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# ChatGPT and Its Impact on Students Assessment Practices in the Higher Educational Sector: A Systematic Review

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***Abstract***

**Background:** The proliferation of Artificial Intelligence (AI) tools such as ChatGPT is growing at a rapid pace, sparing no sector. One of the AI tools that has grown in it use across the sectors is the use of ChatGPT, a tool that mimics human like capabilities of producing ideas. However, there have been many concerns about how ChatGPT will change the higher education institutions. More worrisome is how it poses risks that compromise the integrity of academic outputs if left unregulated
**Objective:** This study examines the influence of ChatGPT on students' assessment practices in the higher educational sector
**Methods:** The study carried out a systematic literature review by gathering data from peer reviewed academic papers. Initially, 140 research papers were identified. Thereafter, these papers went through further filtering, and 35 usable papers were selected and included in the study
**Results:** This study highlighted the importance of using AI tools such as ChatGPT in the higher education sector, underscoring its advantages and the threats that it poses to the sector if the use remains unregulated. The study has recommended institutional policies about the use of AI tools that must be put in place to guide academic staff, researchers and learners in the responsible use of ChatGPT for academic work.
**Conclusion:** While the widespread adoption of ChatGPT is undeniable, there is an urgent need for a well-balanced regulation regarding its use within Higher Education Institutions (HEIs). Thus, future research should focus on examining the existing policies and practices related to ChatGPT ethics, privacy, and security in education and identify gaps and areas for improvement.

***Keywords:*** ChatGPT, Artificial Intelligence, Chatbot, OpenAI, Higher Education

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## I. INTRODUCTION

ChatGPT was developed in late 2022 as an advanced AI tool that has garnered remarkable popularity globally [1]. While the "GPT" in ChatGPT refers to Generative Pre-trained Transformer, the "Chat" is designed to generate human-like text and simulate conversation [1]. ChatGPT is an AI tool built to understands and provide feedback to language input in an interactive way [2]. Its capabilities range from generating text and writing code to simulating characters in a story [3]. With these capabilities, several fields such as healthcare [4], library services [5], and Education [6] are embracing it.

In the educational environment, ChatGPT has brought tremendous benefits which is being harnessed by both learners and teachers [2]. For example, students' engagement is enhanced through the natural language interface embedded in ChatGPT as it promotes an interactive learning experience [6]. This potential capability of ChatGPT in enhancing students' learning experience has attracted significant attention particularly in higher educational institutions [3]. According to Lozano and Blanco Fontao [7] ChatGPT can improve communication quality and writing skills among higher education students . Furthermore, it offers real-time responses and aids in understanding complex concepts, making it a valuable teaching tool [3].

However, despite its impressive capabilities in the educational sector, ChatGPT also faces several challenges. One significant concern is the potential for biased outputs, as it may inadvertently replicate biases in its training data [1]. Additionally, the model may sometimes generate incorrect or nonsensical responses, especially when presented with

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ambiguous or novel queries which may mislead students if they treat it as an authoritative source [3]. Such inaccuracies could lead to misinformation, impacting students' academic performance and misconceptions about key concepts.

Another significant issue is the risk of academic dishonesty [8]. While cheating in academia is not new, using AI-generated text such as ChatGPT to cheat on assignments presents unique challenges [8]. For example, when students rely solely on AI for assignments, they risk losing important educational skills, such as writing, researching, analyzing, and self-learning [8]. These skills are crucial not only in education but also in future professional environments. In addition, with the use of AI in generating content, students may lose the motivation to engage deeply with course materials [9]. Over time, this could lead to lower retention of knowledge and reduced academic performance, as students miss out on the learning process that involves critical thinking, practice, and comprehension [8].

The ethical concerns surrounding ChatGPT are also a point of contention [9]. One major ethical dilemma is its potential to undermine academic integrity, especially when it comes to writing scientific papers [9]. According to Vaccino-Salvadore [10], there is growing concern within the educational sector about how the widespread use of AI such as ChatGPT could compromise academic standards. While ethical considerations are necessary to ensure that ChatGPT benefit students and educators, they must also avoid negative consequences [11].

The impact of ChatGPT on student assessment practices, particularly in higher education, remains underexplored [11]. Given that higher education institutions are at the forefront of technological adoption, they provide a critical context for investigating the benefits and challenges of AI tools such as ChatGPT in teaching, learning, and research [8]. This study aims to fill this gap by examining how ChatGPT influences assessment practices in the higher education sector, a domain where AI tools are rapidly gaining traction.

Hence, this study systematically reviewed relevant academic literature to provide insights into how ChatGPT can be used effectively to benefit students while addressing potential drawbacks. This study chose an SLR because it provides a structured, in-depth examination of existing research, offering a broad and detailed view on the impact of ChatGPT on student assessment practices in the higher educational sector.

## II. Literature Review

### *A. ChatGPT in Education*

In recent years, there has been a noticeable increase in the use of AI technologies in academic settings [12]. Among these AI technologies is ChatGPT. ChatGPT, operate as web-based platforms that adapt to the behaviors of both learners and instructor, thereby enriching the educational experience [13]. It has the potential to revolutionize research and education by automating routine tasks, assisting with data analysis, and introducing new methods of learning and assessment [1]. However, its adoption in the higher educational institutions varies [14].

