgraded subscriptions which is a technical support facilitated more positive experiences with ChatGPT.

On the other hand, there were deviations within the findings such as the concerns and challenges associated with cognitive and abilities. While UTAUT focuses on factors influencing adoption the study highlights drawbacks that could hinder technological adoption. Therefore applicability of this framework is limited when it comes to the challenges and concerns. Additionally, the

findings underscore the importance of institutional support which is not among highlighted in the framework as it mainly focused on the user adoption.

7.1 Implications of Findings

Now looking at the research findings altogether, the research on ChatGPT usage among university students has significant implications for educational practices, affecting students, teachers, and institutions alike. This study provides a foundation for reimagining traditional teaching methods and learning environments in the age of artificial intelligence (Adıgüzel, et al., 2023). The integration of AI tools like ChatGPT in academic settings presents both opportunities and challenges that require careful navigation. This section will explore three primary areas where institutions can use this study to reevaluate their practices:

- Reevaluation of Academic Integrity Policies
- Reevaluation of Pedagogical Practices
- Reevaluation of Core Literacies

By addressing these key areas, the potential of AI can be harnessed while mitigating associated risks and challenges,

Reevaluation of Academic Integrity Policies

First, the widespread use of ChatGPT among students necessitates a reevaluation of academic integrity policies (Sullivan et al., 2023). Traditional notions of plagiarism and cheating need to be reconsidered in light of AI-assisted work. Institutions will need to develop clear guidelines on the appropriate use of AI tools in academic assignments and assessments. As shown in the study when Barry mentioned, “*The universities should come up with policies that allow a certain level of ChatGPT in terms of assisting as a guide and nothing more*” we see that not having clear policies poses a risk to academic integrity on the current educational practices. Reevaluation of current practices might involve creating new forms of evaluation that emphasize critical thinking, creativity, and the application of knowledge rather than mere information recall (Susnjak, 2022).

Reevaluation of Pedagogical Practices

ChatGPT's ability to provide personalized explanations and support provides new possibilities for individualized learning experiences. As shown in the study when, Rimi mentioned, *“However, there was also a very large majority of students who were relying on the fact that ChatGPT offered personalized feedback and individual learning. And that's very helpful as a student because I know I can learn 24/7 and receive feedback 24/7”*. This technology could potentially address the diverse learning needs of students, offering tailored assistance that complements classroom instruction (Adeshola & Adepoju, 2023). However, it also raises concerns about over-reliance on AI and the potential erosion of human-to-human interactions in the learning process. Striking a balance between AI-assisted learning and traditional pedagogical approaches will be crucial.

Furthermore, the adoption of ChatGPT and similar AI tools in education has significant implications for institutions especially teachers. They will need to adapt their teaching methods and assessment strategies to effectively incorporate these technologies into their courses. This may require extensive professional development programs to ensure faculty members are equipped to guide students in the ethical and effective use of AI tools while maintaining high academic standards.

Reevaluation of Core Literacies

The integration of AI tools like ChatGPT in education aligns with the growing importance of digital literacy and AI competency in the workforce. By familiarizing students with these technologies, educational institutions can better prepare them for future careers where AI will likely play a significant role (Božić & Poola, 2023). This implies a need for curriculum updates that incorporate AI literacy and ethics, ensuring students are equipped to navigate the complexities of an AI-driven world. The findings underscore the importance of addressing ethical considerations surrounding AI use in education. Institutions must develop frameworks for the responsible integration of AI tools, ensuring that their use aligns with academic values and promotes genuine learning. This includes educating students about the limitations and potential biases of AI systems, as well as fostering a sense of responsibility in their use of these technologies (Rudolph et al., 2023). Furthermore, these literacies are

particularly important to create a more even educational experience. ChatGPT has the potential to enhance accessibility in education, particularly for students with learning disabilities or those who face language barriers. However, it also raises concerns about equity, as access to and proficiency with AI tools may vary among students.

