Research Article

ChatGPT: An ever-increasing encroachment of artificial intelligence in online assessment in distance education

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ARTICLE INFO	ABSTRACT
	The use of artificial intelligence (AI) in education is becoming increasingly prevalent, and its encroachment and impact on online education and assessment is a topic of interest to researchers and lecturers. ChatGPT is one such AI model that has been trained on a large corpus of text data to generate human-like responses to questions and prompts. Using the theory of disruptive innovation as a foundation for our argument, this conceptual article explores the potential and possible disruption of ChatGPT in online assessment. This article also considers the ethical and pedagogical implications of using ChatGPT, particularly in relation to online assessment in distance education. While the use of AI in online assessment presents a myriad of limitations and possibilities, it is crucial to approach its use with caution and consider the ethical implications of academic integrity for online assessment. This article aims to contribute to the ongoing discussion and debate around the use of AI in online higher education and assessment, highlighting the need for continued research and critical evaluation of its impact. **Keywords:** artificial intelligence, ChatGPT, higher education institutions, online assessment, open distance and e-learning

INTRODUCTION

ChatGPT (generative pre-trained transformer) is the latest sensation out of San Francisco-based startup OpenAI (Jolly, 2023). ChatGPT3.5 is a large language model (LLM) chatbot introduced in late November 2022, which is used by both professionals and non-professionals. ChatGPT is a conversational LLM that uses artificial intelligence (AI) to maintain a conversational style with a persona or identity that remains consistent throughout the conversation (Qadir, 2022). Its attraction is its ability to generate responses that are human-like, coherent, and meaningful. ChatGPT can answer follow-up questions, admit mistakes, challenge incorrect premises, and reject inappropriate queries (Assaraf, 2022). This adds to its realistic engagement with the user. It took just five days for ChatGPT users to reach one million (Buchholz, 2023). The current number of users of ChatGPT stand at an estimated one hundred million users (Tamim, 2023). Other online services took much longer to reach one million users. The closest is Instagram, which reached one million users in two and a half months.

ChatGPT is the go-to AI in a similar way to which Google has been depended for information (Metz & Weise, 2023; Tung, 2023). The difference between ChatGPT and Google is that Google presents a user with information that needs to be read and understood while ChatGPT provides specific answers in a conversational style like a human answering a question. It is for this reason that ChatGPT has been described as 'Google on steroids' (Timothy, 2022). Depending on the speed of the internet connection, ChatGPT can

generate an answer to a question in under thirty seconds. Apart from writing any genre of text, ChatGPT can also edit, paraphrase, and analyze a text. In addition to these writing tasks, ChatGPT is practical and can be used to generate cover letters for jobs, create curriculum vitae (CVs), generate jokes, explain complex problems, discuss mathematical solutions in a step-by-step fashion, explain and write code and create content in different languages (Rudolph et al., 2023; Susnjak, 2022; Timothy, 2022). The limitations of ChatGPT are that the quality of the answer provided by ChatGPT (output) will depend on the quality of the question or input. Clear questions and prompts will generate better responses by ChatGPT. Many ChatGPT users have discovered that ChatGPT can provide incorrect answers with incomplete information (Montti, 2022). Furthermore, ChatGPT does not cover events post-2021 and if its servers are overwhelmed, then the platform is inaccessible for periods of time (Visagie, 2022).

Rationale

It may still be early days, but our current thinking, experimenting with, and philosophizing about ChatGPT seems to indicate that ChatGPT is likely to disrupt online assessment practices in higher education institutions (HEIs); especially in an open distance and e-learning (ODeL) context, such as the University of South Africa (Unisa). It is for this reason that we ask: What does the future hold for online assessment in higher education in an ODeL university in the context of ChatGPT?