For example, Yan [15] portray ChatGPT as a powerful tool that has exerted positive impact in terms of language acquisition and support to learners. In addition, several studies have examined how ChatGPT's have helped in personalizing educational content by tailoring it to students learning experiences [9], [13], [16]. ChatGPT aids intelligent tutoring and automatic scoring [9], helps in creating educational content [17], and support diverse learning needs by enabling accessibility [14]. Furthermore, it is user-friendly due to its ability in assisting students and tutors with understanding and confidence in navigating the ever-evolving world of technology [13].

### *B. Related Secondary Studies*

A review of existing literature has been undertaken to explore the possible impact of ChatGPT on students' assessment practices in the higher educational sector. Each of these studies was conducted separately, focusing on different topics, as detailed in Table 1.

Gocen and Aydemir [18] explored the possible scenarios with the arrival of AI in Education and the implications for the future of schools. A qualitative research approach was employed to investigate participants' perspectives from various sectors. The findings indicate that higher education institutions and teachers will have opportunities and challenges with the arrival of AI. The results offer recommendations for the effective utilization of AI and strategies to mitigate potential issues. Although participants predominantly express positive views towards AI, concerns regarding the future of education have also been emphasized, particularly from teachers and academics. It is essential to note that this study did not address the long-term impact of AI on students' learning outcomes

Similarly, Ali, et al. [19] investigate the implications of using ChatGPT for teaching and learning. The study analyzes 112 scholarly articles to identify the potential benefits and challenges of ChatGPT use in educational settings. The findings reveal ChatGPT's capabilities in natural language processing, text generation, and performance evaluation, which offer significant opportunities to enhance the educational experience. However, there are concerns about the quality and bias of ChatGPT's responses, plagiarism, and content authenticity that the study did not adequately address.

Azaria [20] investigates an intriguing bias in ChatGPT regarding using digits in numbers. The findings reveal a significant relationship between the frequency of digits produced by ChatGPT and peoples' favourite numbers. Moreover, the study highlights some advantages and limitations of ChatGPT being developed as a conversational agent. However, while the study reveals a surprising bias in ChatGPT as it relates to the use of digits in numbers, it did not address data privacy and plagiarism, which are issues in education. [21]

Adeshola and Adepoju [8] study examined the VADER (Valence Aware Dictionary for Sentiment Reasoning) sentiment scores on tweets that are only English. The sentiment scores for each tweet were calculated, thereafter the data was separated into three categories: good, negative, and neutral. The findings revealed that 2013 tweets were categorized as "positive," with the remaining 804 and 1053 tweets categorized as "negative" and "neutral." The findings indicate that a significant number of people have positive things to say about ChatGPT. This implies that in the years to come, the use of ChatGPT will continue to increase and will not slow down. However, Adeshola and Adepoju [8] study only used data extracted from Twitter which is the general opinion of twitter audience and cannot be generalized.

Elbanna and Armstrong [22], examines the benefits of incorporating an emerging generative AI technology such as ChatGPT in education. The study findings reveal that with ChatGPT, learners' routine tasks can easily be automated provided it can be integrated into education, thus enhancing students learning experience. However, Elbanna and Armstrong [22] study only highlights the benefits of incorporating ChatGPT within the academic settings without considering the data privacy and security issues.

TABLE 1
RELATED STUDIES

| Reference | Goal | Concern with the research question |
|---|---|---|
| [18] | Exploring the possible scenarios that are there with the arrival of AI in Education and the implications for future of schools. | Long-term impact of AI on students' learning outcomes |
| [19] | Examines the implications of using ChatGPT for teaching and learning | Biases of ChatGPT's responses |
| [20] | Investigates an intriguing bias in ChatGPT as it relates to the use of digits in numbers | Overview of privacy and data security regarding the use of ChatGPT in academic environment |
| [8] | Exploring the VADER sentiment scores on tweets which is only English. | Overview of how ChatGPT impact on student cheating using twitter data.<br>Overview of 2013 tweets in the analysis. |
| [22] | Investigates the benefits of incorporating an emerging AI technology in academic environment. | Data privacy and security issues of integrating ChatGPT within the field of education |

## III. METHODS

This study conducted a systematic literature review (SLR) to examine the impact of ChatGPT on student assessment practices in higher education. A SLR employs organized approach to gather, evaluate, and interpret secondary data [23]. This method is systematic and repeatable, synthesizing data to answer a particular research question [24]. The SLR approach was chosen in gathering and analyzing data on the current evidence on ChatGPT. According to Stapic, et al. [25], there are guidelines for conducting SLR, which includes planning, conducting, and reporting the review (Fig. 1). This study followed these guidelines in addressing the study RQs and developed the review procedure (Figure 1). To enhance the transparency of the systematic review, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines are used as a reference[26] .

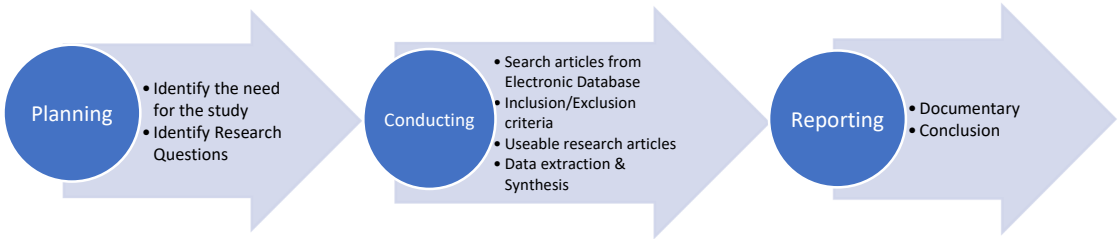


Fig. 1 Systematic Literature Review Procedure

### *A. Planning*

The first stage, which is the planning process involves establishing the need for the study and formulating research questions to steer the evaluation and criteria for selecting relevant publications. The review article aims to investigate the effect of ChatGPT on students' assessment practices in the higher educational sector. Accordingly, three research questions (R.Q.) were raised:

RQ1.What are the beneficial applications of ChatGPT in the higher educational sector?

