



ChatGPT and higher education assessments: More opportunities than concerns?

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Abstract

In recent times, higher education has seen a growing concern regarding the utilisation of artificial intelligence, especially with the emergence of ChatGPT. This technology can generate written content and respond to queries at a level that is nearly indistinguishable from a human writer. This feature has drawn substantial interest from students in higher education and has led to concern that students will use ChatGPT's capabilities to cheat on written formative and summative assessments. In this paper, we will review the usage of ChatGPT in higher education assessments and investigate why students want to cheat using artificial intelligence capabilities. It also offers a critical perspective on the challenges associated with detecting ChatGPT-generated content and its impact on academic integrity. We also consider whether artificial intelligence provides more opportunities for academics to focus on assessing higher-order thinking and strategies.

Keywords: Academic integrity; artificial intelligence; assessments; ChatGPT; higher education; learning and teaching; quality assurance.

Introduction

The timely assessment of student learning is a vital aspect of the teaching and learning process as it enables instructors to link the effectiveness of their teaching with student achievement of learning objectives. Moreover, it provides useful feedback to teachers and students about the extent to which they succeed in their teaching and learning mission. Hence, the accuracy of the assessment outcome is a crucial factor since the result would reflect the behaviour of both the teacher and the student in academia. However, recent studies have shown that the reliability of the test results is

threatened as assessment cheating has become one of the major problems on many university campuses (Wang et al., 2015; Odongo et al., 2021).

Although cheating is considered an act of academic dishonesty, methods of cheating keep evolving rapidly by many means and ways, and students continue to cheat in their assessments. As far as cheating methods are concerned, almost all the methods are commonly used worldwide. In line with previous studies, academic dishonesty has several classic forms: plagiarism, reusing or resubmitting one's paper, cheating on an examination, fabricating information, collusion or illegitimate cooperation, contract cheating, impersonation, copying, and ghost-writing (Gamage et al., 2023). Different taxonomies have been used to group these dishonest behaviours, and Faucher and Caves's (2009) classification includes three categories: information exchange among students using forbidden materials and circumventing the assessment process.

With the arrival of the information age and digital technologies, new teaching and learning methods and systems have entered the education contexts while the existing ones are being improved or removed. Parallel to that, new evaluation methods and tools were also introduced to the system. However, studies have shown that new technologies inspired academic cheaters to develop new cheating methods (Wang et al., 2015; Odongo et al., 2021; Keresztury & Cser, 2013). Especially in online environments, students have come up with several techniques to cheat; for example, "students wait for answers, claim fraudulent error messages, collusion, essay plagiarism, and buying answers" (Moten et al., 2013, p. 142). According to the literature, another dimension of technological development of artificial intelligence was introduced in the late 1950s (Manning, 2020). Some researchers date 1955 as the year that John McCarthy coined the concept of artificial intelligence as "the science

and engineering of making intelligent machines” (Manning, 2020, p. 1; Jantakun et al., 2021). UNESCO (2019) states that 1956 was the year when the introduction of AI happened at the Dartmouth Conference, and since then, it continued making the lives, working, and studying of mankind much more convenient. AI’s ability to enable a machine to think and act like a human has gained the interest of every field and industry, including healthcare, finance, transportation, agriculture, media and communication, and entertainment. Furthermore, AI applications have also been introduced into education and are now functioning at different stages of the teaching-learning process and assessment, transforming traditional practices.

Accordingly, AI and its applications in education are advancing significantly in response to teaching, learning, and assessment from elementary to higher education levels. On the other hand, its influence on how graduates develop the competencies necessary for survival and success in the future professional world is debatable. These debates have substantially intensified with the recent introduction of ChatGPT – a conversational language model or a chatbot, another forward step of AI. Universities worldwide are concentrating more and more on ChatGPT’s potential to change future higher education teaching and learning practices (Lim et al., 2023). There are many possibilities for this technological advancement to improve and change the way we interact with technology in the context of higher education. In light of the claim that there are more opportunities than problems with using ChatGPT in evaluations for higher education. Using AI-powered technology to enhance student learning, encourage innovation, and deliver personalised feedback while addressing possible ethical and dependability problems presents an opportunity to reimagine the assessment process radically. The current study reviews the usage of ChatGPT in higher education assessments and:

- Investigates why students want to cheat using artificial intelligence capabilities;
- Identifies the challenges associated with detecting AI-generated content and its impact on academic integrity; and
- Identifies the need for re-designing assessments in parallel to technological advancement.

Assessment and artificial intelligence

This section includes how learning and teaching in education connect with artificial intelligence and ChatGPT.

Artificial Intelligence

AI is defined as the ability of machines and systems to acquire and apply knowledge and to carry out intelligent behaviour (OECD, 2016; UNCTAD, 2017). However, in the recent past, it seems to get closer to the capacity of human intelligence. As a result, AI is now being used in every field, including education, to perform human-oriented work: automation, personalisation, prediction, optimisation, decision-making,

robotics, natural language processing and translation, and visual and voice recognition. Moreover, it comes in several ways, with computer programs, software, and embedded control systems in equipment and robots (Jantakun et al., 2021).

