




Chapter 8

Artificial Intelligence such as Generative Pretrained Transformer: Reimagining Online Assessment Methods

Elize C. du Plessis 

*Department of Curriculum and Instructional Studies
University of South Africa 
Pretoria, South Africa*

Introduction

Online assessment techniques have become increasingly popular recently, especially with the rise of COVID-19 (Coronavirus disease of 2019), since they offer practical and effective ways to access knowledge, skills, and competencies. 2023 will go down in history as the year in which AI (artificial intelligence) – more significantly, LLMs (large language models) – and their brazen poster child, ChatGPT (chat generative pre-trained transformer), have revolutionised everything (Bekker 2024). The introduction of advanced LLMs like ChatGPT, developed by OpenAI, can potentially transform online assessment significantly. However, while there are ongoing discussions about ChatGPT, more practical examples need to be provided to showcase its utilisation in online assessments. It is crucial to shed light on the assessment process, as many students focus solely on passing exams rather than embracing the learning experience throughout the year, leading to a disconnect between the process and the outcome (MacGregor 2023).

Thanks to the swift growth of AI, the current field of education has access to brand-new, cutting-edge solutions. ChatGPT, a LLM that can create text that resembles human language and participate in interactive conversations, is one

such technology. Incorporating ChatGPT and other related LLMs replaces intriguing opportunities and challenges as online assessment becomes more common. Combining AI and LLMs like ChatGPT introduces a revolution in online assessment. AI-powered applications enable automated grading and individualised feedback and improve efficiency (Celik, Dindar, Muukkonen, & Järvelä 2022:617). However, integrating AI-powered tools raises concerns and challenges about the fairness, validity, and originality of material accessed in online learning environments (Hoyos 2023). For instance, ChatGPT is built on OpenAI ChatGPT 3, which can create narratives, develop computer codes, translate and complete calculations, and autofill images (Rudolph, Tan, & Tan 2023:342). This chapter examines the potential effects of adopting ChatGPT in online assessment by considering its benefits and potential drawbacks for educators and institutions. The chapter also suggests potential answers to address these problems and propose strategies for online assessment.

Conceptual Framework

Understanding ChatGPT and Online Assessment

GPT is a LLM utilised in various NLP (natural language processing) applications, including ChatGPT (Dheda 2023). GPT plays a vital role in ChatGPT by enabling the chatbot to generate responses that closely resemble human language when users interact with it. ChatGPT is a specific variation of GPT 3, an LLM developed by OpenAI (Cotton, Cotton, & Shipway 2023:1 of 12). Since its introduction in November 2022, ChatGPT has attracted much interest from the tech and media sectors. The transformer design is the foundation for GPT 3, which has become widely used in various NLP tasks (Cotton, Cotton, & Shipway 2023:1 of 12). With 175 billion parameters, GPT 3 stands out for its massive size, making it one of the most essential LLMs on the market today (Gpt Generative Pretrained Transformer, Thunström, & Steingrimsson 2022:3 of 7; Sümer 2023:2). It is well known for its ability to perform a wide range of language-related tasks, including translation, summarisation, question answering, and

text generation, frequently with little to no specialised training needed for each task.

Since its introduction, GPT 3 has been used in several fields, such as language translation, content creation, and language modelling. It is noteworthy that GPT 3 has proven to be highly accurate at translating across languages and producing cohesive and educational summaries of significant publications (Brown, Mann, Ryder, Subbiah, Kaplan, Dhariwal, Neelakantan, Shyam, Sastry, Askell, Agarwal, Herbert-Voss, Krueger, Henighan, Child, Ramesh, Ziegler, Wu, Winter, Hesse, Chen, Sigler, Litwin, Gray, Chess, Clark, Berner, McCandlish, Radford, Sutskever, & Amodei 2020:7). Furthermore, GPT 3's ability to comprehend and react to natural language inputs has been demonstrated by the development of chatbots that can talk with people and answer enquiries. The excellent abilities of GPT 3 have drawn much interest and inspired discussions on the prospective applications and effects of AI in language processing (Cotton *et al.* 2023:1 of 12).

Hsuan-Tien Lin, a professor in the Department of Computer Science and Information Engineering at NTU (the National Taiwan University), argues that when introducing ML (machine learning) to information retrieval or other fields, 'we need to be careful in understanding what the technique is about to ensure the best use' (Sharma 2024). Instead, many researchers rush to use ML without comprehensively understanding its techniques and limitations. They may not think clearly about training, validation, and test sets and 'end up with a rough instead of a rigorous use of machine learning methods' (Chih-Jen Lin, quoted in Sharma 2024). Sharma (2024) notes that '[t]he phenomenon of rough use of machine learning methods is common and sometimes unavoidable. AI moves quickly from research laboratories to real-world applications, yet ML models that work well in the laboratory can fail in real-world use, with essential consequences.'

