

A scoping review of challenges and opportunities of assessments in higher education

Flip Schutte

Abstract

The post-Covid continuation of online classes and assessments in higher education at many institutions has necessitated re-evaluating assessment practices. This research article presents a scoping literature review on the challenges and innovative opportunities regarding assessments in higher education. The contextual factors of load-shedding, unavailability of Wi-Fi, the requirement for cheat-proof online assessment, and questions with ungoogleable answers or answers that ChatGPT could not provide underlined the importance of this topic. Thirty articles were analysed using the qualitative software tool, Atlas.ti. According to the literature, the main challenge is cheating with online assessments, and the best solution provided is oral presentations students' work. This complex issue needs further research on combining contextual challenges, the credibility of assessments and the enhancement of 4IR workplace skills in one assessment model to support assessments in higher education.

Keywords: *assessments, online assessments, higher education, innovation in assessments, assessment challenges*

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1. Introduction

The overall success within Higher Education Institutions (HEIs) is based upon continual and consistent student throughput rates and completion of qualifications. These factors are the stabilising and underlying visible guiding principles of best practice regarding student success in higher education. HEIs are currently at a crucial crossroads in their learning and teaching strategies, where they must consider the future goalposts. Furthermore, HEIs must determine what quality entails and what will be sustainable, replicable, and achievable. The key focus will be quality assessments (Heil & Ifenthaler, 2023).

Student success has recently come under the spotlight because of the potential causal link between emergency interventions implemented during COVID-19 and the marked improvements in student throughput rates during the 2020/2021 academic cycles. The Covid-19 pandemic disrupted higher education in many ways. Teaching, learning, group, practical work, and assessments moved online and took on new modes (Adama et al., 2023). However, the COVID-19 pandemic was not the first nor the only trigger to move assessments online. It also happened during the Rhodes Must Fall and #FeesMustFall, the student-led protest movement that began in 2015 in South Africa. The #FeesMustFall protest officially ended only a year later, in October 2016 (Luescher et al., 2016). Many institutions moved online during these periods to ensure ongoing student learning and assessments. Some campuses were also disrupted in 2020 during the #BlacklivesMatter protests, which forced students off campus and online. The assessments moved online were either multiple choice questions or traditional sit-down assessments that just moved online. Questions about the online education sustainability, efficacy, and integrity and its impact on student success remain unanswered and underexplored (Susnjak, 2022). Hence, there is a need for further reflection and research as HEIs navigate their way out of the pandemic and into a post-Covid world, which seems to be a hybrid environment at this stage.

The way HEIs implemented assessments already started to show fractures pre-COVID-19 (Alzubi et al., 2022). Many higher education institutions rely on traditional assessment methods, such as examinations and standardised tests. However, these methods may not effectively measure a student's understanding, critical thinking skills, or ability to apply knowledge in real-world situations. This limitation has led to a growing recognition that

assessments need to evolve to reflect better the skills and competencies required in the modern workforce (Acharya, 2022). Some assessments prioritise memorisation over understanding and application of concepts. This approach often fails to capture students' ability to think critically, solve problems, and analyse information meaningfully (Akhter, 2020). Higher education institutions serve diverse students with varying learning styles, backgrounds, and abilities; traditional assessments may not cater to all student's individual needs and strengths, leading to inequities and a lack of inclusivity in the assessment process (Jones et al., 2020).

The rapid advancement of technology has highlighted the need for assessments to keep pace. Traditional pen-and-paper examinations are seen as outdated, and there is a growing demand for more innovative and technology-driven assessment methods that could better prepare students for the digital age. The increasing interconnectedness of the world and the rise of interdisciplinary fields require a shift in assessment strategies (Coates, 2023). Many traditional assessments were designed within the confines of specific disciplines and struggled to evaluate the interdisciplinary skills and knowledge that are increasingly valued in the workforce. There is also a growing emphasis on outcomes-based education, where assessments are aligned with specific learning objectives and goals. Traditional assessments are sometimes criticised for not effectively measuring the intended learning outcomes, leading to a call for more authentic and performance-based assessments (Jones et al., 2020). Ongoing research in educational psychology and pedagogy sheds light on more effective ways to assess student learning. Therefore, assessments need to be rethought.

Apart from continuous research in higher education assessments is needed, this article focuses on the fact that the move to emergency remote teaching during the COVID-19 pandemic revealed that assessments could be done differently. This disruption acted as stimuli for the reconceptualisation of current practices and the conduct of higher education assessments. Although many assessments reflect students' learning curves, written examinations are the most common approach higher education institutions in South Africa use (Omar et al., 2012). The emphasis on assessment has become more important because modern society demands high-quality learning. However, according to Mawa et al. (2019), little is known about the assessment of learning or assessment practices in higher education.