There is no universally agreed definition of AI (ESCAPE, n.d.), and several definitions are found in different academic literature, varying more or less from each other depending on the context. Broadly, AI has been defined by considering four dimensions: Thinking humanly, reasoning, acting humanly, and acting rationally (UNESCO, 2019). AI has played a large role in digital transformation and is felt globally. As an emerging novel technology, the integration of AI into education (Artificial Intelligence in Education – AIED) arose as an interdisciplinary subfield in the early 1980s (Baker, 2021). It has opened up new paths and started modifying educational tools and institutions (Kengam, 2020) with the advancements in the 1980s and 1990s. Further, new potentials for learning technologies in several areas have been identified (Baker, 2021). AI is a continually evolving field, and understanding the potential impact of these changes and advancements on future teaching and learning will bring education a long way forward.

Artificial intelligence and education (AIED) are driven in many ways, from the classroom to the entire school administration system. Not only in teaching, AI is used to cover non-teaching aspects at the school level. For example, several independent and public schools in England use an AI tool to forecast eating disorders, drug usage, and self-harm (Kengam, 2020). Baker & Smith (2019) divided and described AIED implementations into three groups: learner-oriented AIED, instructor-oriented AIED, and institutional system-oriented AIED (Baker & Smith, 2019). In the early stages of its growth, AI in education was mostly connected with intelligent tutoring systems. Subsequently, it demonstrated greater efficiency in helping learners identify knowledge gaps and personalised support (Jantakun et al., 2021) and the gaps in teaching (Kengam, 2020). Concerning teaching from the teachers’ point of view, AI reduces the teaching workload, improves information literacy, and is helpful to their professional development (Xue & Wang, 2022).

AI primarily uses advanced analytics, deep learning, and machine learning to track how quickly one person moves relative to others. Today, AIED systems have a variety of functions for recognising the learner’s traits as well as a variety of ways to engage and react to learners (Baker, 2021) to simulate and predict learning processes (Rienties et al., 2020). For example, in personalised learning, students experience a unique educational approach that meets their needs and skills completely. AI analyses student performance data and makes recommendations and suggestions based on a student’s strengths and weaknesses. This would help students to reach their full potential and reduce drop-out rates.

Among the novel trends for using AI-enabled technology in educational assessment (formative and summative), contexts are increasing: Automated Essay Scoring (AES) and Computerised Adaptive Tests (CAT) (Gardner et al., 2020). Moreover, AI, combined with human invigilators

for educational assessment, is evolving to ensure efficient supervisory methods at the examinations. The e-Assessment Association (eAA) states that AI complements live proctors and security agents (eAA, n.d). Further, they specify that AI can be used in face recognition and behaviour assessments of test candidates to ensure their true identity. However, Popenici et al. (2023) cast some doubt on employing AI for facial recognition in exam invigilation. AI-powered facial recognition algorithms developed in China seemed to function better than the software developed in the US, as US facial recognition is poor in identifying people of colour. Such racial biases of the algorithms might lead to socially discriminatory practices, negatively affecting students with darker skin colour (Popenici et al., 2023).

Besides providing highly advanced answers to questions, chatbots help assess written responses in high-stakes selection processes such as university entry and employment tests and analyse large-scale assessment-related datasets (Gardner et al., 2020). In general, the opportunities AI presents to education are vast, particularly for tutoring, assessment, and personalisation of instruction (González-Calatayud et al., 2021). Therefore, a better understanding of the educational context and the potential of technology within education is needed to get the most out of AI in education.

ChatGPT

ChatGPT stands for "Chat Generative Pre-Trained Transformer" (CTDL, 2023), and in general, it has been identified as a large language model (LLM) and a natural language processing (NLP) tool (Taecharunroj, 2023) capable of producing replies to text-based chat inputs or prompts. In other words, it can be defined as a dialogue-based AI chatbot model (Atuhaire, 2022) or a conversational AI agent capable of understanding and generating human-like written texts (Adiguzel et al., 2023). According to Hack and Knight (2023), ChatGPT is the first self-taught text generation programme that can learn and adapt to the writing style of its users. Further, "ChatGPT is a chatbot based on artificial intelligence developed by the OpenAI consortium" (Neefe & Vogelaar, 2023, p. 1) in San Francisco "that uses a technique called transformer architecture replies [that] quickly with well-formulated responses to a given prompt or context" (CTDL, 2023) by the user. It is designed to simulate human conversation and provide relevant responses to the user's input. As acknowledged, it can be used for various applications, including customer service, personal assistants, and chatbots since the launch of ChatGPT-3.5 on November 30, 2022 (Atuhaire, 2022; Hack & Knight, 2023) has invaded the internet, particularly on social media (Atuhaire, 2022). Subsequently, it was followed by an updated version, GPT-4, in March 2023 (Ifelebuegu, 2023), and it is expected to continue to evolve further with many advanced features.