It is crucial to understand ChatGPT's capabilities and constraints to gauge its possible influence on online assessment now that it is built on GPT 3.5 or GPT 4. Section 2 will give an overview of ChatGPT, highlighting its ability to produce

contextually appropriate responses and its potential to participate in interactive conversations. It also presents the idea of online assessment, which has grown in acceptance due to its practicality and scalability, underscoring the requirement for efficient and flexible assessment techniques.

The Benefits of ChatGPT in Online Assessment

Language formats like ChatGPT bring many advantages to online chat practice. One of the main advantages is the automatic grading, which allows for a better analysis of student responses. This feature allows for immediate feedback, thus reducing the workload of teachers (Wong 2023). In addition, ChatGPT can adapt to the needs of individual students, providing a personalised assessment that accommodates different learning styles and abilities (Ahmad 2023). The potential time and cost savings resulting from automated labelling can benefit educational institutions. Overall, ChatGPT provides benefits such as quick response, personalised viewing experience, and classification, helping to improve online viewing behaviour.

The type of language that AI provides has great value in supporting asynchronous communication. This ability allows students to participate in discussions and ask questions without the importance of real-time interaction, increasing students' collaboration (Bhosale, Pujari, Pujari, & Multani 2020:227; Li & Xing 2021:186, 187, 209). In addition, ChatGPT can improve communication between students by creating virtual different students, allowing them to work together (Lewis 2022:202). This promotes a sense of teamwork and collaboration among students. In addition, ChatGPT helps distance learning, which is especially useful for students who cannot attend physical classes due to health problems or other restrictions (Barber, Bird, Fleming, Titterington-Giles, Edwards, & Leyland 2021:106). These benefits demonstrate ChatGPT's ability to improve student engagement, collaboration, and accessibility in educational settings.

Limitations of ChatGPT and Similar Language Models

Ensuring the accuracy and validity of the monitoring process is very important. However, the integration of ChatGPT and similar language versions and projections introduce some challenges and weaknesses that must be addressed. One concern is bias because of the feedback from these types; the data may contain internal disturbances (Cotton *et al.* 2023:1 of 12). This raises questions about the validity and impartiality of the surveys conducted using AI-based tools.

Another challenge is the need for a more contextual understanding by LLMs like ChatGPT. While they excel at generating human-like text, they may need help to fully comprehend a given assessment task's nuances and specific context, potentially leading to inaccurate or inappropriate responses (Hoyos 2023). This limitation poses a risk to the validity of assessments that require a deep understanding of complex subject matter.

Furthermore, assessing higher-order thinking skills, such as critical thinking and creativity, can be challenging for AI-powered assessment tools. These skills often require complex reasoning and synthesis of information, which may require more work for current LLMs to accurately evaluate (Cotton *et al.* 2023:1 of 12). Thus, there is a need for careful consideration and development of appropriate assessment strategies that align with the desired outcomes.

Addressing these challenges and limitations is crucial to ensure the integrity and effectiveness of AI-powered assessments. Strategies such as fine-tuning models, incorporating human oversight, and continuous improvement of the training data can help mitigate biases and enhance contextual understanding. Additionally, exploring alternative assessment methods that capture higher-order thinking skills may be necessary to complement the capabilities of LLMs like ChatGPT.

According to Marr (2023), Chowdhury and Rahman (2023:7-10), and Karthikeyan (2023:284), ChatGPT has several drawbacks:

- Insufficient common sense: ChatGPT lacks human-level common sense and background knowledge despite its ability to produce human-like responses and have access to a tremendous amount of information. As a result, it could sometimes give illogical or incorrect answers to particular queries or circumstances.
- Lack of EI (Emotional Intelligence): ChatGPT lacks accurate EI, even though it can provide sympathetic replies. It is challenging to recognise tiny emotional cues or react correctly in emotionally charged circumstances.
- Contextual understanding limitations: ChatGPT has trouble comprehending context, especially regarding humour and sarcasm. It may be challenging to understand the subtleties of human communication, even though it is proficient in language processing. Consequently, it may be unable to decipher the intended meaning of amusing or caustic messages, resulting in inappropriate or irrelevant answers.
- Having trouble creating long-form, structured content: ChatGPT currently produces long-form, structured content. Although it may generate grammatically sound and meaningful phrases, producing lengthy content that follows particular formats, patterns, or narratives might be challenging. ChatGPT is therefore better suited to producing succinct content, such as summaries, bullet points, or succinct explanations.
- Multitasking limitations: ChatGPT functions best when concentrated on a single job or goal. It is challenging to prioritise activities when given several at once, which lowers accuracy and efficacy.
- Potential for biased responses: Because ChatGPT is trained on a sizable dataset that might include biases or prejudices, it may inadvertently produce biased or discriminatory responses.
- Limited knowledge: ChatGPT cannot acquire all human knowledge, even if it can access a substantial amount of data. It could have trouble responding to enquiries on highly specialised or narrow subjects, and it might not be current on the latest advancements or modifications in particular domains.