Drawing on the theory of disruption and innovation (Christensen, 1997, 2006; Christensen et al., 2003, 2015), we identify the processes that have the potential to significantly alter the shape of online assessment as we know it. This study adds to the existing discussion on ChatGPT (de Winter, 2023; Kung et al., 2022; Terwiesch, 2023) and concerns raised by lecturers on the reliability of online assessment. We have noted that there is limited research on ChatGPT in ODeL contexts; therefore, our purpose is to draw attention to the future of online assessment in higher education in an ODeL university in the context of ChatGPT. ChatGPT was an inevitable development given the advancements made in AI technology over the past ten years (Rudolph et al., 2023; Susnjak, 2022). The significance of this article extends beyond the scope of this study; it seeks to question the validity of online assessment in HEIs and the type of questioning that online assessment will require. The discussion generated in this article has implications for lecturers, students, and managers across HEIs. This conceptual article discusses our thoughts on ChatGPT in an ODeL context and centres on the following themes:

1. ChatGPT's performance in traditional assessment
2. The disruption and potential of ChatGPT to transform online assessment
3. Ethical implications of ChatGPT for online assessment
4. Pedagogical implications of ChatGPT for online assessment

To discuss the themes above, we use the theory of disruptive innovation (Christensen, 1997) to interrogate ChatGPT's encroachment in online distance education and assessment in HEIs.

Theorizing ChatGPT as a Possible Disruptive Innovation in Online Assessment

The concept of 'disruptive innovation' has become a fetishized term over the past decade, with many researchers using it to identify and explain phenomena that have the potential to transform the world in a positive way (Manocha et al., 2022). Christensen (1997) defines disruptive innovation as "a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors" (p. xviii). We are aware that Christensen's (1997) theory of disruptive innovation is usually used in the fields of business and technology innovation. However, we have used it as a theory to interrogate the possible disruptive and innovative potential that ChatGPT can have on online assessment in higher education. This article uses the theory of disruptive innovation, as defined by Christensen (1997), to identify processes that hold promise for positively changing existing systems. Christensen's (1997) theory of disruption is a framework for understanding how new technologies and business models can disrupt established industries and markets. This theory explains how disruptive innovations emerge, gain traction, and ultimately replace existing products, services, or technologies (Manocha et al., 2022; Urlaub & Dessein, 2022).

Although disruptive innovations are initially inferior in performance compared to established technologies, they are cheaper and more accessible (Manocha et al., 2022). Over time, they improve and eventually outperform the established technologies, creating a new market. Examples of disruptive innovation in online assessment are the use of AI and machine learning to automate and personalize the assessment process (Chen et al., 2018; Li & Lalani, 2020). AI-powered assessment tools can provide more accurate and objective assessments compared to human assessors, at a fraction of the cost. Another example of disruptive innovation in online assessment is the use of gamification to create engaging and interactive assessments that can improve student engagement and motivation (Kapp, 2012). This approach can provide a more immersive and enjoyable assessment experience, leading to better learning outcomes.

In this article, we use Christensen's (1997) theory of disruptive innovation to understand how ChatGPT might disrupt the traditional methods of assessment used in education. Online assessment in distance education relies heavily on human assessors, who are often limited in availability, expensive, and prone to making errors. However, with the development of AI technologies like ChatGPT, HEIs can provide more efficient and reliable assessments at a lower cost (Kumar et al., 2021). ChatGPT has been used to assess essays, answer questions, and provide feedback to students, which significantly reduces the workload of lecturers and provides immediate feedback to students (Kasneci et al., 2023). Christensen's (1997) theory of disruption is relevant because ChatGPT can be considered a possible disruptive innovation that displaces traditional assessment methods and transforms online assessment.

ChatGPT's possible disruptive potential lies in its ability to learn and adapt to user input by continuously improving its responses over time (Christensen & Horn, 2008). This capability has the potential to transform the way students process their teaching and learning material with ChatGPT to facilitate epistemological access. According to Kumar et al. (2021) and Manocha et al. (2022), the use of new technologies like ChatGPT has assisted in addressing the challenges experienced by the COVID-19 pandemic. They found that new technologies have the potential to be disruptive innovations by displacing the traditional value network of face-to-face instruction. In a post-COVID-19 dispensation, this paradigm shift in education delivery provides students with low-cost, high-quality, personalized, and accessible education, with a focus on flexibility.

Christensen's theory of disruption is useful for understanding the impact of ChatGPT on assessment in online education in ODeL contexts. It can help us to identify the key drivers of ChatGPT's success, as well as the potential challenges and risks that it may pose as it continues to encroach on online assessment. However, as with any disruptive innovation, there may be resistance from stakeholders, such as lecturers and managers, who are not ready to adapt to the changes brought about by ChatGPT. In addition, the traditional value network of assessors may resist the integration of ChatGPT into online assessment, viewing it as a threat to their livelihoods (Christensen, 1997).