RQ2. What are the impacts of using ChatGPT in the higher educational sector?

RQ3. What are the ethical issues surrounding the use of ChatGPT in the higher educational sector?

### *B. Conducting*

The second stage (conducting), the search strategy involved three databases such as Scopus, EBSCO and Google Scholar to identify relevant articles on topics like ChatGPT, AI, and chatbots. The reviewed papers were recent publications that were published from 2021 to 2024. Given the domain of the literature review, the subject area of our search was Computer science, Information systems, ICT, and multidisciplinary. Data extraction involved using keywords in titles and abstracts such as: ("ChatGPT" OR "Chatbot" AND "AI" OR "OpenAI"). "Quotation marks were used to separate each of the search terms. In addition to using this search string, further criteria were used to enhance the search outcomes to incorporate records that met the following conditions: (i) authored exclusively in English; and (ii) of all types, excluding Meeting Abstract, Data Paper, Book Review, and Letter. Articles were assessed and screened for eligibility using the above pre-specified eligibility search criteria (refer Table 2). Those that did not meet the criteria were excluded (refer Figure 2). The search led to the extraction of 140 research papers (Scopus=50. Google scholar=80 and EBSCO=10), of which 35 were found usable for analysis as shown in Figure 2.

TABLE 2
INCLUSION AND EXCLUSION CRITERIA

| Inclusion | Exclusion | Description |
|---|---|---|
| √ | | The focus of the publication is on the impact of ChatGPT on students' assessment practices in the higher educational sector. |
| √ | | The publication is written in English |
| √ | | The publication is published between 2021-2024 |
| | √ | The full text of the publication is not available |
| | √ | Publication that is duplicate or already retrieved from another database. |
| | √ | The publication is a review/survey paper, posters, extended abstract, article summaries, lecture notes and proposal. |

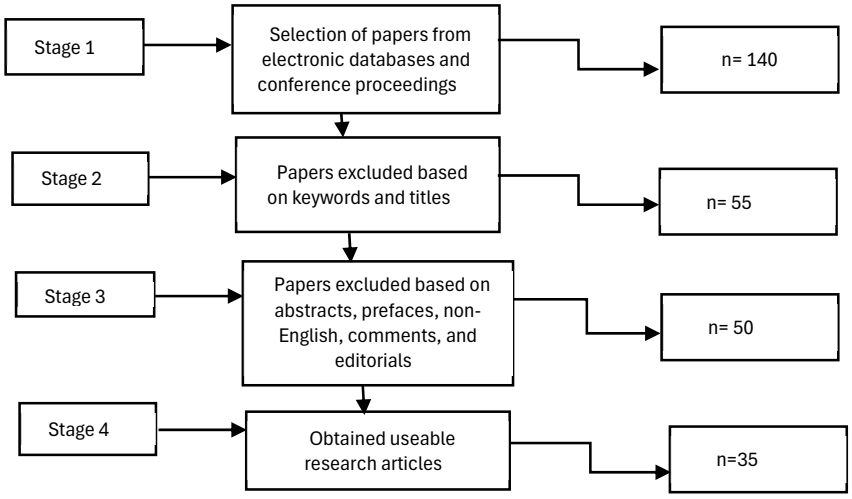


Fig. 2 Stages of selection

Figure 3 illustrates the yearly distribution of the reviewed research papers on ChatGPT. It highlights that a significant majority, 32 out of 35 papers (91.4%), were published in 2023. Additionally, 2.9% of the papers were published in each of the years 2021, 2022, and 2024.