- Grammar and accuracy problems: ChatGPT's sensitivity to misspellings, typos, and grammatical errors is currently restricted. Furthermore, it could generate theoretically valid responses that are inaccurate or irrelevant in the context. This restriction is especially noticeable when handling specialist or sophisticated data where precision and accuracy are essential. It is best to use other methods to confirm the data produced by ChatGPT.

Awareness of these limitations is essential to evaluate ChatGPT's outputs critically and take the necessary steps to verify the information it provides. It is crucial to acknowledge and understand the significant limitations and drawbacks of ChatGPT despite its highly advanced capabilities. AlZu'bi, Mughaid, Quiam, and Samar (2023:3), as well as Hoyos (2023), highlight the following challenges and caveats associated with these models, particularly in an educational setting:

- *Reliability and accuracy*: ChatGPT is imperfect and may occasionally give inaccurate or deceptive information. Teaching students how to assess and validate their work critically by utilising additional trustworthy sources is essential.
- *Bias*: ChatGPT may produce biased results that reinforce negative stereotypes or prejudices because it is trained on data that may contain biases.
- *Dependency*: Students who rely too much on ChatGPT may find it challenging to analyse critically, solve challenges, and actively participate in class content. They could grow unduly reliant on the model for solutions and responses.
- *A lack of creativity*: Students may be deterred from applying their creative thinking and problem-solving skills if they use ChatGPT to write assignments or create presentation slides. It might discourage their creativity and prevent them from honing their abilities.
- *Security and privacy*: ChatGPT presents security and privacy issues in the classroom. Sensitive information may be shared or leaked, so the proper security measures must be taken.

- *Cheating*: ChatGPT may be abused for academic dishonesty, including directly copying sample responses or plagiarism. It makes maintaining fair evaluation procedures and academic integrity more difficult.
- *Technical troubles*: ChatGPT may experience technical problems like software compatibility or network connectivity concerns. These technological hiccups could negatively affect the learning environment in the classroom and make it more challenging to integrate the model.

Integrating ChatGPT and similar LLMs into online assessments requires careful consideration of the risks associated with security, privacy, and academic integrity. Safeguards should be implemented to address cheating, collusion, and unauthorised access to the models.

Professional Development and Training for Educators

It is increasingly difficult for expert educators to teach, especially if we look at online assessment. Educators need appropriate professional development and training to leverage ChatGPT and similar LLMs in online assessment effectively. This section emphasises equipping educators with the necessary skills to effectively understand and use AI-powered assessment tools. Professional development programmes can focus on AI literacy, assessment design, understanding model limitations, and promoting ethical practices in online assessment.

Improved Question-Answering Abilities

ChatGPT and similar LLMs exhibit exceptional skills in answering questions, empowering them to effectively comprehend and address various inquiries. Integrating these models into online assessments can introduce more interactive and dynamic question formats. This would enable students to receive personalised responses and immediate feedback, fostering an enhanced assessment experience that encourages deeper learning (Lin, Cao, Zhang, Chen, Hong, Xu, & Tan 2022).

Personalised Assessments

LLMs such as ChatGPT hold promise in facilitating personalised assessments by adapting the difficulty level and content of questions to align with each student's performance and learning requirements (Sümer 2023). Through analysing students' responses, these models can generate suitable follow-up questions, allowing for a more precise assessment of their knowledge and abilities. By employing personalised assessments, a more precise depiction of students' capabilities can be achieved, along with targeted interventions to facilitate their improvement.

Automated Evaluation and Feedback

One of the notable impacts of LLMs on online assessments is their potential for automated evaluation and feedback. ChatGPT and similar models can analyse students' responses, detect patterns, and provide immediate feedback on objective and subjective questions. Automated evaluation saves educators time, allowing them to focus on other teaching aspects while providing timely feedback to students and facilitating quicker learning iterations (Messer 2022).

Mitigating Bias and Standardising Assessments

Online assessments often encounter challenges associated with bias and subjectivity in grading. LLMs can assist in addressing these concerns by offering standardised and objective evaluation criteria. Training the models on diverse datasets and adhering to ethical guidelines make it possible to reduce assessment bias and ensure equitable evaluation for all students. However, caution must be exercised to prevent the incorporation of any existing biases present in the training data (Cotton *et al.* 2023:9 of 12).