Educational institutions will need to consider how to ensure equal access and support for all students in an AI-enhanced learning environment. The findings from this study highlight the need for ongoing research and policy development in the field of AI in education. As the technology continues to evolve, our understanding of its impact on learning outcomes, academic integrity, and pedagogical practices must also develop (Deng & Lin, 2022). This implies a need for continued investment in research and the development of adaptive policies that can keep up with technological advancements.

8. Recommendations for Institutions

Higher education reactions of ChatGPT are stretched apart between banning and prohibiting the use of the software to integrating it into the curricula. In accordance with the findings of this study, it is possible to offer some significant recommendations to stakeholders. In the context of AI utilization in education, these stakeholders include educators, policymakers, researchers, educational strategists, and administrators. The recommendations are as follows:

- Educational institutions should implement comprehensive training programs for both students and faculties. These programs should focus on the ethical, effective, and responsible use of AI tools like ChatGPT. By providing proper guidance, institutions can help mitigate potential challenges related to academic integrity and ensure that students understand how to leverage AI tools to enhance their learning experience without compromising their cognitive development.
- Universities need to develop clear and adaptive policies that address the challenges and implications of AI integration in academic settings. These policies should cover areas such as academic integrity, data privacy, and appropriate use of AI tools in coursework and assessments. By establishing clear guidelines, institutions can create a framework that promotes responsible AI use while maintaining academic standards.

- Dedicated support resources should be established to assist students in navigating the use of ChatGPT for academic purposes. These resources could include workshops, online tutorials, and detailed guidelines on effective prompting techniques and responsible AI use. Such support can help students overcome challenges related to crafting effective prompts and ensure they use the tool as a supplement to their learning rather than a substitute for critical thinking.
- Educational institutions should consider integrating AI literacy into their curricula across various disciplines. This integration can help students develop skills in critical evaluation of AI-generated content, understand the limitations of AI tools, and learn how to use them effectively as part of their academic toolkit. By embedding AI education into the curriculum, universities can prepare students for a future where AI will play an increasingly significant role in various professions.
- Universities should formulate comprehensive guidelines for the ethical use of AI tools in academia. These guidelines should emphasize the importance of maintaining academic integrity, respecting intellectual property rights, and using AI tools to enhance rather than replace critical thinking and creativity. Clear ethical guidelines can help students navigate the complexities of AI use in academic settings.
- Professional development opportunities should be provided for faculty members to increase their AI literacy and adapt their teaching methods. This can include training on how to effectively incorporate AI tools into course design, assessment strategies, and classroom activities. By equipping educators with the necessary skills and knowledge, institutions can ensure that AI integration enhances rather than disrupts the learning process.
- Universities should encourage and fund ongoing research to assess the long-term impacts of ChatGPT and similar AI tools on learning outcomes, critical thinking skills, and academic performance. This research can provide valuable insights for refining policies, improving integration strategies, and addressing emerging challenges in AI-enhanced education.

8.1 Recommendations for Students

Students of today are perceived to be digital natives who use technology more effortlessly and intuitively than their teachers. The recommendations for students are to work on both their strengths and weaknesses further while utilizing AI tools: The students need to be aware of academic integrity policies and understand the consequences of academic misconduct; they should take the initiative to find out about the different policies that have been put in place to ensure they are not crossing the line. In today's world digital literacy is highly valued, students are expected to keep up with the technological advancements as employers require people with a technological skillset. According to Zhai (2022) they need to be digitally literate, master AI tools to increase their chances of employment.