As Susnjak (2022) declares, the recent release of ChatGPT has marked a significant leap in AI competencies in natural language processing, reasoning, and providing information virtually. Further, it is capable of generating the most accurate answers to difficult questions and requires the use of higher

cognitive skills. As a result, many educational institutions recognise the potential of chatbots to enhance the overall student experience (Hack & Knight, 2023). Consequently, the scholarly community has started investigating ways of integrating ChatGPT into their pedagogical approach, enhancing student involvement and educational experiences (Rasul et al., 2023).

However, it should be emphasised that ChatGPT is not a replacement for critical thinking, creativity, and human interaction. Similarly, Limna et al. (2023) viewed ChatGPT as an adjunct but not a substitute for human interaction and students' achieving their academic goals. According to Rasul et al. (2023), ChatGPT has the potential to enhance student productivity through various means, including offering valuable information and resources, guiding students in building upon their existing knowledge and experiences to create new insights, enhancing language proficiency, fostering collaboration, increasing time efficiency and effectiveness, and offering assistance and motivation. According to CTDL (2023), educators should allow students to use ChatGPT to support their learning. However, they must be warned not to rely on it mindlessly because the answers given by the AI tools are based on widely accessible material. Although they appear plausible, they may not always be accurate and factual errors can be expected. Lieberman (2023) states that some of the references it generates are outdated since it cannot produce information based on events after its most recent internet scan in 2021. Most critically, excessive dependency on these tools will hinder the development of key academic and professional skills. That applies to both students and teachers in the educational context. However, ChatGPT's ability to accomplish complex academic tasks has caused mixed feelings among educators (Baidoo-Anu & Owusu Ansah, 2023), and some think of it as a disruptive technology that poses various ethical challenges (Firat, 2023).

Although ChatGPT is the dominant chatbot, numerous other emerging chatbots and AI platforms exist. Bard is a cloud-based conversational AI platform powered by LaMBDA, which is Google's collection of conversational neural language models. Microsoft's Bing Chat, Claude, Wit.ai, Hunyuan Aid, OPT by Meta, Alexa TM by Amazon, GPT-J and GPT-NeoX by Eleuther AI and Megatron-Turing NLG by NVIDIA and Microsoft are examples of AI-powered conversational systems and chatbots (Aydin & Karaaslan, 2023; Rudolph et al., 2023b). In China, Ernie 3.0 and Ernie-VLG are among the generative AI chatbots (Rudolph et al., 2023b).

Will (2023) reveals several plus points related to ChatGPT: it can be used to plan lessons, find resources to supplement lessons, formulate summaries or reports, and grade students' work. With the aid of AI-enabled tools, teachers will have more time to dedicate to being involved in teaching or doing research (Rouhiainen, 2019). It is a powerful time saver (Will, 2023). Then again, there is a threat to the ethical contract between the teacher and the students if both use ChatGPT to formulate questions and answers. Overall, the function of ChatGPT in education appeared to be fascinating in terms of educational improvements. However, many features are of concern regarding educational assessments.

Assessing student work

Assessing and evaluating is a continuous process based on collecting information about the student's learning experience and improvement. It is the strongest evidence of what and how students learn, what they know, what they can do (Dikli, 2003), and what and how teachers teach. As Dikli (2003) and Hooda et al. (2022) elaborate, assessment feedback directs policymakers and administrators for better curriculum design, as they get a better insight into monitoring the effectiveness of existing ones. Also, timely feedback assures quality control, certification, and selection of the education system. Especially in higher education contexts, assessment and feedback are important as they improve students' grading capacity, motivation values, and academic performance, advancing learning (Dikli, 2003) and fostering learning (Hooda et al., 2022). Henceforth, assessment tasks must be fair, transparent, and authentic to recognise that students have achieved the course expectations and are eligible for appropriate recognition.

Assessment takes several forms according to the purpose of the learning environment, and the course aims and objectives often enclosed within the Standard Assessment Paradigm – SAP (Swiecki et al., 2022). Hooda et al. (2022) say it could be diagnostic, formative, summative, e-assessment, self-assessment and peer assessment. Traditionally, formative and summative assessments are practised through SAP assessing techniques like multiple-choice questions, true-false tests, essays, and short answer questions to infer student knowledge and learning (Dikli, 2003; Swiecki et al., 2022). Although traditional assessing techniques are widely used, several potential problems have been recognised: Assessments in the standard paradigm can be onerous, discrete, uniform, inauthentic, and often antiquated (Hooda et al., 2022). Despite the drawbacks of the traditional methods, some believe they are more effective, while others think alternative assessment tools are superior (Dikli, 2003). To that end, authentic, performance-based, and constructivist assessments are listed as alternative assessment tools, and online learning settings must be considered (Reeves, 2000). Simonson et al. (2000) suggest cognitive, performance, and portfolio assessments as alternative categories. As emerged from the literature, the application of AI in educational assessments can range from the designing stage to the evaluation stage of the conventional assessment process, partly or entirely, to increase the efficiency and feasibility of maintaining assessment techniques.