Opportunities/Implications for Educators

ChatGPT could offer many opportunities for HE (higher education) students and educators. The next sections describe the vital opportunities of ChatGPT for HE (Farrokhnia, Banihashem, Noroozi, & Wals 2023:4-6 of 15).

Increasing Accessibility of Information

ChatGPT can provide instructors and students convenient access to information in various subjects and platforms (such as websites or smartphone apps). Additionally, because it allows for a written response rather than merely a list of sources, it is a more effective tool than conventional search engines. Students can more easily and quickly access fine-grained information thanks to ChatGPT's ability to locate and summarise pertinent material (Casella, Montomoli, Bellini, & Bignami 2023:2). From a teaching standpoint, ChatGPT can free up students' access time so they can read and think critically longer about the assigned material. Educators can find and create suitable teaching materials with the help of ChatGPT. With a set of parameters and restrictions, it can also assist them in creating lesson plans for instruction (Zhai 2022:5 of 18). For instance, based on CAPS (the South African curriculum and assessment policy statement), the author requested that ChatGPT develop a lesson plan for Grade 10 Life Orientation. The following plan, which centres on the subject of *Career development and planning*, was produced in a matter of seconds:

Grade Level: Grade 10

Subject: Life Orientation

Topic: Career Development and Planning

Duration: 2 lessons (90 minutes each)

Lesson 1: Exploring Career Options

Objective: By the end of this lesson, students should be able to identify and describe various career options and understand the importance of career planning.

Materials Needed:

- Career pamphlets, books, or online resources.
- Whiteboard and markers.
- Computer and projector (optional).

Lesson Structure:

Introduction (15 minutes):

- Welcome the students and explain the lesson objectives.
- Discuss why career planning is essential and how it can impact their future.

Activity 1: Career Exploration (30 minutes):

- Divide the class into small groups.
- Provide each group with career pamphlets, books, or access to online career resources.
- Instruct students to research and identify at least three different careers they find interesting.
- Ask each group to prepare a short presentation about these careers, including job descriptions, qualifications, and potential earnings.
- Groups present their findings to the class.

Discussion (20 minutes):

- Lead a class discussion on the career options presented.
- Encourage students to share their thoughts on which careers appeal to them and why.
- Discuss the importance of considering personal interests, skills, and values when choosing a career.

Homework (5 minutes):

Assign students to write a short reflection on one career they found exciting and why they think it might be a good fit.

Lesson 2: Career Planning and Goal Setting

Objective: By the end of this lesson, students should be able to create a basic career plan and set achievable career goals.

Materials Needed:

- Whiteboard and markers.
- Career planning worksheets (prepared in advance).
- Computer and projector (optional).

Lesson Structure:

Introduction (10 minutes):

- Review the previous lesson's key points about career exploration.

Activity 1: Career Planning (40 minutes):

- Distribute career planning worksheets to each student.
- Guide students through the process of creating a basic career plan, which should include:
 - Their career goals (short-term and long-term).
 - The steps they need to take to reach those goals.
 - Necessary qualifications and skills.
 - Potential challenges and how to overcome them.
- Encourage students to think about the importance of education and training in their chosen career paths.

Discussion (20 minutes):

- Ask students to share their career plans with the class.
- Discuss the importance of setting SMART (Specific, measurable, achievable, relevant, time-bound) goals.
- Talk about the role of perseverance and adaptability in achieving career goals.

Conclusion (5 minutes):

Summarise the lesson's key points and emphasise the importance of continuously revisiting and updating their career plans.

Homework (5 minutes):

Assign students to refine their career plans based on class discussion and to set specific, measurable short-term goals to work towards in the coming weeks.

Assessment:

Assessment for this unit could include reviewing students' career plans and the goals they have set for themselves, as well as their participation in class discussions and activities.

This lesson plan should help Grade 10 learners to start their journey towards understanding different career options and the importance of planning and setting goals for their future careers. The challenge is for educators to critique the lesson plan from what is to what ought to be.

Facilitating Complex Learning

Previous research has highlighted the potential of AI tools in supporting the development of complex learning tasks, including language learning (Jia, Sun, Ma, & Looi 2022:2, 3 of 18) and critical thinking (Hapsari & Wu 2022:444). ChatGPT, as an ITS (intelligent tutoring system), shares this potential by offering personalised instruction and feedback to students regarding complex tasks such as academic writing skills (Zhai 2022:10 of 18) and programming skills (Biswas 2023:11). Additionally, ChatGPT has demonstrated its ability to stimulate critical thinking in students by presenting them with tailored sets of questions based on their proficiency level (Cotton *et al.* 2023:2, 5 of 12).