When it comes to writing assignments, students should not view it as a means to an end as this can impact their ability to think independently or even come up with good quality work. ChatGPT and other AI tools are good but do not compare to the human mind therefore, combining the efforts of both human and AI can improve writing skills and generate new ideas rather than simply copying and pasting. ChatGPT has been said to generate fake references it is important to use this tool alongside others like Google to confirm that you are using high-quality sources to ensure your work has accurate information. ChatGPT should act as a guide, therefore read widely to expand on the ideas it generates to improve critical and creative thinking; additionally you can learn new skills such as writing and debugging code; and lastly practice the use of AI language tools like ChatGPT to solve real-world problems (Zhai, 2022)

9. Conclusion

The integration of artificial intelligence in education, particularly through tools like ChatGPT, has ushered in a new era of learning and academic support for university students. This comprehensive study, grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), delves into the multifaceted experiences of students in Kenya and the Netherlands as they navigate the use of ChatGPT in their academic pursuits.

ChatGPT has rapidly become a valuable tool for many students, offering a wide array of benefits that enhance their academic journey. It serves as a valuable resource for academic research, providing efficient literature searches, idea expansion, and paper structuring assistance. Students find it particularly useful for writing and editing tasks, from essay composition to grammar checking. Moreover, ChatGPT's ability to offer personalized learning experiences and real-time feedback has revolutionized the way students approach their studies, making it a cost-effective academic support system.

However, the adoption of ChatGPT in academic settings is not without its challenges. Students reported concerns about the tool's impact on creativity and critical thinking skills, fearing an overreliance might lead to reduced autonomy in learning. There's also a perceived stigma associated with its use, as some view it as a shortcut or a form of academic dishonesty. Accuracy issues, especially with recent information, and the tool's limitations in contextual understanding pose additional hurdles. These challenges raise important questions about academic integrity and the nature of knowledge acquisition in the AI age.

The widespread use of ChatGPT has prompted a re-evaluation of traditional teaching methods and assessment practices. Educators now face the task of adapting their approaches to ensure that students develop critical thinking skills while leveraging AI tools effectively. This shift necessitates a focus on teaching students how to use AI as a complement to their learning rather than a replacement for independent thought.

To address these challenges and maximize the benefits of ChatGPT, the study emphasizes the need for comprehensive institutional support. Universities are encouraged to develop clear guidelines for the ethical use of AI tools, implement training programs for both students and faculty, and integrate AI

literacy into curricula. This proactive approach can help mitigate concerns about academic integrity while preparing students for an increasingly AI-driven workforce.

Looking ahead, the study calls for ongoing research to assess the long-term impacts of AI tools on learning outcomes and academic practices. Longitudinal studies focusing on ChatGPT's influence on critical thinking skills and academic performance are crucial. Additionally, exploring its potential in personalized learning and its implications for students with diverse needs could unlock new avenues for inclusive education. As AI continues to evolve and integrate into higher education, the landscape of learning is undoubtedly changing. This study marks a significant step in understanding the complex relationship between AI tools like ChatGPT and university education. It underscores the transformative potential of AI while highlighting the need for careful navigation of its challenges. By fostering a balanced approach that embraces technological advancements while preserving the essence of critical thinking and independent learning, universities can ensure that students are well-equipped for the future. The journey of integrating AI in education is ongoing, requiring continuous adaptation, research, and policy development to create equitable, ethical, and effective learning experiences for all students.

References

- Adams, W. C. (2015). Conducting semi-structured interviews. *Handbook of practical program evaluation*, 492-505.
- Adeshola, I., & Adepoju, A. P. (2023). The opportunities and challenges of ChatGPT in education. *Interactive Learning Environments*, 1–14.
<https://doi.org/10.1080/10494820.2023.2253858>
- Adigüzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of ChatGPT. *Contemporary Educational Technology*.
- Alshenqeeti, H. (2014). Interviewing as a data collection method: A critical review. *English linguistics research*, 3(1), 39-45.
- Azaria, A. (2022). ChatGPT usage and limitations.
- Bommarito II, M., & Katz, D. M. (2022). GPT takes the bar exam. *arXiv preprint arXiv:2212.14402*.
- Božić, V., & Poola, I. (2023). ChatGPT and education. *Preprint*.
- Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57–71). American Psychological Association.
<https://doi.org/10.1037/13620-004>
- Brown, T., Mann, B., Ryder, N., Subbiah, M., Kaplan, J. D., Dhariwal, P., ... & Amodei, D. (2020). Language models are few-shot learners. *Advances in neural information processing systems*, 33, 1877-1901.
- Caulfield, J. (2022, November 25). How to do thematic analysis. Scribbr.