By applying Christensen's (1997) theory of disruption and innovation to ChatGPT, we were able to gain insights into the ways in which this technology is likely to shape the future of human-machine interaction, the ethical implications of ChatGPT for academic integrity in education, and the implications that this may have for online assessment in higher education.

ChatGPT's Performance in Traditional Assessment

In recent months, the potential of using ChatGPT has grown significantly. However, there are limited peer-reviewed articles to reference in distance education because ChatGPT is a recent phenomenon. To fully grasp the potential and possibilities of ChatGPT in traditional assessment, we explored peer-reviewed publications and pre-prints that are of interest to us.

In a study conducted in the Netherlands (de Winter, 2023), ChatGPT was used to complete an English comprehension examination. The examination consisted of multiple-choice questions and questions requiring short answers. In the Netherlands, a mean grade of 5.50 would imply a pass in the high school diploma. The average student's mean grade was 7.0 for this comprehension examination while ChatGPT obtained a mean grade of 7.18. These findings suggest that ChatGPT performed similarly to the average student in the Netherlands. This would raise concerns if students were allowed to take their examinations online. Fortunately, students in the Netherlands follow traditional assessment practices, which is a venue-based examination (de Winter, 2023).

Another interesting study conducted by Terwiesch (2023) at the University of Pennsylvania, in the United States, documents how ChatGPT performed on the final examination of an MBA course. The findings revealed that ChatGPT did an excellent job answering questions on operations management and process analysis. It was found that ChatGPT was particularly good at modifying responses with a hint from a human. So, if the initial answer that ChatGPT offered was incorrect, and a human-provided a hint, then the revised answer from ChatGPT was more accurate. However, this study also revealed two drawbacks in ChatGPT's response. ChatGPT made mistakes in simple calculations and was not able to answer more advanced process analysis questions. In the end, ChatGPT's performance was graded at a B to B- on the final examination of an MBA course (Terwiesch, 2023). ChatGPT's excellent performance on the final examination of an MBA course has implications for traditional assessment and the awarding of a degree. If this course were to be offered online, then the validity of the results of the course becomes questionable.

ChatGPT was put to the medical test in a study conducted by Kung et al. (2022). ChatGPT was used to answer the United States medical licensing exam, which consists of three examinations: step 1, step 2CK, and step 3. In this examination, ChatGPT performed at or near the passing threshold for all three examinations. Further, ChatGPT demonstrated a high level of concordance and insight in its explanations. These findings suggest that LLM's such as ChatGPT may have the potential to assist with medical education, and potentially, clinical decision-making (Kung et al., 2022). The authors of this study believe that ChatGPT could "soon impact clinical care at large in its ability to deliver truly individualized, compassionate, and scalable healthcare" (Kung et al., 2022, p. 17).

In the three studies discussed above, we discover ChatGPT's ability to pass a high school English comprehension test (de Winter, 2022), an MBA course (Terwiesch, 2023), and a medical examination (Kung et al., 2022). This ability of ChatGPT has implications for high stake tests and examinations if they were to be conducted online or follow the take-home examination format. The validity and reliability of these examinations can be questioned in the context of ChatGPT. It is for this reason that we have seen some schools and universities ban ChatGPT in classrooms and online spaces. According to Mhlanga (2023, p. 10), "It is feasible that [ChatGPT] will result in regulations that ban its utilization; nevertheless, it is also conceivable that [it] will become ubiquitous before institutions have the time to alter their policies." We deem that the use of ChatGPT might disrupt the traditional mode of online assessment; however, HEIs may struggle to implement a ban of ChatGPT as they may experience challenges and resistance in regulating its use. As with any innovation, stakeholders should adapt to its potential to remain relevant and competitive in the changing face of AI in education. Despite the potential innovation of ChatGPT, it may be seen as a disruptive technology.