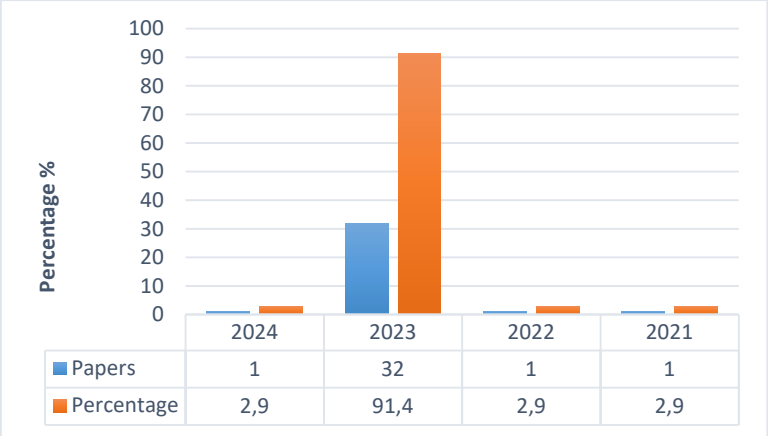


Fig. 3 Distribution of Research Papers per Year

For the quality assessment phase, the researchers evaluate the previously selected papers to ensure their relevance and quality for this study. This evaluation considers factors such as research objectives, prior study and literature indexes. Index identification is performed by referencing Scimago Journal & Country Ranks. The author employs an assessment scoring system ranging from 0 to 1, based on the criteria outlined in Table 3. A score of 0 indicates that the study does not meet the specified checklist criteria, a score of 0.5 means that the criteria are implicitly defined, and a score of 1 indicates strong alignment with the criteria. Based on the checklist criteria adapted from other studies, a minimum of 5 out of 8 score is needed for a paper to be selected for final consideration [27]. This minimum requirement is essential to ensure that the checklist standards are followed accordingly for each paper [28]. The reliability and validity of the study findings is enhanced by the scoring system, because it ensures the integrity of the research outcomes [29]. Ultimately, 35 papers were selected based on this assessment process.

TABLE 3
QUALITY ASSESSMENT CRITERIA

| Checklist | Question checklist |
|---|---|
| C1 | Was the purpose of the research explicitly stated in the article? |
| C2 | Were there related work from previous research to show the study's main contribution? |
| C3 | Was there a background stating the research context in the study? |
| C4 | Was there a literature review in the study? |
| C5 | Was there a conclusion that are relevant to the purpose of the research? |
| C6 | Were there outcomes from article? |
| C7 | Were there recommendations for future work that fit the SLR context? |
| C8 | Are the articles Scopus indexed(Q1/Q2/Q3/Q4/unindexed)? |

Moreover, in extracting data from the selected papers, two independent researchers were consulted to use the research questions (RQs). The extracted data was compared, and where there are inconsistencies, it was sorted out by mutual agreement. According to Mallett, et al. [24], "disparities in studies like this can be minimized by the researchers reviewing their codes to ensure consistency and relevance. The data were then synthesized based on the identified core themes. This thematic synthesis was crucial for examining the impact of ChatGPT on student assessment practices in higher education".

### *C. Reporting*

The findings were summarized and synthesized by answering each RQs based on the data collected. The PRISMA checklist was used as a guide in identifying and reporting key issues in the SLR [26]. This method helps in ensuring that the review outcomes are well structured, detailed and presentable. Also, the recommendations presented in the discussion section are based on the findings of this study and are also informed by previous studies.

## IV. RESULTS

The section presents the findings from the reviewed papers as it relates to ChatGPT's impact on student assessment practices in higher education.

TABLE 4
REVIEWED PAPERS ON BENEFICIAL APPLICATIONS OF CHATGPT IN HIGHER EDUCATIONAL SECTOR

| Reference | Aim/Objectives | Findings |
|---|---|---|
| [30] | To explore the potential and possible disruption of ChatGPT in online assessment. | This study revealed the potential benefits of ChatGPT in enhancing online student assessment. The study also notes the possibility of ChatGPT being used to cheat and plagiarize which can undermine academic integrity. |
| [31] | The study aims to investigate the potential of artificial intelligence chatbots in academic libraries | The study found that ChatGPT can provide timely feedback on reference inquiries and assist with research concept. |
| [32] | This study aimed to ascertain what factors influence the length of time undergraduates receive individual tutoring. | The results disclosed several significant statistics on the factors impacting the duration of personalized tutoring using ChatGPT |
| [33] | This study explored the advantages of integrating a new generative AI technology in education. It investigates the use of ChatGPT in personalized learning, research assistance, assessment and content creation | The study reveals that with ChatGPT student learning experience can be enhanced by automating routine task which ultimately increase their productivity. |
| [34] | This paper set out to test the accuracy of five AI content tools, to detect AI generated content in the responses generated by ChatGPT, YouChat, and Chatsonic | It is evident from this study that all five AI content detectors is yet to accurately detect AI-generated content from machine-generated texts in diverse situations. This has dire consequences for AI-generated plagiarism in academic essay writing |
| [35] | This study explores ChatGPT evolution and studies its applications, opportunities, and threats with a focus on the business and industry and education domains. | This study found that despite ChatGPT exceptional ability to produce timely feedback, the authors believe that it lacks the ability to empathize as human and cannot completely replace human in certain circumstances. |
| [36] | The study investigates the emergence of AI tools including ChatGPT. Furthermore, it examines their impact in academic settings and the possible conflicts relating to intellectual property | The study shows that the use of AI and LLMs in academic and scientific research is here to stay |
| [37] | The article examined how generative AI are being used by the South African university students in their academic practices | The study findings shed light on the multi-cultural and socio-economic variables that impact AI adoption among the South African students and educators. |
| [38] | This study examined students' essay-writing performances with or without ChatGPT as an essay-writing assistance tool | The study findings revealed that the performance of those that used ChatGPT is not better than those that did not use it. |
| [39] | The role of ChatGPT as a writing assistant in academia was examined by this study. | The study revealed that ChatGPT in education is an ongoing development process, and the academic sector has both opportunities and challenges in adopting ChatGPT as a writing assistant. |
| [40] | This study explores the views of academics on ChatGPT as an AI-based learning strategy at an open distance e-learning (ODeL) institution of higher education | The finding revealed the benefits and risks of ChatGPT in teaching and learning. |
| [41] | This paper investigates an AI tutoring bot in mathematics. In addition, it examines how this bot communicates with learners using their native language (Afrikaans) | The study reveals that there are some repeatable mistakes made by Prof Pi. However, despite this mistakes, Prof Pi configured in Afrikaans could still benefit home language Afrikaans speaking students. |
| [42] | The study explores how ChatGPT can support language teaching and learning. | The study findings show that ChatGPT is here to stay, Hence, learners and tutors need to be capacitated with advanced technology to successfully navigate their benefits and risks. |
| [43] | This paper explores the effects of ChatGPT for language learning in academic environments | The findings show that there is high potential of using ChatGPT's for language learning in higher education. |
| [44] | This paper aims at exploring how to leverage Zimbabwean higher and tertiary Education with Artificial Intelligence (AI) based Virtual Assistants (VAs) among learners from various faculties at Midlands State University (MSU) | The authors managed to implement the system using the prototype software development model. The authors trained the system with a set of numeric data from Introduction to Information Technology Questions and Answers. The data was trained to develop a pkl model which was used to communicate with the user |
| [45] | This study explores virtual intelligence usage during the pandemic period | The findings show that with the help of virtual intelligence, the technical Know-how has played a significant role in the student's learning experience. The study concludes that with the help of AI, virtual intelligence can be enhanced. |
| [9] | This paper investigates the good, the bad and the ugly side of using AI tools in education and research | The findings reveal that it is essential to maintain balance between human elements and AI tools in education. Furthermore, it emphasizes the importance of establishing an ethical framework for AI deployment in educational contexts. |