- Chandler, R., Anstey, E. H., & Ross, H. (2015). Listening to voices and visualizing data in qualitative research. *SAGE Open*, 5(2), 215824401559216. <https://doi.org/10.1177/2158244015592166>
- Deng, J., & Lin, Y. (2022). The benefits and challenges of ChatGPT: An overview. *Frontiers in Computing and Intelligent Systems*, 2(2), 81-83.
- Dowling, M., & Lucey, B. (2023). ChatGPT for (finance) research: The Bananarama conjecture. *Finance Research Letters*, 53, 103662.
- Earl, L. M. (2012). *Assessment as learning: Using classroom assessment to maximize student learning*. Corwin Press.
- Firat, M. (2023). What ChatGPT means for universities: Perceptions of scholars and students. *Journal of Applied Learning and Teaching*, 6(1).
- García-Peñalvo, F. J. (2023). The perception of Artificial Intelligence in educational contexts after the launch of ChatGPT: Disruption or panic? *Education in the Knowledge society*, 24, 1-9. <https://doi.org/10.14201/eks.31279>
- Grimaldi, G., & Ehrler, B. (2023). AI et al.: Machines are about to change scientific publishing forever. *ACS energy letters*, 8(1), 878-880.
- Guo, B., Zhang, X., Wang, Z., Jiang, M., Nie, J., Ding, Y., ... & Wu, Y. (2023). How close is chatgpt to human experts? comparison corpus, evaluation, and detection. *arXiv preprint arXiv:2301.07597*.
- Helm, J. M., Swiergosz, A. M., Haeberle, H. S., Karnuta, J. M., Schaffer, J. L., Krebs, V. E., ... & Ramkumar, P. N. (2020). Machine learning and artificial intelligence: definitions, applications, and future directions. *Current reviews in musculoskeletal medicine*, 13, 69-76.

- Hesse, B. (2005). The craft of qualitative research. In *A Holistic Approach* (p. 3). https://www.sagepub.com/sites/default/files/upm-binaries/6196_Chapter_1__Hesse_Biber_I_Proof.pdf
<https://www.scribbr.com/methodology/thematic-analysis>
- Hutson, M. (2022). Could AI help you to write your next paper?. *Nature*, *611*(7934), 192-193.
- Jiao, W., Wang, W., Huang, J. T., Wang, X., & Tu, Z. (2023). Is ChatGPT a good translator? A preliminary study. *arXiv preprint arXiv:2301.08745*, *1*(10).
- Kallio, H., Pietilä, A., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, *72*(12), 2954–2965. <https://doi.org/10.1111/jan.13031>
- Khechine, H., Raymond, B., & Augier, M. (2020). The adoption of a social learning system: Intrinsic value in the UTAUT model. *British Journal of Educational Technology*, *51*(6), 2306-2325.
- Kung, T. H., Cheatham, M., Medenilla, A., Sillos, C., De Leon, L., Elepaño, C., ... & Tseng, V. (2023). Performance of ChatGPT on USMLE: Potential for AI-assisted medical education using large language models. *PLoS digital health*, *2*(2), e0000198.
- Lan, D. H. (2023). Analyzing the impact of Chat-GPT usage by university students in Vietnam. *migrationletters.com*.
<https://doi.org/10.59670/ml.v20iS10.5134>
- McMurtrie, B. (2022, December 13). AI and the future of undergraduate writing. *The Chronicle of Higher*

Education.<https://www.chronicle.com/article/ai-and-the-future-of-undergraduate>

Metz, C., & Weise, K. (2023). Microsoft bets big on the creator of ChatGPT in race to dominate AI. *The New York Times*, 12.