Acting as an intelligent conversational agent, ChatGPT also provides valuable opportunities for students to enhance their argumentation skills through low-stakes practices. For instance, students can present their points of view while asking ChatGPT to take the opposite side, engaging in a debate-like conversation (Bayat, Banihashem, & Noroozi 2022:350). Moreover, like other pre-trained language representation models (cf. Jia, Cui, Xiao, Liu, Rashid, & Gehringer 2021:6), ChatGPT can assist students in evaluating peer assessments, enabling them to enhance their feedback-giving abilities.

Decreasing Teaching Workload

ChatGPT possesses significant potential to reduce educators' workloads substantially. As an example, it can be utilised as a feedback tool to guide students' tasks, essays, and assignments (Qadir 2022:1). By engaging ChatGPT, educators can request the formation of diverse test formats, including open-ended questions, multiple-choice questions, or even rubrics for evaluating students' assignments (Zhai 2022:1, 2, 6 of 18). In the realm of text-based courses, ChatGPT could be employed for the

automated grading of assignments, offering a beneficial solution (Cotton *et al.* 2023:3 of 12). Additionally, educators can efficiently provide students with timely feedback on their essays (Mizumoto & Eguchi 2023:2 of 40).

Challenges of Online Assessment in Higher Education

The emergence of ChatGPT and related chatbots offers the industry yet another chance to consider why and how it evaluates – and what HE is for. ChatGPT poses an existential danger if the goal of HE is for students to learn and summarise a body of information, with certification obtained through assessment. If institutions are no longer able to firmly claim that the texts evaluated by scholars were actually written by their students, the market worth of credentials is directly endangered.

Even though ChatGPT and other LLMs have ample potential advantages for evaluation in HE, there are also some significant obstacles that they might present. The potential for plagiarism is one issue when utilising GPT 3 for HE assessments. AI essay-writing programmes are created to produce essays in response to prompts or other conditions. This implies that students might submit writings that are not their own, in this way cheating on their assignments by using these systems (cf. Dehouche 2021:18). This could ultimately result in a devaluation of degrees and undercuts HE's core mission of challenging and educating students.

Another challenge is that some students could use GPT 3 to unfairly advantage themselves over others. For instance, if a student utilises GPT 3 to produce high-quality written assignments, they may have an unfair edge over their peers who lack access to the model. This situation could result in disparities in the evaluation process.

It may be challenging to differentiate between a student's writing and the output created by a chatbot application. Educators might struggle to effectively evaluate the student's grasp of the material when they employ a chatbot to answer their questions. This is because the replies generated by the chatbot do not truly

reflect the student's comprehension level (Cotton *et al.* 2023:3 of 12).

Discussion and Strategies on the Use of ChatGPT in Online Assessment

An essential component of HE is assessment, used to gauge students' learning and development. A vast array of learning outcomes, including knowledge, abilities, and attitudes can be evaluated using a variety of assessment formats, such as exams, papers, projects, and presentations. Developing customised tests is one possible use for GPT 3 in HE. According to each student's unique requirements and skills, GPT 3 could be used to create tailored tests or quizzes (Barber *et al.* 2021:24; Zawacki-Richter, Marín, Bond, & Gouverneur 2019:4). GPT 3 could be used to develop questions that are specific to each student's level of proficiency and that challenge them to exhibit their knowledge and skills, which could be especially helpful in courses that emphasise language skills or critical thinking (Bommasani, Hudson, Adeli, Altman, Arora, Von Arx, Bernstein, Bohg, Bosselut, Brunskill, Brynjolfsson, Buch, Card, Castellon, Chatterji, Chen, Creel, Davis, Demszky, Donahue, Doumbouya, Durmus, Ermon, Etchemendy, Ethayarajh, Fei-Fei, Finn, Gale, Gillespie, Goel, Goodman, Grossman, Guha, Hashimoto, Henderson, Hewitt, Ho, Hong, Hsu, Huang, Icard, Jain, Jurafsky, Kalluri, Karamcheti, Keeling, Khani, Khattab, Koh, Krass, Krishna, Kuditipudi, Kumar, Ladhak, Lee, Lee, Leskovec, Levent, Li, Li, Ma, Malik, Manning, Mirchandani, Mitchell, Munyikwa, Nair, Narayan, Narayanan, Newman, Nie, Niebles, Nilforoshan, Nyarko, Ogut, Orr, Papadimitriou, Park, Piech, Portelance, Potts, Raghunathan, Reich, Ren, Rong, Roohani, Ruiz, Ryan, Ré, Sadigh, Sagawa, Santhanam, Shih, Srinivasan, Tamkin, Taori, Thomas, Tramèr, Wang, Wang, Wu, Wu, Wu, Xie, Yasunaga, You, Zaharia, Zhang, Zhang, Zhang, Zhang, Zheng, Zhou, & Liang 2021:29).