Disruption and Potential of ChatGPT to Transform Online Assessment

Assessment is an important component of education, and is used to collect, analyze, and interpret a student's progress (Gikandi et al., 2011). This feedback is essential for students as it allows them to understand their strengths and weaknesses in a module (Black & William, 1998). Further, this feedback is also beneficial for lecturers as it can allow them to tailor their teaching and learning experiences for their students.

Online assessment refers to assessment that uses technology to evaluate a student's skill, knowledge and ability through digital platforms such as web-based applications, mobile devices, or computer-based tests (Al-Maqbali & Hussain, 2022). There are various assessment tools that can be used for online assessment. These include multiple-choice, short answers, essays, e-portfolios, self-assessment, and peer assessment. The type of assessment tool used will depend on the learning objectives and level of the module. Online assessment can be implemented in several ways, this will depend on the learning objectives, the assessment goals, and the available technology. Online assessment can be administered on learning management systems (LMSs) such as Moodle. Assessment parameters can also be used such as time limits, randomization, and the number of times students are able to take the assessment.

The two common types of assessment used in HEIs are formative assessment and summative assessment. Formative assessment is used to evaluate the student's learning throughout a course or program and provides students with feedback on their strengths and weaknesses (Black & William, 1998). While summative assessment is used to evaluate students' learning outcomes at the end of a course or program as it evaluates their skills, knowledge, and abilities (Al-Maqbali & Hussain, 2022; Airasian, 2000; Black & William, 1998).

There are many advantages to online assessment (Al-Maqbali & Hussain, 2022). One of these advantages is convenience and flexibility, which allows individuals to take assessments at their own pace, time and location thereby reducing scheduling constraints while increasing accessibility. Scalability is another advantage of online assessment as it can accommodate many students simultaneously. Online assessments can also provide immediate feedback. This is helpful to students who can identify the areas they need to improve on. It is also cost-effective as it reduces the need for paper, printing costs, manual grading, and invigilating. Further, as online assessment is administered remotely it can save time and travel costs for students. Online assessments can be designed to prevent cheating (Lee & Aslam, 2023; Stevens et al., 2022) by using features such as randomization, time limits and proctoring tools (Novick et al., 2022; Oravec, 2022), making it another advantage.

Some of the drawbacks of online assessment include technical challenges, cheating and test anxiety. For online assessment to be successful, students require stable internet connection, compatible devices and appropriate software, which can be a challenge for students with limited resources and skills. Cheating is another drawback of online assessment as it is more difficult to prevent and detect in an online environment and this can compromise the integrity of the assessment (Lee & Aslam, 2023; Stevens et al., 2022). Students are also prone to high levels of test anxiety in an online assessment as compared to traditional assessments (Al-Maqbali & Hussain, 2022; Novick et al. 2022).

There has been an increase in online assessment in education across the globe. This acceleration is partly due to the COVID-19 pandemic, which forced HEIs to shift to remote learning and assessment (Guangul et al., 2020). Although online assessment has been implemented in many countries, there is no clear consensus to date as to whether online assessment is preferred over the traditional face-to-face assessment.

A study conducted with undergraduate students at a Hong Kong university found that less than 20% of all students surveyed (752) were satisfied with online assessment. Nearly half of the students preferred the traditional paper-and-pencil examination. The major barrier reported by students in online assessment was computer problems and internet connectivity (Lee et al., 2022). In another study conducted with undergraduate students in the UK, it was found that students performed better in online assessments compared to paper-based assessments (Osabutey et al., 2022). Osabutey et al. (2022) emphasize that assessments must align to the available technologies to ensure student success.

In online assessments, it is important for the lecturer to ensure that the questions set are clear and unambiguous and that clear instructions are provided to students on how to access the assessment and submit answers. The lecturer must also be able to assist students if they have technical issues or concerns. Implementing online assessments require careful planning, clear communication and the use of appropriate tools and technology. With the correct approach online assessments can be an effective way to assess students' knowledge, skills, and abilities.

Online assessments can be evaluated in several ways depending on the type of assessment tool and objectives. Evaluation methods include automatic grading, especially for multiple choice and short-answer questions. This saves time, resources, and reduces errors. Manual grading is used for essays and can be done online using rubrics and scoring guides. To ensure that the assessment results are fair, reliable, and accurate, plagiarism detection tools can be used to check for originality and prevent cheating (Novick et al., 2022; Oravec, 2022).