### *A. Beneficial Applications of ChatGPT in the Higher Educational Sector*

This section answers RQ1 by exploring the benefits of using ChatGPT in the higher educational sector. One of the major domains where ChatGPT is often used is Education [14], [62]. Educators and learners are now making use of

ChatGPT by integrating it into classroom [14]. ChatGPT has been used to enhance student participation, improve students' educational experiences, provide feedback on assignments, and help educators in the evaluation of exams and content preparation. This section presents the beneficial application of ChatGPT in the higher educational sector. These beneficial applications were further summarized in Tables 4 and 5 respectively.

From the findings highlighted in Table 4, the beneficial application of ChatGPT in the higher educational sector are synthesized and categorized into personalized learning, research assistance, writing assistance, language learning and virtual assistance. Hence, Table 5 maps each reviewed paper as it relates to each category accordingly.

TABLE 5
MAPPING OF THE REVIEWED PAPER WITH THE CATEGORIES OF BENEFICIAL APPLICATION OF CHATGPT IN HIGHER EDUCATION

| Reference | Personalized learning | Research & Writing assistance | Language Learning | Virtual Assistance |
|---|---|---|---|---|
| [30] | ✓ | | | |
| [31] | | ✓ | | |
| [32] | ✓ | | | |
| [33] | | ✓ | | |
| [34] | | | | |
| [35] | | ✓ | | |
| [36] | | ✓ | | |
| [37] | | ✓ | | |
| [38] | | ✓ | | |
| [39] | | ✓ | | |
| [40] | | | ✓ | |
| [41] | | | ✓ | |
| [42] | | | ✓ | |
| [43] | | | | |
| [44] | | | | ✓ |
| [45] | | | | ✓ |
| [9] | ✓ | ✓ | ✓ | ✓ |

*1) Personalized learning*

Utilizing AI chatbots such as ChatGPT for personalized learning involves leveraging the ChatGPT system to deliver tailored instruction to students [32]. With this advanced technology, students no longer need to wait for a tutor or teacher to address their queries, resulting in significant time savings [30]. ChatGPT is accessible whenever students need it, making it more convenient for them to integrate study sessions into their busy schedules [31]. "This immediate accessibility empowers learners to clarify doubts or understand complex concepts at their own pace without feeling time pressured as they might in traditional classroom settings"[9].

Furthermore, students can use ChatGPT to facilitate personalized learning, provide immediate feedback, data acquisition, participant interaction, and more in research among other things [9]. Similarly, several chatbots are currently employed for literature search, review, content analysis, scientific writing, and revision [32].

*2) Research and writing assistance*

Integrating AI tools into research has unveil new opportunities since the emergence of OpenAI's ChatGPT [33]. Researchers harness this sophisticated tool to tap into enormous information across several fields [9]. Content analysis and literature reviews are among the most remarkable contribution of ChatGPT in assisting researchers [31]. With ChatGPT, significant time and effort are saved when researchers utilize it to summarize lengthy articles.

Furthermore, ChatGPT assist both learners and teachers in their writing skills as it improves the coherence, grammar and the writing style [38]. Bahrini, et al. [35] posits that ChatGPT has now been used to extract key points and provide feedback on references. This remarkable functionalities in ChatGPT helps in enhancing the efficiency of researchers [36], [37]. With the emergence of ChatGPT, the academic settings have harnessed this tool to facilitate diverse writing tasks [39].

*3) Language Learning*

ChatGPT has paved way for a new and exciting avenue in language learning by its ability to mimic human conversation [42]. Using ChatGPT to provide personalized instruction to students particularly in language learning makes it even more valuable [40], [43]. According to Butgereit and van Staden [41], when language instructors use ChatGPT to tailor their lessons plans to each student's preferences, it enhances the effectiveness and interaction of the teaching and learning. For example, students can use ChatGPT to engage in conversation, practicing their speaking and knowledge skills in a conducive setting. ChatGPT offer immediate feedback with simpler explanations, allowing students to correct their mistakes and improve their language skill over time

In addition, it helps learners improve their grammatical statement by providing explanations with suitable examples [9]. Likewise, it helps students to learn and use more vocabulary as it introduces new phrases in a conversational context, which makes it easier for them to remember [9].