Methodology

Our article's critical review exclusively depends on online databases of published work related to AI and ChatGPT. The study mainly focuses on answering the specific research questions formulated at the beginning of the study. Since ChatGPT is a new phenomenon, appropriate sources discussing the topic are limited. Hence, to ensure the number and quality of articles were reasonable, the search was extended to peer-reviewed journal articles, conference papers, reports in full text, and blog posts with authorship. Regarding the year of publication, materials that appeared from 2000 were considered. For resources relevant to

ChatGPT, the period was picked from late 2022 to 2023. Text titles, abstracts, and whole texts that appeared in scholarly and multi-disciplinary databases such as Google Scholar, JSTOR, Taylor and Francis Online, Elsevier, and recognised official websites of institutions were examined to select suitable sources for the study. Moreover, both empirical and theoretical studies were followed in the selection process (since the number of studies on ChatGPT is limited).

A range of key terms and phrases were used to review the sources. They include mainly "Artificial Intelligence or AI", "ChatGPT", "Assessment and ChatGPT", "Artificial Intelligence and academic cheating", "ChatGPT and Academic Cheating and Higher education", "AI or ChatGPT and detecting cheating", and "AI or Artificial intelligence or ChatGP and reasons/factors for academic cheating". Further, the reference sections of the found sources were also searched for more relevant texts. The search yielded 378 articles, and a detailed examination of the titles, abstracts, content and duplicates was done. That resulted in the removal of 314 articles which failed to meet the criteria for inclusion. As a result, 64 research articles and sources (institutional web pages and Blog posts) were eventually included in this study.

The selected resources were studied compressively for the data and organised under the following four sections, taking the research questions as the themes to arrive at conclusions:

- The usage of AI and ChatGPT in higher education assessments
- Why do students want to cheat using artificial intelligence capabilities?
- The challenges associated with detecting ChatGPT-generated content and its impact on academic integrity
- Re-designing assessments in parallel to the advancement in technology

Table 1. Inclusion and exclusion criteria.

Type of Criterion	Criteria	Inclusion	Exclusion
Type of publication	Books		*
	Blogs	*	
	Conference papers	*	
	Dissertations		*
	Institutional web pages	*	
	Journal articles Reports	*	
Access	Online	*	
	Paper		*
Publication period	2000-2023	*	
Place of publication	World wide	*	
Type of study	Empirical studies	*	
	Theoretical studies	*	
Research methods	Quantitative	*	
	Qualitative	*	
	Mixed	*	

Results

The usage of AI and ChatGPT in higher education assessments

Due to its distinctive features, ChatGPT has garnered much attention and inspired controversy ever since its release. Many scholars foresee ChatGPT to become as ubiquitous

as Wikipedia and calculators (Hack, 2023), with its functions of language translation, content generation, and language modelling, generating summaries, articles, stories (Cotton et al., 2023), and many other types of texts. Furthermore, it increases student engagement and collaboration, provides a platform for asynchronous communication, and enables remote learning (Cotton et al., 2023). Even though the app is user-friendly, the content created using it is difficult to discriminate from text written by humans (Elkins & Chun, 2020), and it is questionable with respect to academic integrity. According to Sullivan et al. (2023), ChatGPT has raised both academic integrity concerns and the potential for enhanced learning in higher education.

One of the best examples of the application of AI in the early days is receiving fast feedback on the students' work in higher education, as reported in Mirchi et al.'s (2020) study on simulation-based training in medicine. A Virtual Operative Assistant was used in this study to give automatic feedback to students based on performance metrics. Another advancement of AI in assessment is vision-based AI, in which optical systems are used to grade students' work (Jimenez & Boser, 2021). AI's capacity to provide personalised feedback with quantitative and qualitative data has been proven by the StuDiAsE (Student Diagnosis, Assistance, Evaluation) System based on AI (Samarakou et al., 2016). Grading assignments and providing feedback to students in real time makes learning more efficient and personalised (Cotton et al., 2023). The development of intelligent software to select questions for online exams (Janpl & Piriyaawong, 2020) is another instance where AI interferes with students' assessments. Nowadays, AI-powered software is used to grade exams and students' assignments automatically. It reduces the workload on teachers while providing students with immediate feedback. Paper checkers provide accurate grading of student papers without wasting time. Collectively, the incorporation of AI with educational assessments results from intelligent tutoring, testing through games, and virtual reality to AI-built mini-tests afford a wide variety of techniques to evaluate the strengths and weaknesses of students and teachers together.