Learning outcomes are specific statements that describe the skills, knowledge, and abilities that students are expected to acquire at the end of a learning experience. The connection between assessment and learning outcomes is that assessment is used to measure the extent to which the learning outcomes have been achieved (Guangul et al., 2020). Hence, assessment supports the learning process and measures the degree of learning. It is for this reason that it is important to question the use of ChatGPT in online assessment.

ChatGPT can be seen as a possible disruption to online assessment in the same way that calculators were seen as a disruption to Mathematics education and computers were seen as a disruption to the teaching of handwriting. What are our real fears about ChatGPT? Are we afraid that ChatGPT will disrupt online assessment as we know it? Does this, therefore, mean the "death" of online assessment? Or does this signal a new type of assessment that can co-exist with ChatGPT?

To answer the questions we posed above, one of our primary concerns and fears about ChatGPT is its potential for cheating and academic dishonesty. Since ChatGPT can generate natural language responses that are indistinguishable from those generated by humans, there is a risk that students could use ChatGPT to cheat on assessments. Another fear is that ChatGPT could disrupt online assessment, particularly in terms of the role of human assessors. ChatGPT has the potential to automate the grading process, eliminating the need for human assessors and reducing the expenses and time associated with marking assessments. This could fundamentally transform the way assessments are designed and administered, challenging traditional assessment models and practices. However, these fears do not necessarily mean the "death" of online assessment. Instead, they signal a need for a new type of assessment that can co-exist with ChatGPT. This may involve developing new assessment models and practices to prevent cheating and academic dishonesty using ChatGPT, as well as rethinking the role of human assessors in the assessment process. Moreover, the ability of ChatGPT to personalize assessments for individual students could disrupt the one-size-fits-all approach to assessment that has been the norm in traditional modes of assessment.

Despite these fears, the use of ChatGPT in online assessment has already shown promising results (Kasneci et al., 2023). ChatGPT can personalize learning experiences for their students, analyze students writing and responses and provide immediate and specific feedback to students, and it can also suggest materials that would align to the students' learning needs (Kasneci et al., 2023). This potential of ChatGPT can assist lecturers in reducing their time spent on personalizing learning and providing feedback to their students.

These disruptions and the potential posed by ChatGPT could lead to a need for lecturers and managers in HEI's to consider new strategies of questioning and pedagogies to prevent cheating in assessments. This highlights the importance of carefully considering the implications of ChatGPT in the assessment process, both in terms of its disruption and potential. The possible disruptive potential of ChatGPT in distance education and assessment underscores the importance for lecturers and managers to adapt to new technologies and innovations in education (Kumar et al., 2021; Manocha et al., 2022). It also highlights the need for HEIs and lecturers to proactively embrace these disruptions and develop strategies to manage the risks and reap the benefits of these innovations. In the next section, we discuss the ethical implications related to the use of ChatGPT in online assessment.

Ethical Implications of ChatGPT for Online Assessment

The use of ChatGPT in online assessment raises several ethical implications that need to be carefully considered (Kerrigan et al., 2022); especially in distance education contexts, such as Unisa. One of the primary concerns is the potential for bias in the language model's responses, which could lead to unfair grading or evaluation. Our other concern is the potential for cheating, as the use of AI in assessment could make it easier for students to obtain answers without fully understanding the material. Additionally, there is a risk that the use of ChatGPT in online assessments could lead to a lack of human interaction and personalization, which could have negative effects on students' motivation and engagement. Therefore, it is essential to carefully consider the ethical implications of using ChatGPT in online assessment and take measures to mitigate any potential biases or negative effects (Kung et al., 2022; Terwiesch, 2023). Our views of ChatGPT are two-pronged: On the one hand, the use of it in online assessment may be seen as a threat to intellectual honesty and authenticity, as it may allow students to produce work that is not their own and may potentially lead to plagiarism. This could undermine the integrity of the assessment process and devalue the educational experience. On the other hand, the use of ChatGPT can also enhance the educational experience by allowing students to access information and resources that they may not have had access to otherwise.