Developing interactive, game-based tests is another possible use for GPT 3 in HE. Chatbots or virtual assistants that push students to solve challenges or respond to enquiries using natural language interaction could be developed using

GPT 3. In addition to teaching students useful communication and problem-solving skills, this might be an entertaining and exciting opportunity for them to demonstrate their knowledge and abilities. Students can receive personalised answers to their enquiries and instant feedback from chatbot applications. These chatbots may also personalise the educational process by suggesting books and websites based on students' interests and requirements. To help students better understand the topic, chatbot applications can also offer educational resources like study guides and lecture notes (Perez, Massey-Allard, Butler, Ives, Bonn, Yee, & Roll 2017:290; Cotton *et al.* 2023:2, 7 of 12).

A more effective and individualised learning experience could be made possible by using ChatGPT to assess assignments and give students feedback in real-time (Gao 2021:322-324; Cotton *et al.* 2023:3, 5 of 12; Zawacki-Richter *et al.* 2019:4). GPT 3, for instance, might be used to grade essays and other written work, freeing up educators to concentrate on higher-level duties like giving students feedback and support. Additionally, GPT 3 could be used to grade tests or quizzes more rapidly and precisely, giving students feedback in real-time (Cotton *et al.* 2023:2 of 12).

Due to the difficulties in assessing student submissions generated by ChatGPT, there are various strategies that educators can employ to address these issues. As a starting point, instructors can offer comprehensive and explicit guidelines to students organising their assignments (Barile 2023). They might also utilise straightforward and specific language, reiterate instructions detailing the objective of the task, and include examples. This approach can help to ensure that assignments are composed in a more organised and logical fashion. Additionally, educators can implement a rubric to assess the quality of students' work. Rubrics establish a clear set of evaluation criteria for measuring performance across various activities, including assignments, presentations, and overall productivity. Rubrics typically include criteria, performance levels, and descriptors (Leadership Workshop 2012). This approach aids in accurately evaluating a student's effort and comprehension of the subject matter. Additionally, educators are able to apply automated and manual assessment methods to gauge the student's grasp of the material

(Cotton *et al.* 2023:5 of 12). This ensures that the true extent of the student's understanding is effectively assessed.

Additionally, academic personnel should search for linguistic abnormalities or patterns: Because chatbots frequently have low language skills, they may produce more human-like content, contain repetitious words or phrases, or use strange or inconsistent terminology. One way to determine whether a chatbot created a piece of writing is to look at its language (Sümer 2023).

Chatbots cannot generate novel concepts or conduct original research. Consequently, it is doubtful that material produced by a chatbot will contain accurate citations or references to sources (Gewirtz 2023). One way to determine if a chatbot wrote a piece of work is to look at its sources and citations. Educators therefore ought to verify originality. Chatbots cannot produce original work. As a result, anything produced by a chatbot is probably going to be rather similar to previously published sources. It is possible to determine whether a chatbot most likely created a piece of writing by using plagiarism detection software or manual examination to check for originality (Gewirtz 2023).

Although LLMs can produce writing that makes sense, they might only sometimes do so. Examining the essay for factual mistakes or discrepancies may reveal that it was written by a machine (Cotton *et al.* 2023:5 of 12). The educator should also check grammar and spelling: AI-generated writing may be more error-free than human writing, which may contain typos and grammatical faults. However, the quality of the LLM and the input data used to train it can affect this (Sümer 2023).

It is advisable to employ language analysis tools because some of them (like the GPT 2 output detector demo) are made to examine written work and identify patterns or abnormalities that could suggest that a chatbot created the work (Cotton *et al.* 2023:4 of 12; Sümer 2023).

When creating scenarios for real-world case study-based tests, academic users may also find it very useful, particularly if students utilise ChatGPT to create the unique situation to which their test would react (Saunders 2023). Since the exam is custom-

made and student-generated, all of these requirements help to ensure its validity and guard against plagiarism and other academic integrity violations.

A few crucial tactics can be used by university personnel to create tests that discourage or limit students' use of ChatGPT. One strategy is to design tests that demand students to show their ability to think critically, address challenges, and communicate. For instance, educators could create exams that require students to participate in group debates, presentations, or other interactive activities that require applying their knowledge and skills instead of just asking them to write an essay on a given subject. This would encourage critical thinking and self-directed learning while making it more challenging for students to finish tasks using ChatGPT or other LLMs.