Regarding the usage of ChatGPT in students' assessments, a comprehensive analysis of ChatGPT and its possible effects on conventional assessments in higher education was conducted by Rudolph et al. (2023a). As it reports, the impact of ChatGPT on essay-type written assessments, ChatGPT's inability to understand what is being shared and the relevance or accuracy of the information are the highest concerns of academics. Being an AI language model, ChatGPT is capable of producing or summing up texts, developing assignments, supporting essay writing, providing the most suitable responses to questions, and writing computer codes (Sullivan et al., 2023; Cotton et al., 2023; Crawford et al., 2023). Further, it can assist academic writing by extracting key points (Aljanabi et al., 2023) and can carry out some other tasks that often appear in assignments. The use of interactive, game-based assessments in higher education (Cotton et al., 2023) is also based on ChatGPT, and it is termed "stealth assessments: evidence-based assessment that is woven directly and invisibly into the fabric of the learning or gaming environment" (Shute, 2015). While ChatGPT creates challenges for educators, it

negatively impacts students: it hampers students' learning ability by producing incorrect answers to prompts. It makes new learners struggle to differentiate between accurate and inaccurate information (Wood et al., 2023).

Other than providing plenty of accessible information and the opportunity to peruse new critical information to reproduce existing knowledge, ChatGPT helps to improve grammar and writing structure (Sullivan et al., 2023), especially when it comes to a learner who learns in a second language (Hong, 2023), preferably English—confirming the fact Aljanabi et al. (2023) mention that "there is no doubt that ChatGPT can be used to maintain the quality of academic work by using feedback on grammar and coherence". Although ChatGPT has advantages for idea generation, it is weaker in literature synthesis (Dowling & Lucey, 2023). Other than that, improving the students' desire for learning, establishing the basics of knowledge, and developing a deep understanding of the subject are also considered possible with ChatGPT (Hardman, 2023a; Crawford et al., 2023).

Overall, at the very basic level, students can use ChatGPT-generated responses as the starting point of the answer or use it as a guide to build up a well-structured, grammatically correct completed answer enhanced with their knowledge and ideas. Moreover, despite the students' identification of ChatGPT as a powerful text generator, it is vital to note the limitations: inability to provide accurate citations (Cooper, 2023), use technical terms appropriately, or develop evidence-based arguments can result in a superficial overview of a topic, which may compromise the overall quality of the assignment (Hack, 2023). In this background, students' skill development and the accuracy of the assessment results have become questionable and challenging in an environment where students are familiar with and using novel technological advancements such as ChatGPT. Thus, close monitoring of students' work with appropriate guidance should be there to reap the best of ChatGPT in education.

Why do students want to cheat using artificial intelligence capabilities?

ChatGPT is making a revolutionary advancement in conversational AI and has quickly established its position in academia. With many user-friendly advanced features, it provides credible service to students and academics. Although limited experimental evidence has been reported for how ChatGPT is perceived by students (Strzelecki, 2023) and why students use AI for academic cheating purposes, the most typical answer can be due to its progressive functions as a natural language processing model.

Despite the efforts taken by educational institutions to restrict plagiarism, it is still a highly concerning issue in academia. Students always get the assistance of the internet and other virtually available sources to complete their assessments, exams, and other academic work. Ease of accessing information is one of the closest reasons for students' tendency to use AI in their work. Agreeing with the same fact (King, 2023) mentions that online platforms are abundant with effortlessly reachable information, and

students can easily copy and paste from the sources. Further, the students can get the output from the AI tool quickly and are accurate to the expected level. The efficiency of AI in terms of accuracy and quickness to give the final product is another factor that makes students look for assistance. Hence, students have identified AI as a time saver and let them obtain good grades (Haun, 2022). Particularly, some students struggle to cope with their coursework, assignments, essays, and exams within a short time. Hence, inadequate preparation for the evaluation and poor time management skills also tempt students to misbehave (Dehouche, 2021).

As Crawford et al. (2023) elaborate, ChatGPT does not predict right or wrong, but using the given prompt directly generates the output, saving students time. Research evidence from Dehouche (2021) and, most recently, CTDL's (2023) findings confirm that increased pressure created on students and competition with peers are other motives for using ChatGPT or AI output in their work. Further, CTDL (2023) has found that the increasingly competitive academic environment has made students feel that they need to score high to secure their professional positions. Another possible reason to use AI-powered tools in assessments may be the difficulty level of the assessment. Recent study findings of Strzelecki (2023) suggest that students are more likely to adopt functional technologies like ChatGPT when they have high levels of "performance expectancy". Utilising ChatGPT enhances the likelihood of completing significant academic activities, speeds up the completion of assignments and projects, and boosts productivity since students see ChatGPT as beneficial to their academic endeavours.