A concern related to using AI in assessments is the potential for cheating. From our observations in practice and from the literature, we have noted that ChatGPT has been criticized for enabling students to cheat on academic assignments, leading to a loss of academic integrity in online assessment (Guo et al., 2023; Mitchell, 2022; Stokel-Walker, 2022; Susnjak, 2022). In the main, it seems as though students may not engage in the critical thinking and original writing required for academic work, and instead rely on ChatGPT to complete the work for them. There is also a concern that lecturers may not recognize students' work in online contexts due to the large number of students registered. The traditional model of assessment is based on the principle that students learn by engaging in critical thinking, original writing, and demonstrating their

knowledge and abilities through academic work (Li & Lalani, 2020). The use of ChatGPT in academic writing undermines this principle by allowing students to bypass the learning process and generate content with the help of AI. This could disrupt the traditional model of online assessment in higher education by devaluing the importance of critical thinking, original writing, and knowledge acquisition. We posit that this could also have serious consequences for academic institutions by damaging their reputation and undermining their degree's value. The impact of ChatGPT goes beyond online assessment. ChatGPT is currently being cited as an author in academic publications in accredited journals. The concern is that AI cannot take responsibility or credit for its work, and this may lead to substandard research publications.

On the contrary, ChatGPT can be beneficial for students in higher education in several ways (Elkin & Chun, 2020; Nisar & Aslam, 2023; Tack & Piech, 2022; Zawacki-Richter et al., 2019; Zhai, 2022); particularly in promoting academic integrity. ChatGPT represents an innovation that can transform the way students access information, conduct research, and develop their critical thinking skills. By providing students with access to a vast array of information and resources, ChatGPT can help promote the use of reliable and valid information in their academic work, which is essential for maintaining academic integrity (Chen et al., 2018; Kumar et al., 2021). It must be noted that ChatGPT has a self-improving capability, where it is constantly trained and updated with new data sets; this means that it and its responses can become more accurate in future (Rudolph et al., 2023). Additionally, by providing suggestions and corrections for writing and editing, ChatGPT can help students improve the quality of their work and ensure that it meets academic standards expected of universities. Moreover, ChatGPT can understand complex inquiries and provide relevant answers in real-time, as demonstrated in a study that found ChatGPT's response rate to be less than two minutes for a 300–500-word output (Deng & Lin, 2022; Kumar, 2023). This feature can greatly simplify information retrieval, saving students time and effort in searching multiple sources and search engines, making it highly beneficial for students who are under time constraints and under pressure of online assessment deadlines. From a pedagogical perspective, ChatGPT can help students save time; this means that students can spend more time on critically reading questions and the given text in an online assessment (Cascella et al., 2023) Finally, by encouraging students to engage with diverse ideas and perspectives, ChatGPT can help them develop their critical thinking skills, which is essential for maintaining academic integrity.

While use of ChatGPT may represent a potentially disruptive innovation that can transform the way students learn and research, it is important to consider the ethical implications of its use. Ethics of learning involves considering the ethical implications of using technology in the context of learning and education. This includes the potential for bias or misuse of technology, as well as the need to ensure that technology is developed and used responsibly, with a focus on creating positive outcomes for students in HEIs. As a university that prioritizes academic integrity, Unisa should consider returning to invigilated and oral exams as a possible solution to address academic misconduct, while recognizing that advanced proctoring techniques and AI-text output detectors may not be fool-proof solutions. It is essential for distance learning universities to remain vigilant in exploring and implementing additional measures that uphold academic integrity to ensure the credibility of its degrees and the trust of its students and stakeholders (Susnjak, 2022). However, it is important to recognize that the use of AI tools by students does not necessarily constitute academic misconduct or plagiarism, but rather the responsibility lies in ensuring that its use is transparent and appropriately disclosed. Thus, HEIs must update their academic integrity policies to account for the use of these tools and decide what constitutes academic misconduct. Failure to adapt policies to address the use of AI tools could result in inconsistent enforcement and hinder progress in the development of future online assessment contexts. In the next section, we turn our attention to the implications of ChatGPT for HEIs and we provide pedagogical implications to show how ChatGPT can support students in large modules in online assessment.