Mills, A. (2023). How do we prevent learning loss due to AI text generators. *Blog post*.

Ngo, T. T. A. (2023). The perception by university students of the use of CHATGPT in education. *International Journal of Emerging Technologies in Learning (Ijet)*, 18(17), 4–19.

<https://doi.org/10.3991/ijet.v18i17.39019>

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1609406917733847.

Ortiz, S. (2023). What is ChatGPT and why does it matter. *ZDNET Tech*, 355. *Program Evaluation*, 1(4), 492–505.

<https://doi.org/10.1002/9781119171386.ch19>

Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. *Journal of Applied Learning and Teaching*, 6(1), 342-363.

Sandelowski, M. (2001). Real qualitative researchers do not count: The use of numbers in qualitative research. *Research in Nursing & Health*, 24(3), 230–240. <https://doi.org/10.1002/nur.1025>

Saunders, C., Sierpe, A., Von Plessen, C., Kennedy, A., Leviton, L. C., Bernstein, S. L., Goldwag, J. L., King, J. R., Marx, C., Pogue, J. A., Saunders, R., Van Citters, A. D., Yen, R. W., Elwyn, G., & Leyenaar, J. K. (2023). Practical thematic analysis: A guide for multidisciplinary

- health services research teams engaging in qualitative analysis. *BMJ*, e074256. <https://doi.org/10.1136/bmj-2022-074256>
- Srivastava, P., & Hopwood, N. (2009). A practical iterative framework for qualitative data analysis. *International Journal of Qualitative Methods*, 8(1), 76-84.
- Strzelecki, A. (2023). Students' Acceptance of ChatGPT in Higher Education: An Extended Unified Theory of Acceptance and Use of Technology. *Innovative Higher Education*. <https://doi.org/10.1007/s10755-023-09686-1>
- Sullivan, M., Kelly, A., & McLaughlan, P. (2023). ChatGPT in higher education: Considerations for academic integrity and student learning.
- Susnjak, T. (2022). ChatGPT: The end of online exam integrity?. *arXiv preprint arXiv:2212.09292*.
- Sutton, M. J., & Allen, K. (2019). *Emotify!: The power of the human element in game-based learning, serious games, and experiential education*. EI Games LLC.
- Tung, L. (2022). Stack overflow temporarily bans answers from OpenAI's ChatGPT chatbot. ZDNET.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.
- Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS quarterly*, 157-178.
- Vincent, J. (2022). AI-generated answers temporarily banned on coding Q&A site Stack Overflow. *The Verge*, 5.

- Warner, J. (2022, December 5). *Freaking out about ChatGPT—Part I*. Inside Higher Ed | Higher Education News, Events and Jobs.
<https://www.insidehighered.com/blogs/just-visiting/freaking-out-about-chatgpt%E2%80%94part-i>
- Wiliam, D. (2011). What is assessment for learning?. *Studies in educational evaluation*, 37(1), 3-14.
- Williams, M. D., Rana, N. P., & Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology (UTAUT): A literature review. *Journal of Enterprise Information Management*, 28(3), 443–488.
<https://doi.org/10.1108/jeim-09-2014-0088>
- Writing.
- Xu, X., Chen, Y., & Miao, J. (2024). Opportunities, challenges, and future directions of large language models, including ChatGPT in medical education: a systematic scoping review. *Journal of Educational Evaluation for Health Professions*, 21, 6.
<https://doi.org/10.3352/jeehp.2024.21.6>
- Zhai, X. (2022). ChatGPT User Experience: Implications for Education. *Social Science Research Network*. <https://doi.org/10.2139/ssrn.4312418>

Appendices

Appendix A: Interview questions

Interview Guide:

Motivations for using ChatGPT

- What initially motivated you to start using ChatGPT?
- Do you feel ChatGPT fulfills your academic goals?
- Have your reasons for using ChatGPT changed over time?
- What factors influence your decision to continue using ChatGPT for assignments?