*4) Virtual Assistance*

In higher educational institutions, ChatGPT is being used as a virtual tutor or assistant in providing students with personalized support and guidance [45]. Unlike human tutors who may not always be available all the time, ChatGPT provides real time assistance to students at any time regardless of their location or time zone [44]. Moreover, while the traditional classroom instruction is still in use, ChatGPT can also be used as a supplement to provide additional clarifications and practice exercises to support learning outside of class hours [9].

Furthermore, ChatGPT is a valuable time-saver for teachers, as it eliminates the need for them to spend additional time explaining difficult topics to students [45]. With ChatGPT being used as virtual assistants, students can seek extra help without feeling embarrassed in front of their peers [45]. ChatGPT have immense potential as educational tools, especially in their role as virtual tutors [44].

### *B. The impacts of using ChatGPT in higher educational sector*

This section answers RQ2 by evaluating the impact of ChatGPT in the higher educational sector. With the emergence of ChatGPT, several mixed reactions have been reported on its impact in the educational sector [11]. Many teachers oppose using this new technology in classrooms, calling it the "death of the essay" and other woes in education [11], [63]. According to Hasanein and Sobaih [64] the use of ChatGPT has a negative impact on educational system and may affect students learning experience. This section outlines the most common impact of ChatGPT on higher educational sector. This was further summarized in Tables 6 and 7 respectively.

TABLE 6
REVIEWED PAPERS ON COMMON IMPACTS OF CHATGPT ON THE HIGHER EDUCATIONAL SECTOR

| Reference | Aims/Objectives | Findings |
|---|---|---|
| [46] | The study examines the drawbacks and ethical challenges of using ChatGPT in research. | The findings present various ethical issues in AI technological domain including ChatGPT |
| [47] | The study investigates the political and demographic biases embedded in widely used AI systems. | The study reveals that AI systems like ChatGPT being systematically politically biased, may lead to increased societal polarization. |
| [48] | This study examines how ChatGPT is used in simulating conversations with users and describes its implications. | The findings show that biases in ChatGPT input data can be minimized with some techniques such as diversify data source and verify data quality. |
| [49] | The study explores AI chatbots in academic libraries with the challenges associated with it | The study found that there are ChatGPT risks such as inaccurate query responses, misuse, and technology reliance. Hence, the study recommends that ChatGPT serve as an addendum rather than replacing human services. |
| [50] | The study explores ChatGPT drawbacks when using it for research and academic writing | The study found that ChatGPT's integrity and correctness in scholarly writing has been questioned despite its ability to produce exceptional scientific content. This is because it produces information that may be true or false |
| [51] | The study examines the issue of digital inequality as it relates to ChatGPT. | The findings reveals that those that does not have access to computer and internet are unable to enhance their knowledge with ChatGPT or any other online resources |
| [52] | This explores privacy, digital divide, sustainability, and ethics associated with the use of ChatGPT | The findings reveal ChatGPT privacy concerns specifically regarding how the training data were collected and used by OpenAI |
| [53] | This study examines AI chatbots impact on Higher Education Institutions (HEIs) by focusing OpenAI's ChatGPT. | The study identifies risks which include misinformation, privacy breaches, biases and accessibility issues. |
| [9] | This study provides an in-depth exploration of the use and role of AI in education and research, focusing on the benefits (the good) and potential pitfalls (the bad and ugly) associated with the deployment of chatbots and other AIEDs | There are concerns that require critical consideration. Concerns regarding job displacement are growing. The potential exists for these tools to inadvertently spread false information or reduce education to rote memorization based on AI responses |
| [38] | This study examines the applications, opportunities, and threats of ChatGPT in 10 main domains, providing detailed examples for business and industry as well as education | The study reveals the potential threats such as producing misleading results and biases as well as ethical concerns |

From the findings highlighted in Table 6 the impacts associated with the use of ChatGPT in the higher educational sector are synthesized and categorized into bias reinforcement, misinformation, over-reliance, and digital inequality. Hence, Table 7 maps each reviewed paper as it relates to each category accordingly.

*1) Bias Reinforcement*

Chatbots, such as ChatGPT, reflect the biases present in the data they are trained on [53]. Biases within the training data can be learned and replicated by the model. ChatGPT typically rely on a vast array of internet text for training,

allowing them to produce human-like text but also posing a significant risk of reinforcing biases [46]. To begin with, ChatGPT training data comprises content from the internet, exposing them to the biases inherent in these texts, spanning factors like religion, gender and, race [53]**.** Consequently, the AI might accidentally perpetuate these biases when generating responses, contributing to their reinforcement [47].

ChatGPT relies on existing answers and lacks the cognition needed to tackle new questions [46]. This bias makes ChatGPT's output untrustworthy and presents a significant risk of bias reinforcement, especially for students. However, to enhance the credibility of ChatGPT's results, researchers recommend open AI models that provide greater transparency about the data used in their training [38].