Pedagogical Implications of ChatGPT for Online Assessment

Pedagogical implications of ChatGPT for online assessment in distance education are significant, and the theory of disruptive innovation sheds light on challenges and opportunities that come with its development and use. Distance learning universities like Unisa may particularly benefit from incorporating ChatGPT into their teaching and assessment practices; especially if we can find ways for its use in larger modules.

While some lecturers may be concerned about students who outsource their online assessments to ChatGPT, such worries may stem from resistance to adapting to new assessment methods (McMurtrie, 2023). However, ChatGPT is expected to become a regular part of writing in HEIs (Chen et al., 2018; Kumar et al., 2021; McMurtrie, 2023). Exposing distance education students to ChatGPT can help promote learning and incorporate technology into teaching (Sharples, 2022). As the development of LLMs continue, ChatGPT-4, the successor to ChatGPT-3.5, has just been released. The potential capabilities of GPT-4 are believed to outweigh that of GPT-3.5 and further revolutionize natural language processing. This advancement may have implications for online assessment in HEIs, particularly with the integration of GPT-4 technology. While ChatGPT is already capable of generating intelligent narratives in seconds (McMurtrie, 2023), including Bing's added AI features (Metz & Weise, 2023; Tung, 2023), the development of GPT-4 leads to even more sophisticated AI-generated content–analyzing images, videos, and other media–posing new challenges for maintaining academic integrity in online assessments. Therefore, universities should continuously adapt their rules and regulations to keep up with the rapidly evolving technology and ensure students are using AI tools in a responsible and ethical manner. As lecturers in distance education, it is crucial to not only incorporate AI technology into teaching and assessment practices but also to educate students on how to use it appropriately to enhance their learning experience.

The use of ChatGPT in online assessment in distance education presents both challenges and opportunities, therefore its development and use must be approached cautiously. The theory of disruptive innovation emphasizes the need to adapt to changing technologies by incorporating them into pedagogical practices while maintaining academic integrity. Distance education institutions should be especially mindful of these implications and take proactive steps to ensure the responsible use of ChatGPT in their programs.

DISCUSSION

The ever-increasing encroachment of ChatGPT has become increasingly evident in HEIs. Within the Unisa community, which is the largest ODeL institution in Africa, an urgent concern is the impact of ChatGPT in online assessment. Considering this, this conceptual article endeavors to provide a discussion into the prospects of online assessment in distance higher education; specifically, what does the future hold for online assessment in higher education in an ODeL university in the context of ChatGPT? We used Christensen's theory (1997) of disruptive innovation to theorize the potential and possible disruption of ChatGPT for online assessment, we interrogate the ethical and pedagogical implications of ChatGPT for online assessment, and we conclude this article with recommendations for the use of ChatGPT based on these implications.

The potential of ChatGPT to pass an English comprehension examination, an MBA course and a medical examination (de Winter, 2023; Kung et al., 2022; Terwiesch, 2023) becomes a disruption for online assessment because it can create an opportunity for cheating and plagiarism. This highlights the need for lecturers to re-look at the types of questions that have dominated their online assessments in the past. In the context of ChatGPT, lecturers need to consider asking questions that will not be easily answered by ChatGPT. These questions may include historical or contextual information after the year 2021, as this information cannot be accessed on ChatGPT-3.5 (Visagie, 2022). Furthermore, questions requiring personal reflection or specific contextual information that require the use of critical and creative thinking should be asked of students to ensure authentic responses. Although other types of assessment such as group discussions, oral presentations, and peer assessment can be considered to prevent the use of ChatGPT, these types of assessment will not work in our context at Unisa as some of our modules have more than 20,000 students.

Another potential of ChatGPT is its ability to grade students' work and provide immediate feedback (Kasneci et al., 2023). This implies that ChatGPT can do the assessing and lecturers do not have to assess their students' work. This will move assessment from human-centered to machine-centered, altering the traditional mode of assessment. Automated grading will be beneficial in a context such as ours with large modules. Not only will it save time, money, and resources, but it will also eliminate human bias and human error in the grading process. Above all, it will ensure better consistency as large modules make use of multiple assessors who require constant monitoring and the moderation of their assessment to ensure consistency. Using ChatGPT to grade assessments may disrupt the employment of many contract assessors. The loss of income to assessors will be seen as technology taking over their jobs. We experienced this during COVID-19 when we

moved from venue-based examinations to online examinations, and all face-to-face invigilator contracts were terminated. What then would this imply for our online external assessors?