In the digital world, students are connected to the internet 24/7, type on keypads, have permanent access to all information, and struggle with load-shedding and affordable data.

However, in general, when it comes to assessments, they are forced back to a world of no access to information, writing with a pen on paper, and memorising facts instead of applying them to new situations while googling the information they need. Because of this old-school assessment paradigm, students must memorise and remember information and get mostly evaluated on what and how well they can remember. This type of learning is known as rote learning (Oxford Learning, 2017), and it does not always allow for a deeper understanding of a subject, connections between new and previous knowledge, and social skills. This contrasts with meaningful learning, which involves understanding how all the pieces of an entire concept fit together by encouraging students to engage in the learning process fully.

Assessment methods did not develop at the same pace as the world around the examination centre. Examinations happen in a world and context that is not coordinated and in pace with the world in which the student lives. These worlds must merge to not only accommodate the availability and absence of electricity, data and the movement towards asynchronous learning but also to turn assessments into practical knowledge about the subject, where the student can gain experience and learn valuable new skills during the assessment (Adepoju & Aigbavboa, 2021), instead of just being an exercise in parroting the textbook and memorising class notes.

To address these burning issues, this paper presents a scoping literature review on the challenges and opportunities for innovative assessments in higher educational institutions post-COVID. This study's purpose is to, after identifying the challenges of assessments, reimagine future possibilities for assessment within learning and teaching in higher education in an ever-evolving and disruptive context. In a follow-up article, different possibilities and options will eventually be used to reconceptualise a model for innovative assessment practices. These assessment practices must be adaptable to a VUCA (Volatility, Uncertainty, Complexity and Ambiguity), digitalised world. This paper thus aims to answer the research question: What are, according to existing literature, the challenges and opportunities for innovative assessments in higher education institutions?

2. Research Methodology

The Scoping Review Methodological Framework was developed by Arksey and O'Malley (2005) and consists of five steps, namely: Identifying the appropriate research

question; Identifying relevant and related studies; Selecting studies from relevant databases; Charting the data to predetermined codes; and collecting, summarising and reporting the results. To report the findings, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) are used (Tricco et al., 2018). According to this guideline, the researcher develops a scoping review protocol. This protocol defines the criteria for identifying and selecting literature and formulating the search terms, screening process, and codes for the data extraction.

2.1. Review Protocol

The review protocol defines the eligibility criteria used for identifying and selecting relevant literature and the search terms, screening process, and codes for the data extraction (Van Schalkwyk et al., 2022).

Table 1

Scope-relevant search terms

Scope	Search terms
Challenges and problems experienced with online assessments and with assessments in general in higher education	Challenges with online assessments; barriers experienced during online assessments; problems experienced with online assessments; assessment problems
Solutions, suggestions and innovative ways for future (online) assessments in higher education	Innovative ways of assessments; recommendations for the future of assessments; improve quality assessments; improve credibility of assessments

Table 2

Inclusion and exclusion criteria

Inclusion	Exclusion
English language	Not in English
Peer reviewed	No link with technology
Based on the original data	Opinions, commentary, columns
Addressing assessments, online assessments, barriers/challenges/problems experienced with assessments/online assessments	Not peer-reviewed Not downloadable articles Chapters in books
Recommendations/suggestions for innovative forms of assessments, improve quality of assessments, improve credibility of assessments	Not related to higher education

2.2 Search strategy and database

A literature search was done during June 2023 on the Ebsco, Emerald and Google Scholar databases to identify relevant literature. Only peer-reviewed and open-access articles were selected. An initial search on “online assessments in higher education” produced 16 100 results. Search strings and search phrases for each database were reformulated to limit the irrelevant hits and improve the accuracy of the searches. The next search delivered 6749 results. Duplications between the databases and articles that focussed more on online pedagogies than assessments were eliminated.