Generally, cheating is one of the focal concerns at all levels of academia. Advancements in AI have made it easier than ever before to cheat. Students are involved in cheating purposely or by chance due to several internal and external reasons: individual, situational, and institutional factors, specifically including competition, stress, poor time and resource management, poor academic background, and to achieve good grades (Sullivan et al., 2023). On the other hand, ChatGPT's abilities as a powerful tool for producing responses and engaging in conversations also motivate students to cheat. According to the perceptions of the university community, banning ChatGPT is too hard as many students are already using it, and blocking it on the university network will prompt students to use a VPN (Sullivan et al., 2023). Hence, rather than generalising the perception that ChatGPT is a means of academic cheating, it would be more valuable if it could be viewed as a means for improving teaching and learning. Moreover, it requires further research on students' motives to use ChatGPT in their academic work.

The challenges associated with detecting ChatGPT-generated content and its impact on academic integrity

The transformation of traditional academic practices into hybrid or digital platforms raised great concern about the potential for academic misconduct. This has been heightened with the introduction of ChatGPT, as it potentially offers many applications for higher education activities (Cotton et al., 2023). As Sullivan et al. (2023) highlight, maintaining

academic integrity is a significant challenge when using ChatGPT for academic work like assessments, dissertations, and papers. As a result, academic integrity concerns are more frequently discussed than opportunities to integrate with academic work.

Plagiarism is one of the common issues attached to written texts. For example, students could use the essay-writing systems to cheat on their assignments by submitting someone else's essay (Dehouche, 2021) since AI essay-writing systems produce essays grounded on a set of limits or prompts (Cotton et al., 2023). Remarkably, that raises thoughtful questions about the authenticity of student work, especially at the stage of students' grading (Hack & Knight, 2023). CTDL (2023) verifies the claim even more and identifies ChatGPT as a motivation for plagiarism and a threat to academic integrity. On the other hand, it could ultimately devalue the earned qualification as the evaluators do not see the real skills and abilities of the student through the written work. Another challenge that comes hand in hand with ChatGPT-generated text is its ability to generate high-quality written work. Susnjak (2022) produces experimental evidence of AI capabilities, and the study results show that ChatGPT can perform high-order thinking tasks to produce text identical to human writing. This feature could be used for academic dishonesty in online examinations or assessments.

Availability and accessibility to the technological facilities are not equally distributed even among the students in the same academic group. This gives students who utilise these tools an unfair edge since they can produce higher-quality work than the rest, leading to an unfair evaluation process (Bagshaw, 2022). Similarly, students may refine the AI-generated answer several times to make it better before the submission (Cotton et al., 2023), and then again, the marker grades forged answers, which results in an inaccurate evaluation of response quality (Limna et al., 2023). As the academic staff cannot accurately judge the student's understanding of the subject, that may impact re-designing the course work.

Concerning the research community, as Bianchi (2023) states, researchers and students may submit material created using Large Language Models (LLM) as their own or may employ LLMs carelessly and generate incorrect results. As CTDL (2023) notes, ChatGPT sometimes writes believable but inaccurate or illogical responses and fixing it is not easy due to the nature of the application structure. As a consequence, deceptive knowledge sharing may occur. When the graduates work on their own in real situations as a part of their professional work, they will probably end up with a failure. That will break the public's trust towards the academic qualifications, academics, and the institution.

There is no question that submitting the raw or refined output from ChatGPT constitutes academic dishonesty, and spotting such actions is one of the main concerns in the academic community. Even though there are tools to identify plagiarism, recognising AI-generated content is still an unsolved problem (Bianchi, 2023; Hadadgar & Maunder, 2023). According to Hadadgar & Maunder (2023), detection techniques explicitly developed to recognise ChatGPT-generated content should have a high possibility of being

successful. As systems like ChatGPT grow more precise and accurate with each iteration, it may become difficult to identify created content. Experimental results of Khalil and Er (2023) to determine whether plagiarism detection tools could detect essays written using ChatGPT show that out of the 50 essays tested, 40 had a similarity score of 20% or less, demonstrating a high degree of originality. In addition to that, Chaka (2023) studied the accuracy of five AI content detective tools: GPTZero, OpenAI Text Classifier, Writer.com's AI Content Detector, Copyleaks AI Content Detector, and Giant Language Model Test Room, in recognising content generated by ChatGPT, YouChat, and Chatsonic. Chaka (2023) shows that the ability to precisely and persuasively distinguish machine-generated texts from AI-generated literature in different contexts appears to be a limitation commonly shared by all five AI content detectors. However, Copyleaks AI Content Detector was the top-performing AI content detector among the five AI content detectors used for the study.