Accurately citing and referencing other people's work is expected of academic writing, including in-text citations and a list of references after the work. This promotes the legitimacy and dependability of the research and aids in acknowledging the original writers. Because ChatGPT and other LLMs might not have access to the same information sources or could need to be configured to style citations and references correctly, their output might need to contain proper referencing.

Developing open-ended tests and promoting creativity and originality are further tactics. Educators could, for instance, provide tests that require from students to formulate their research topics, to formulate and support their positions, or to come up with unique ideas and exercise critical thought. As a result, students may find it more challenging to use ChatGPT to finish their assignments. Lastly, to ensure that students are not using LLMs during assessments, the educator should employ proctored or real-time exams (Cotton *et al.* 2023:5 of 12).

There are numerous intriguing instances of ChatGPT's possible applications, fantastic usage, and benefits in the academic setting. Among them are the following:

- *Automated grading and feedback:* ChatGPT can score test responses, essays, and assignments and give students tailored feedback.

- *Question-answering tool*: By allowing students to utilise ChatGPT to ask questions and get information about course materials, educators can save time by not having to repeatedly respond to the same questions.
- *Writing and language coaching*: Students can enhance their language and writing abilities by using ChatGPT's writing, grammar, and vocabulary recommendations.
- *Study aid*: By offering explanations and responding to enquiries with remarkable speed and accuracy, ChatGPT can assist students to comprehend and retain information.
- *Group projects*: By assisting students in working together on idea generation, research, planning, and organisation, ChatGPT can support group projects.
- *Presentation tool*: ChatGPT can produce presentation slides and other materials, assisting students in effectively expressing their thoughts.
- *Virtual tutoring*: For students who require more assistance, particularly those enrolled in online or distant learning environments, ChatGPT can offer virtual one-on-one tutoring (Hoyos 2023). ChatGPT is a tool that facilitates communication and can be used as a peer in education because learning can take place asynchronously, without people physically meeting in person.

In light of these, educators could use ChatGPT in various ways to push students to acquire and hone their personal critical thinking abilities.

First, with questions like 'How could you apply your past knowledge and abilities to address this new challenge?' students are encouraged to think critically and solve difficulties by asking follow-up questions like 'What strategies would you use to overcome any obstacles?' Second, educators can routinely evaluate students' strengths and areas for improvement by utilising ChatGPT to build quizzes and assessments that gauge students' comprehension of the subject matter. Third, ChatGPT may create assignments that are differentiated based on the requirements and skills of each student, giving them progressively more complex assignments to push them. To provide students

with high-quality examples, ChatGPT can also generate samples of excellent responses to tasks and assignments (Viljoen 2023).

Students in HE must actively engage with the material, critically reflect on their experiences and perspectives, relate the material to their personal and professional objectives, and synthesise new ideas and information to make meaning from it. Writing about their comprehension, applying what they have learnt to real-world situations, making visual aids or summaries, and discussing the learning material with others are some of the activities. Additionally, students' perspectives can be widened and their knowledge deepened by actively searching and exposing them to various viewpoints.

LLMs significantly impact traditional teaching and learning approaches, and this development has led to a shift towards more experiential and student-centred learning approaches. Project-based learning is one example, which pushes students to use their knowledge and abilities to address challenges and complete projects in the real world. As a result, project-based learning gives students a context for their abilities and teaches them how to use them in practical situations.

Collaborative learning is another idea that is accomplished through teamwork and group projects. Students can use their knowledge and learn from one another in a dynamic and encouraging collaborative environment. Through practical and hands-on experiences like field excursions, job placements, and simulations, experiential learning (work-integrated learning) techniques enable students to apply their knowledge in real-world situations.

Finally, since it can be argued that technology can be used as a tool to facilitate learning and problem solving, incorporating technology into the educational process – such as gamification, AI, VR (virtual reality), and AR (augmented reality) – is an additional component in achieving this change (Viljoen 2023).

Responses from Questions Posted to Online Educators: Strategies for Online Assessment

The author sent five questions about ChatGPT and online assessment to 10 online educators. The answers can be summarised as follows:

How can integrating ChatGPT in online assessments enhance the assessment of education and training programmes?

ChatGPT can provide personalised and interactive student assessment experiences through the chatbot interface. The chatbot interface allows for real-time engagement in which students can demonstrate their knowledge and skills. ChatGPT can also simulate different types of classroom scenarios and can enable students to practise their instructional strategies and classroom management skills. This will provide a realistic and immersive assessment of their readiness to become effective educators. Furthermore, ChatGPT can offer immediate feedback – ChatGPT offers diverse perspectives when giving feedback. It can quickly assist both students and educators with quick prompts.

What are the potential benefits and drawbacks of using ChatGPT for online assessment in education?