TABLE 7
MAPPING OF THE REVIEWED PAPER WITH THE CATEGORIES OF COMMON IMPACTS OF CHATGPT ON THE HIGHER EDUCATIONAL SECTOR

| Reference | Bias Reinforcement | Misinformation | Over-reliance | Digital Inequality |
|---|---|---|---|---|
| [46] | ✓ | | ✓ | |
| [47] | ✓ | | | |
| [48] | | | | |
| [49] | | ✓ | ✓ | |
| [51] | | | | ✓ |
| [52] | | | | ✓ |
| [53] | ✓ | ✓ | | ✓ |
| [9] | | ✓ | | |
| [38] | ✓ | ✓ | | |

*2) Misinformation*

In higher educational institutions, the spread of misinformation makes it challenging to use ChatGPT because it relies mostly on huge amounts of data to formulate responses [53]. Adetayo [49] posits that the cyber space is full of misinformation, thereby causing flaws in the output produced from ChatGPT. For instance, ChatGPT may mistakenly disseminate errors if it encounter inaccuracies in its training which may mislead researchers if they depend on it [53].

Similarly, the ability of ChatGPT to generate new content based on learned patterns introduces another layer of concern [58]. While this feature is innovative, it could lead to the creation and spread of misinformation [38]. To address these risks, it is essential to integrate ChatGPT usage with information literacy and critical thinking skills [9].

*3) Over-reliance*

The adverse effects of using ChatGPT have raised several concerns particularly in higher educational [46]. For example, there are learners who rely solely on ChatGPT to do their tasks [49]. This over-reliance on ChatGPT does not give room for critical thinking and also weakens the opportunities for students to engage in face-to-face interactions with their teachers or classmates [49].

Moreover, excessive reliance on ChatGPT could harm the social areas of learning [46]. Education extends beyond the mere transmission of information; it encompasses human interaction, socialization, and collaboration. If ChatGPT becomes the dominant mode of learning, these critical aspects may be weakened. [46]. Hence, it should be noted that while ChatGPT provide valuable support for education and research, overreliance on this AI tool can pose challenges to critical thinking and social interactions.

*4) Digital Inequality*

Disparities in access to technology and internet connectivity has restricted some students in benefiting from ChatGPT thereby exacerbating existing digital inequalities [52]. According to Khan and Paliwal [51] digital inequalities arises when there are disparities in technology access, leaving those without access at a disadvantage. This issue can worsen the existing educational inequalities, by widening the gap between those who can avail themselves of the opportunity of using ChatGPT and those who cannot [53].

*C. ChatGPT Ethical challenges in education*

This section answers RQ3 by investigating the ethical issues associated with the use of ChatGPT in higher educational sector. It delves deeper into the ethical dilemma and associated risks. The ethical challenges are summarized in Tables 8 and 9 respectively. From the findings highlighted in Table 8 ethical challenges associated with the use of ChatGPT in the higher educational sector are synthesized and categorized into 1) data privacy and security, 2) plagiarism and 3) academic dishonesty and cheating. Hence, Table 9 maps each reviewed paper as it relates to each category accordingly.

*1) Data Privacy and Security*

ChatGPT's training process systematically involves collecting data from various sources such as websites, posts, books, and articles, which may include personal data [54]. Allowing ChatGPT access to personal data, such as

students' grades, inherently entails the risk of data breaches or misuse [55], [56]. "The training dataset is growing exponentially, with ChatGPT's dataset exceeding 570 GB, necessitating a substantial amount of real-world data [54]".

Although ChatGPT incorporates privacy protection mechanisms, such as restricting access to personal data, there is no absolute guarantee against potential leakage of its training data [54]. Malicious activities, such as jailbreaking attacks, could exploit its advanced generative capabilities to infer sensitive information from personal data or even leverage it to target other AI models [60].

TABLE 8
REVIEWED PAPERS ON ETHICAL CHALLENGES ASSOCIATED WITH THE USE OF CHATGPT IN HIGHER EDUCATION SECTOR

| Reference | Aims/Objectives | Findings |
|---|---|---|
| [54] | This study focused on the security, privacy, and ethical concerns raised by ChatGPT. | The findings reveal the associated risks such as plagiarism and copyright issues relating to ChatGPT. |
| [55] | The study explores the use of ChatGPT and its ethical issues in Education | The study reveals that while using ChatGPT in Education, there should be respect for privacy, fairness and transparency. |
| [56] | This study focused on chatbots information security as well as identifying the threats. | The findings reveal chatbots security threats, such as user profiling, malicious input, data breaches and contextual attacks |
| [57] | This study reviewed the existing literature on ChatGPT usage in scholarly writing and its challenges which include plagiarism. | The result of this study shows that the use of ChatGPT for academic writing without appropriate referencing leads to plagiarism. |
| [58] | This study explores the originality of ChatGPT content using two plagiarism detection tools | This study reports plagiarism as a growing concern that requires attention when using ChatGPT. In addition, the findings reveal the possibility of learners using ChatGPT to do their essay-type assignments without getting caught |
| [59] | The study investigates the impact of ChatGPT on plagiarism and scholarly writing. | The findings reveal that academic ethical standards and integrity can be maintained when using ChatGPT provided the students are taught with the skills, they need to navigate higher education ethically. |
| [10] | This paper explores ethical challenges associated with the use of ChatGPT in education. | The findings highlight the significant ethical concerns such as data privacy and academic integrity to be considered when integrating ChatGPT into the classroom. |
| [60] | This study explores how Language Models (LLMs) such as ChatGPT can undermine academic integrity particularly for online examinations | These findings emphasize the need for robust online exam security measures such as advanced proctoring systems and more sophisticated multimodal exam questions to mitigate potential academic misconduct enabled by AI technologies |
| [61] | The explores the issues related to academic integrity, ethics and regulations | The findings highlight the ethical issues that may arise as a result of using ChatGPT in academic environment. |
| [50] | The study explores ChatGPT drawbacks when using it for research and academic writing | The study found that ChatGPT's integrity and correctness in scholarly writing has been questioned despite its ability to produce exceptional scientific content. This is because it produces information that may be true or false. |