Figure 1

Selecting process

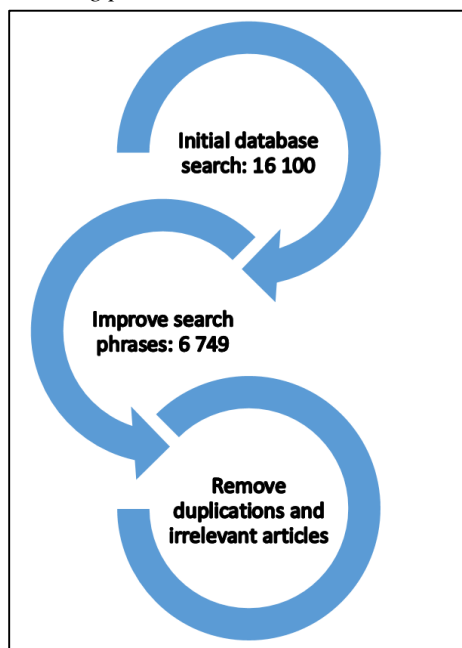
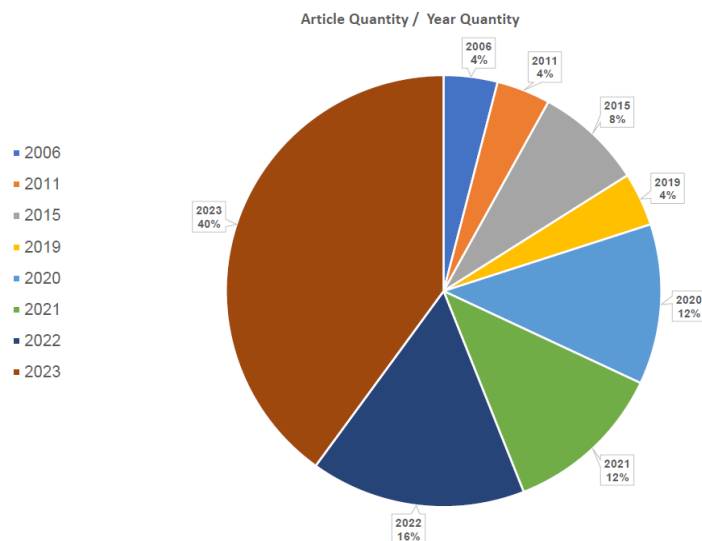


Figure 2

Year of publication

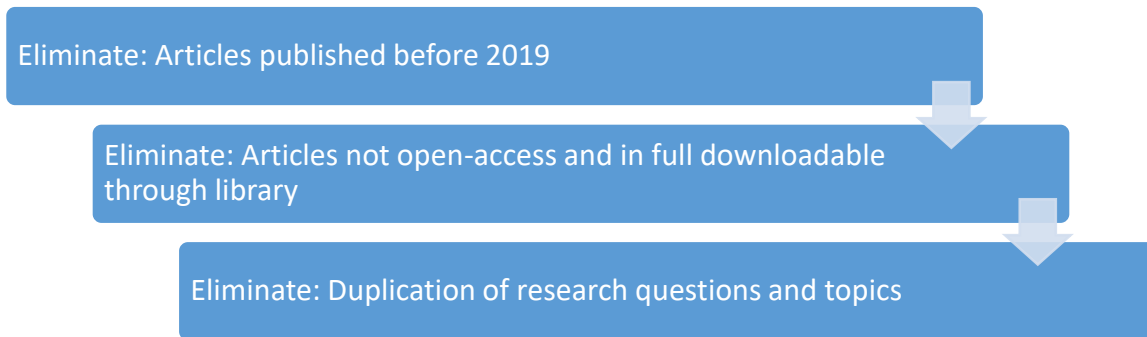


After the next search, figure 2, it was obvious that most literature on online assessments was published during and after the COVID-19 pandemic. To further narrow the search, articles on students' or lecturers' in-depth experiences of online teaching and assessments during COVID-19 were eliminated because this study focuses more on challenges and the way

forward than experiences on online assessments. As indicated in figure 1, most publications were published during and after the Covid pandemic, therefore, articles published before 2019 were excluded. Afterwards, articles that were not open-access and in full, and not downloadable through the researcher's institutional library access, were eliminated.

Figure 3

Elimination process



After scanning through article titles and abstracts, those covering the same topic and coming to the same conclusions were eliminated because many Covid-assessment articles duplicated research. The only differentiating factor is that the research was done in different institutions with a different set of participants. However, literature reviews and findings are very similar on challenges experienced by students. This resulted to a final 30 papers selected for analysis and synthesis.

3. Results

The selected articles were analysed for data extraction using the qualitative data analysis software Atlas.ti. Relevant themes for the two main concepts (challenges and opportunities) were identified. Table 3 indicates the 30 articles used for scoping review.