Using ChatGPT offers the following benefits: First, it can provide immediate and consistent feedback to students and enhance their learning experience. Second, it allows for assessing a wide range of skills, including communication, problem-solving, and critical thinking, which are crucial for effective teaching. Third, it can reduce the administrative burden on educators by automating grading and assessment processes.

The drawbacks may be the potential for biases in AI scoring that may not accurately reflect an educator's abilities to assess students. Also, relying solely on LLMs for assessment may undermine the importance of human judgement and the contextual understanding educators must apply in real-life classroom settings. Moreover, ChatGPT might not consider the African context or perspective in which this continent's educators operate. While it can be a valuable resource for fostering critical

thinking skills, educators and tutors should be mindful that the chatbot's knowledge might not fully align with the specific cultural, social, and educational nuances prevalent in South Africa and other African countries. It is crucial for educators and tutors to supplement ChatGPT's insights with localised and culturally relevant content and discussions, ensuring that educator training programmes are inclusive and attuned to the unique needs and challenges faced by educators in the African context.

How can ChatGPT effectively assess and evaluate the critical thinking skills of educators teaching students in online settings?

ChatGPT can provide various scenarios or case studies related to teaching and education. Students can use ChatGPT as a conversational agent to discuss and analyse the provided scenarios or case studies and demonstrate their critical thinking skills. Educators and tutors can use ChatGPT to pose open-ended questions or address challenges for students using essential strategies of thinking. By analysing the responses and interactions using ChatGPT, educators and tutors can assess students' ability to think critically, analyse information, and provide well-reasoned arguments or solutions. The assessment should have assessment criteria that can be used to evaluate the responses of the student.

What ethical considerations should educators consider when utilising ChatGPT for online assessment in educator training programmes?

Educators should be aware of potential biases embedded in AI models, as these biases may unfairly advantage or disadvantage certain students, perpetuating existing inequalities. Ensuring that the AI system is trained on diverse and representative data is crucial to minimise bias. Second, privacy concerns arise when collecting and analysing data from students. Educators must obtain informed consent, protect sensitive information, and establish apparent data retention and usage policies to safeguard privacy.

Moreover, using LLMs may depersonalise the assessment process, potentially diminishing the importance of individualised feedback and human interaction in education. Educators must strike a balance between AI-driven assessment and personalised mentoring to maintain the quality of educator training. Additionally, transparency is vital. Educators should disclose the use of LLMs and its role in assessment to students, fostering trust and ensuring that they understand how their performance is evaluated.

Lastly, educators must continuously monitor and evaluate the LLM's performance to address emerging ethical concerns and adapt their practices accordingly. Overall, ethical considerations in using ChatGPT for online assessment in educator training programmes require a thoughtful and proactive approach to ensure fairness, privacy, transparency, and the preservation of personalised education.

How can the use of ChatGPT in online assessment contribute to the professional development of aspiring educators and improve the quality of their training?

ChatGPT can offer immediate and personalised feedback, enabling students to identify areas for improvement in real time. This continuous feedback loop fosters a more responsive learning process. It can also simulate various classroom scenarios, allowing trainees to practise their teaching skills in a safe and controlled environment. This experiential learning boosts students' confidence and helps them to develop effective classroom management techniques. Additionally, ChatGPT can assess and guide soft skills such as communication, empathy, and adaptability, which are critical for successful teaching but are often challenging to evaluate objectively. Furthermore, the scalability of online assessment with ChatGPT means that a larger pool of aspiring educators can benefit from high-quality training resources and assessments.

The data collected from these assessments can inform programme improvements, ensuring that educator training is responsive to evolving educational needs. ChatGPT's integration

into online assessment has the potential to transform education, offering more tailored, immersive, and data-driven training experiences that can significantly improve the quality and effectiveness of educator training programmes.

Conclusion

Integrating advanced LLMs like ChatGPT into online assessments holds immense potential to revolutionise how we evaluate knowledge and skills. From adaptive assessments to automated grading and feedback, these models can enhance student and educator assessment experiences. However, careful attention must be given to addressing challenges such as bias, reliability, security, and privacy. Collaboration between researchers, educators, and policymakers is necessary to leverage the benefits of LLMs while upholding ethical standards and ensuring the fairness and validity of online assessments.

Instead of marking the conclusion of HE, ChatGPT has offered the sector, and society at large, a valuable opportunity. This is a chance to create innovative and inclusive approaches to teaching, learning, and assessment that correspond with these new understandings. Additionally, many scholars argue that educators should integrate new technologies into the educational experience. Universities and faculty members can and ought to do just that with Gen-AI technology. They should investigate it, identify its limitations, evaluate its potential applications within the relevant disciplines or teaching contexts, and engage in discussions about all these aspects with students, who are likely already familiar with the technology.

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Chapter 8

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