TABLE 9
REVIEWED PAPERS ON ETHICAL CHALLENGES ASSOCIATED WITH THE USE OF CHATGPT IN HIGHER EDUCATION SECTOR

| Reference | Data Privacy and Security | Plagiarism and Academic Dishonesty |
|---|---|---|
| [54] | ✓ | |
| [55] | ✓ | |
| [56] | ✓ | |
| [57] | | ✓ |
| [58] | | ✓ |
| [59] | | ✓ |
| [10] | ✓ | ✓ |
| [60] | | ✓ |
| [61] | | ✓ |
| [50] | | ✓ |

*2) Plagiarism and Academic Dishonesty*

The possibility of students misusing ChatGPT to produce plagiarized contents is high [59]. Studies has shown that when student incorporate text produced by ChatGPT in their writing tasks without proper referencing of the source, it often constitute plagiarism [57]. While ChatGPT can aid students to understand difficult concepts, it could also generate content that resembles human writeups which can lead to plagiarism [58].

Similarly, maintaining academic integrity while using ChatGPT is one of the ethical challenges faced in the academic settings [10]. The authenticity of learner work can be undermined by ChatGPT as it raises the issue of cheating and plagiarism [60]. Moreover, during exams, students could utilize ChatGPT in real-time to cheat, thereby jeopardizing the fairness of assessments [50]. Malik, et al. [61] and Singh [59] also express concerns about the unethical use of ChatGPT in academic settings.

## V. Discussion

The study's findings show that the emergence of ChatGPT has transformed the academic settings by providing several assistance to both students and teachers while also presenting some challenges such as ethical issues that require careful consideration [53]. Consequently, this study presents the following recommendations. It is essential to note that the recommendations presented in this discussion section are based on the findings of this study and are also informed by previous studies,

### *A. Recommendations Based on RQ 1*

This study recommends regulating the use of ChatGPT for academic purposes. According to Dempere et al. [57], it is important that the use of ChatGPT be regulated to mitigate against risks that would compromise academic integrity and deter inappropriate of use of AI tools. Hasanein and Sobaih [64], posit that regulating ChatGPT helps in facilitating the credibility of academic output which is an important aspect in the academic sector. Furthermore, it is essential to recognize the use of ChatGPT as a supporting mechanism for both teachers and leaners in their effort to integrate the tool to enhance their scholarly work and skills [53]. While this AI tools such as ChatGPT have the potential to increase the research capabilities of learners, teacher's supervision is recommended whenever students are using it. This recommendation aligns with the study by Bettayeb, et al. [65], which suggests encouraging teachers to be actively involved.

### *B. Recommendations Based on RQ 2*

The study recommends creating students' awareness on several issues related to using ChatGPT in higher education institutions. As this study discussed in presiding sections, it is important to enhance learners understanding on the use of ChatGPT, its benefits, the challenges and any other risks that would compromise their academic innovation and productivity [53]. Furthermore, it is the responsibility of higher education institutions to raise awareness to their scholarly community about these institutional policies that provide guidelines on the use of AI tools in academic work. This implies that awareness effort must address the benefits of promoting and guiding academic integrity through the use of ChatGPT as well as highlighting the consequences of violating the guidelines. In addition, the study recommends addressing the issue of digital inequality for students who may want to use ChatGPT but do not have access to a computer. According to Khan and Paliwal [51] disparities in technology access can result in a digital divide, leaving individuals without the necessary technology at a disadvantage. Also, Dempere, et al. [53] affirm that digital inequality cut across gender, class, race, background, and geographical areas. Hence, higher institutions should have a policy intervention to ensure more equitable inclusion [52].

### *C. Recommendations Based on RQ 3*

Academic integrity and ethical consideration are non-negotiable in the higher education sector. This is because the sector plays a critical role in shaping economic growth and human development of nations [53]. Therefore, the use of AI tools including ChatGPT must be carefully regulated through the use of appropriate institutional policies that guide against the misuse of ChatGPT. According to Lo [14] it is essential to encourage learners to think creatively without dependency on any AI tools that would impede their ability to be innovative. Moreover, institutions of higher learning should explore possibilities of collaborating with technology experts to deepen the practice of ethical innovation bounded by responsible use of AI tools [65]. In addition, there should be continuous engagement between the students and the university administrations to identify and address any AI tools challenges that could compromise their relationship as partners in the sector.

## VI. Conclusions

This article has highlighted the importance of using AI tools such as ChatGPT in the higher education sector, underscoring its advantages and the threats that it poses to the sector if the use remains unregulated. The study has recommended institutional policies about the use of AI tools must be in place to guide university staff, researcher and learners in the responsible use of AI tools for academic work. This research was limited to a literature review of published material; hence, future research should focus on collecting primary data to provide insights on ChatGPT and its impact on student assessment practice in the Higher Education Sector.

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