At present, finding the best method to respond to emerging AI tools is one of the main concerns of many academic institutions. In the midst of that, Bianchi (2023) argues that the unrefined output of ChatGPT is detectable on careful inspection. Giving examples, Cotton et al. (2023) mention several approaches to detect ChatGPT-assisted written texts: examining for patterns or deviations in the language or words, looking for sources and citations, checking for uniqueness and novelty, and checking for language errors like spelling and grammar. Nevertheless, Hassoulas et al.'s (2023) study revealed that experienced markers cannot consistently differentiate between student-written scripts and text generated by natural language processing tools, such as ChatGPT. Shedding light on the recent research findings, Limna et al. (2023) suggest investigating the safe and effective adoption of chatbots, particularly ChatGPT, in education rather than banning or restricting them.

Re-designing assessments in parallel to the advancement in technology

Addressing the issues created by ChatGPT regarding assessments and evaluations is not easy due to its multifunctioning features if educators neglect to rethink their assessment strategies. Mills et al. (2023) discuss the same issue, highlighting the need to rethink assessment as the generative AI poses a grave threat to academics since it appears to co-opt the assessment methods essential to their instruction. Further, they focus on Bali's (2023) idea of moving to a culture of 'transparent assessment' and designing an assessment that truly makes students want to learn.

Considering the assessment types, Hadadgar and Maunder (2023) state that written assessments, essays, short answer questions, completion questions, and dissertations are the most affected forms of evaluation form by ChatGPT. On the other hand, MCQs, matching questions, observations, performance records, peer/self-assessments, and portfolios have been identified as entirely resistant to the impacts of ChatGPT. In contrast, Cassidy (2023) suggests physical closed-book exams where the students answer using only

pen and paper as one of the possible strategies to address the issue.

As a timely solution for the appearing issues, there lies an opportunity for academics to change the design of their assessment format. Hardmann (2023a) and Rudolph et al. (2023a, 2023b) propose overstepping the traditional methods with innovative ones, and some authors find this an opportunity to re-design assessing methods. As a key strategy, assignments can be designed in a way that students are required to reflect on their skills in critical thinking, problem-solving, communication, and collaboration (Rudolph et al., 2023a, 2023b). Increasing the chances for collaborative activities, such as engaging in group discussions, presentations, or other interactive activities) will prevent or minimise the use of ChatGPT by students (Cotton et al., 2023; Rudolph et al., 2023b). This can make it more difficult for students to use ChatGPT or other AI language models to complete their assignments and can promote critical thinking and independent learning. In addition, asking students to provide feedback or a personal elaboration about their assignment completion and a list of references may also help control the use of AI tools. However, studies have recognised three main limitations of GPT-3.5: the inability to answer semantic, factual, and ethical questions (Illingworth, 2023). Taking advantage of this, academics can prepare the questions or assignments accordingly, and students can be asked to justify their answers.

Another approach to be used is to design assessments with open-ended questions where students should develop and defend arguments on their own (Cotton et al., 2023). Furthermore, creating questions that involve contextual and real-world problems would probably limit the influence of AI tools on the answer. Hack (2023) and Rudolph et al. (2023b) point out authentic assessments as an opportunity for students to demonstrate the skills and knowledge required to work. Applying various assessment methods, like oral or live demonstrations (Susnjak, 2022; Hardman, 2023a; CTDL, 2023), and analysis of images and videos of longer texts that do not fit in a prompt (Rudolph et al., 2023a) will encourage students to produce authentic outcomes. Hack (2023) describes the range in which students use AI in their academic work and the intensity of academic dishonesty and authentic learning.

In this context, students can assemble their answers by incorporating outputs generated from multiple prompts based on the questions. Alternatively, they can submit the chatbot's output directly, with or without any modifications. Students may also employ AI to obtain and enhance an outline through their input, leading to a more authentic learning experience. This underscores the significance of human input in ensuring accuracy and comprehensiveness in academic work. Additionally, maintaining fairness in the assessment process is of paramount importance.

Rasul et al. (2023) propose an additional advanced step to authentic assessment, giving students autonomy and agency to answer the questions in their own way rather than forcing them to write the same essay or respond to the same question. In doing so, assessments are anticipated

to become more attractive, comprehensive, and, in the end, authentic. However, it raises another issue about the assessing task's standards and uniformity. As another alternative, the authors suggest providing ChatGPT's responses to the question together with some marking guidelines. Then students can be asked to comment about and/or reason out the grade the automated response deserves. Continuing the discussion, Rasul et al. (2023) recommend ChatGPT-generated scenario-based tasks that involve analysing and solving problems they may encounter in their future careers. Additionally, Ifelebuegu's (2023) study emphasises the importance of re-designing tests and assessments to place a larger priority on higher-order skills. They favour authentic assessment methods such as open-ended activities, project-based assignments, collaborative assessments, and portfolio-based evaluations since they make it difficult for AI chatbots to replicate.

Hence, it is noteworthy that giving authentic assessments provides students with much space to use ChatGPT responsibly, and it is the best way to combat the threats to academic integrity. Also, it safeguards the quality of academic programmes while providing ample opportunities for the ethical and responsible use of AI.