The use of ChatGPT in online assessment represents a potentially disruptive innovation in higher education, which has both positive and negative implications for academic integrity (Elkin & Chun, 2020; Guo, et al., 2023; Kerrigan et al., 2022; Manocha et al., 2022; Nisar & Aslam, 2023). While ChatGPT has the potential to enhance online assessment by providing students with access to information and resources, promoting academic integrity, and improving the efficiency and accuracy of assessment, we note that it also has the potential to undermine academic integrity by enabling cheating and plagiarism. At Unisa, a large proportion of our student body comprises students who speak English as an additional language. The convenience and accessibility offered by ChatGPT may be particularly alluring to such students, who may lack confidence in their language proficiency. As a distance education university, identifying whether a student has used ChatGPT to generate responses can be challenging due to the large enrolment numbers and the limited knowledge of students' language abilities. It is thus the responsibility of lecturers to scrutinize the utilization of ChatGPT and other AI-powered tools in HEIs. This must include a comprehensive consideration of the ethical implications of their use, ensuring responsible and constructive integration of these tools to produce favorable outcomes for both students and HEIs. The theory of disruptive innovation can provide a useful framework for examining the potential impact of ChatGPT on traditional methods of assessing and learning in higher education, and for considering the potential ethical implications of its use. Ultimately, the responsible use of ChatGPT and other AI tools in higher education can help to transform the way students learn, research, and develop their skills, while maintaining academic integrity and promoting the highest standards of scholarship.

CONCLUSIONS AND RECOMMENDATIONS

ChatGPT represents a significant development in the field of online assessment, with the potential to disrupt traditional approaches and transform the way we teach and assess. The theory of disruptive innovation highlights the importance of adapting to changing technologies and incorporating them into assessment practices while maintaining academic integrity. Lecturers need to be aware of the potential of ChatGPT and other language models to automate tasks traditionally performed by humans and to encourage their responsible use. Future considerations of the use of ChatGPT in education will involve striking a balance between harnessing its potential to provide accessible, personalized, and affordable education, while also ensuring that academic integrity is not compromised. Distance education institutions will need to adapt their rules and advise their students on the appropriate use of AI tools like ChatGPT. As technology continues to advance, we can expect to see further disruption in this field, leading to more accessible, and affordable teaching and learning, and effective assessment methods. Ultimately, the development and integration of ChatGPT in assessment presents exciting opportunities and challenges for lecturers and students alike.

Distance learning universities like Unisa may particularly benefit from incorporating ChatGPT into their assessment practices to promote learning and help lecturers stay up to date with technology (Sharples, 2022). For example, in large modules, in the absence of face-to-face lecturers, distance education students could use ChatGPT to generate ideas for their writing assignments. Students could submit their writing prompts to ChatGPT, and the AI tool could generate suggestions for topics, outlines, and supporting arguments. This would help students overcome writer's block and produce high-quality assignments. This is especially useful when lecturers are not present to assist students qualitatively. Secondly, institutions like Unisa could provide students with access to ChatGPT for examination preparation purposes. Lecturers could create mock examination questions and students could submit practice questions to ChatGPT, which would generate responses based on the course content. This would help students assess their knowledge and identify areas that require further study. Thirdly, distance education institutions could use ChatGPT to detect plagiarism in student assignments. ChatGPT could benefit external markers if they compare a student's work against a database of existing literature and highlight any sections that are copied or paraphrased without proper acknowledgment. This would help external markers identify instances of academic misconduct and promote academic integrity. Fourthly, we could use ChatGPT to provide personalized feedback to students on their assignments. ChatGPT could analyze students' work and generate feedback based on specific areas of

improvement. This would help students understand their strengths and weaknesses and improve their writing skills. Finally, we could use ChatGPT to assist lecturers in assessing student assignments by providing a preliminary mark based on established criteria. This would help lecturers save time and ensure consistent assessment across multiple assignments. As with any technological innovation, its success will depend on its responsible development and use, which will require ongoing dialogue and collaboration between the academic community and technology developers.

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