Perceptions of ChatGPT use in Education

- How would you describe your overall experience with using ChatGPT for academic assignments?
- What Tasks and Challenges do you use ChatGPT for?
- In what ways do you think ChatGPT has impacted your academic performance or productivity?
- How do you balance using ChatGPT with other sources of information?

Challenges Encountered

- What are some of the challenges you have experienced when using ChatGPT to complete assignments?
- How do you overcome these challenges?
- Are there any recurring issues that you constantly encounter when using ChatGPT?
- Have you sought assistance from peers to address these challenges?

Solutions for overcoming challenges

- What can be done to address the challenges experienced with ChatGPT?
- Do you personally have a technique to mitigate the challenges experienced?

- Are there any existing resources, tools or support services that you find helpful alongside ChatGPT?
- How can educators or institutions better support students in overcoming challenges related to ChatGPT usage.

Overall satisfaction with ChatGPT

- On a scale of 1-10, how satisfied are you with using ChatGPT for your academic assignments?
- What aspects of ChatGPT do you find most helpful?
- How does your satisfaction compare to you initial impression of the tool?
- Are there any features that could be added to enhance your satisfaction level?

Appendix B: consent form

CONSENT REQUEST FOR PARTICIPATING IN RESEARCH

FOR QUESTIONS ABOUT THE STUDY, CONTACT:

Angeline Nicole Akinyi, EUR student email address:676855aa@eur.nl

DESCRIPTION

You are invited to participate in a research about examining the use of Chat GPT by university students. The purpose of the study is to understand How Chat GPT is being used by university students to assist in academic work and the potential implications it has when used in academic settings.

Your acceptance to participate in this study means that you accept to be interviewed. In general terms,

- In the case of interviews, my questions will be related to motivations behind using Chat Gpt, perceptions of Chat Gpt in education, challenges encountered, overall satisfaction, and suggestions for enhancing ChatGPT integration in Education etc.

Unless you prefer that no recordings are made, I will make an audio recording of the interview.

I will use the material from the interviews and my observations exclusively for academic work, such as further research, academic meetings, and publications.

RISKS AND BENEFITS

As far as I can tell, there are no risks associated with participating in this research. I will not use your name or other identifying information in the study. The participants in the study will only be referred to by pseudonyms, and in terms of general characteristics such as age and gender, etc.].

You are always free not to answer any particular question, and/or stop participating at any point.

TIME INVOLVEMENT

Your participation in this study will take 45-60 minutes. You may interrupt your participation at any time.

PAYMENTS

There will be no monetary compensation for your participation.

PARTICIPANTS' RIGHTS

If you have decided to accept to participate in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty. You have the right to refuse to answer particular questions. If you prefer, your identity will be made known in all written data resulting from the study. Otherwise, your privacy will be maintained in all published and written data resulting from the study.

CONTACTS AND QUESTIONS

If you have questions about your rights as a study participant or are dissatisfied at any time with any aspect of this study, you may contact – anonymously, if you wish- the ESHCC faculty.

SIGNING THE CONSENT FORM

If you sign this consent form, your signature will be the only documentation of your identity. Thus, you **DO NOT NEED** to sign this form. In order to minimize risks and protect your identity, you may prefer to consent orally. Your oral consent is sufficient.

I give consent to be recorded during this study:

Name

Signature

Date

I prefer my identity to be revealed in all written data resulting from this study

Name

Signature

Date

This copy of the consent form is for you to keep.

Appendix C: Recruitment Post

Hey everyone, my name is Nicole a master student at Erasmus University, I'm currently conducting a research to examine how University Students Use Chat Gpt in their Academics. I need 10 students from any course who use Chat Gpt frequently. Kindly assist me in finishing this final lap of my thesis. As I am pressed on time, I need participants ASAP. You can reach out to me via my email address at anginicole6@gmail.com to plan for an online or physical meeting if you are in the Netherlands. Thank you in advance.