Discussion and conclusion

As a whole, the study results encourage the integration of AI in education. They highlight the requirement for the collaborative effort of education providers and policymakers to go for innovative and diplomatic strategies to use AI-based tools in academic work. Since AI has been identified as an education enhancer and a valuable educational tool (Limna et al., 2023) by educators, policymakers and other stakeholders in the education context, it should be invited and encouraged. According to the outcomes of this study, ChatGPT can give more precise and accurate answers to questions, write abstracts, summarise text, and perform many functions related to academia. In contrast, Wood et al. (2023) argue that some question types are less likely to be correctly answered by ChatGPT, and thus, focusing on such question types could reduce the risk of cheating with ChatGPT.

Furthermore, many researchers emphasise the pedagogical integration of ChatGPT. Designing curricular and pedagogical methods that better use the advanced features of ChatGPT is one of their major concerns. In a way, ChatGPT is a time saver since it provides solutions to more complicated issues within a few seconds, which requires the involvement of higher-order intellectual skills. Moreover, due to the user-friendly features of ChatGPT, it is widely used in academic work, including the assessment process. Henceforth, it has become a thought-provoking problem regarding the students' authentic academic performances, as there is room for academic malpractice using ChatGPT. Simultaneously, it alarms about quality assurance of the qualification, employability of the graduates, and the skills required to succeed in an AI-dominated world. ChatGPT's capabilities, limitations, and impact on students' academic performances are among the prominently discussed themes related to ChatGPT. Accordingly, continuous and

collaborative discussion among educational policymakers and stakeholders is required to develop policies and guidelines to ensure the ethical use of ChatGPT.

Although ChatGPT impacts academics and students equally, the current literature primarily focuses on academic teachers' and scientists' views on ChatGPT and its future, and students' perceptions as crucial stakeholders have not been clearly highlighted (Strzelecki, 2023). As Lieberman (2023) points out, some educators already consider integrating the app into education, while others are worried about how it may affect their pupils' drive to study. Bagshaw (2022) also stands on the same ground and states that some academics are alarmed by the function of ChatGPT. Conversely, the author refutes the claim by pointing out that the other side may benefit from its strength. As emerged in the previous discussions, academics are aided with generating lesson plans, test questions, quizzes, and rubrics to grade students with ChatGPT. However, clearly, it is an opportunity to promote graduate skills. On the side of the students, ChatGPT can be identified as a conversational and interactive tool in which students can readily find answers to their assignment questions and get the outline for essays. Hence, it is the responsibility and the duty of educational institutions and stakeholders to prepare students for the tech-driven future and let them experience the benefits of technological advancements. Further, more research on students' understanding and experiences of ChatGPT in their higher education, the benefits they have and most interestingly, why they use it and when it is needed.

Making students familiar with novel technologies is extremely important, but still, they should be aware of the ethics of using them. This is further supported by Hack (2023) and highlights the crucial need for students to learn how to engage with AI to get the advantage it brings while knowing its limitations and threats. Moreover, Cotton et al. (2023) suggest that conveying guidelines on using AI tools for academic purposes and informing about proper citation and acknowledgement of ChatGPT-generated text is necessary. In addition, getting a written declaration mentioning that they are responsible for the consequences of academic misbehaviour is also a reasonable measure. Despite applying sophisticated detective methods, teachers can react to unethical ChatGPT usage by punishing students and giving in-class examinations.

Additionally, re-designing assessments and evaluation methods in such a way as to limit the usage of AI and make room for employing students' intrinsic skills in the assessment completion process is critical. In that sense, designing higher-order cognitive assessments focusing on analysis, synthesis, evaluation, and creation effectively counteract ChatGPT (Ifelebuegu, 2023). Bianchi (2023) proposes to use tools to detect AI-generated content introduced by OpenAI: AI Text Classifier, GPT-2 Output Detector, and a classifier based on RoBERTa. Simply educating students about plagiarism and its consequences at any stage of coursework is a measurable act to minimise the unethical use of ChatGPT. Accordingly, as revealed through the study, the detection and prevention of unethical use of ChatGPT and the encouragement of ethical use of AI are other dimensions on which academics and policymakers focus. However, allowing students to utilise

ChatGPT and other AI tools per a pre-established set of guidelines and within specified parameters will be far more appropriate since it will provide students with the practice of using cutting-edge educational technologies ethically.

AI is still being developed and appears to act similarly to humans in many fields. However, combining AI with human capabilities such as creativity, cognitive skills, and social-emotional skills would bring the best outcome. Hence, despite ChatGPT's disadvantages, the pros must be strengthened while the cons are addressed strategically. Updating academic integrity policies, providing training on AI tools such as ChatGPT and academic integrity and encouraging research on AI tools' effect on higher education are equally important (Rudolph et al., 2023b). Scholars can research unexplored elements such as specific pedagogical approaches to maximise the benefits of ChatGPT, strategies addressing its limitations, or the impact of ChatGPT on different subject areas, student assessments and higher education productivity.

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