Table 3

Selected articles for the scoping review

	Author	Article title	Challenges	Opportunities
1	Adama, Graf, Adusei-Asante & Afrifa-Yamoah, 2023	Covid-19 and alternative assessments in higher education: implications for academic integrity among nursing and social science students	Cheating; misconduct; Creating WhatsApp groups with other students during assessments	Alternative assessments; Oral assessments/ Viva via online platforms; Presentations; Take-home open book assessments; Assignments; Application on real-world scenarios; Problem-based assessments; Project-based assessments

	Author	Article title	Challenges	Opportunities
2	Al-Bargi, 2022	Exploring online writing assessments amid Covid-19: Challenges and opportunities from teachers' perspectives	Assessment integrity; cheating	
3	Alzubi, Al-Mwzanaiji & Nazim, 2022	Online and offline assessment methods in higher education: A revisit of EFL teachers' perceptions and practices	Cheating; assessment integrity	Oral assessments
4	An, Adanu, Tutela, Berg & Bartle, 2021	Supporting University Faculty with online assessments during the COVID-19 Pandemic: Challenges and opportunities	Lecturers' skills; Available technology; Assessment integrity; Cheating	
5	Baidoo-Anu & Owusu Ansah, 2023	Education in the Era of Generative Artificial Intelligence (AI): Understanding the Potential Benefits of ChatGPT	Lack of interaction	Incorporate ChatGPT in assessments; AI can mark assessments
6	Bozkurt, Xiao, Lambert & Pazurek, 2023	Speculative futures of ChatGPT and Generative Artificial Intelligence (AI): A collective reflection from the educational landscape	Cheating	Oral presentations; promote critical thinking
7	Cotton, Cotton & Shipway, 2023	Chatting and cheating: Ensuring academic integrity in the era of ChatGPT	Academic honesty; Plagiarism; cheating and dishonesty	Technology to detect and prevent cheating; AI present asynchronous opportunities
8	Dawson, 2021	Defending assessment security in a digital world. Preventing e-cheating and supporting academic integrity in higher education	Cheating; academic integrity	Oral online assessments
9	Devisakti & Muftahu, 2022	Does online assessments support of students in higher education? The moderating role of IT experience	Technological skills	Students prefer online assessments

	Author	Article title	Challenges	Opportunities
10	Dos Reis, Swanepoel, Yu & Anciano, 2022	Exploring the alignment of first-year summative assessments with Bloom's Taxonomy: a longitudinal study	No policy to guide HEI on taxonomies for NQF levels; Technical skills	Students prefer online
11	Gamage, Ayres, Behrend & Smith, 2019	Optimizing Moodle quizzes for online assessments		Online quizzes
12	Halaweh, 2023	ChatGPT in education: Strategies for responsible implementation	Cheating	Integrate ChatGPT in assessment; Proactive approach; Presentations/ Viva/ defending your work
13	Heil & Ifenthaler, 2023	Online assessments in higher education: A systematic review	Internet networks; Reliable connectivity; Internet access	Peer-assessments; gamification; self-assessments; research-based questions; E-Portfolios; journaling
14	Holden, Norris & Kuhlmeier, 2021	Academic integrity in online assessment: A research review	Dishonesty and cheating	Multiple-choice questions; Take-home open-book essays; cheating detection systems
15	Huber, Harris, Wright, White, Radulescu, Zeivots, Cram, & Brodzeli, 2023	Towards a framework for designing and evaluating online assessments in business education	Academic integrity	Open-book online assessments
16	Hussin, Idris & Misnan, 2020	How does it challenge in higher education? A case study	Communication barriers; Technological skills	
17	Ifenthaler, Schumacher & Kuzilek, 2021	Investigating students' use of self-assessments in higher education using learning analytics		Self-assessment; peer-assessment; journaling
18	Kakepoto, Arshad, Halepoto & Arslan, 2021	Lessons learned: Online examination and assessment practices during pandemic	Technical skills such as uploading of scripts; loadshedding; Slow internet speed	New policies
19	Kakepoto, Memon, Halepoto, Talpur & Jalbani, 2021	Exploring E-learning barriers of university students during Covid 19 pandemic	Poor computer literacy; loadshedding; slow internet speed; expensive internet packages; lack of interaction between student and lecturer	

	Author	Article title	Challenges	Opportunities
20	Kasneci, Sessler, Kücheman, Bannert & Dementieva, 2023	ChatGPT for good? On opportunities and challenges of large language models for education		Use AI and ChatGPT as part of assessment tools; AI for automated assessments; AI to evaluate peer assessments
21	Kembo, 2020	How effectively are university students tested? A case study	Skills to set assessments	Link assessments and learning outcomes
22	Lim, Gunasekara, Pallant, Pallant & Pechenkina, 2023	Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators	Cheating; Plagiarism	
23	Mawa, Haque & Ali, 2019	Level of learning assessed through written examinations in social science courses in tertiary education: A study from Bangladesh	Current system only assesses remember and understand	Assessments must cover apply/ analyse/ evaluate/ create
24	Murray & Williamson, 2023	To embrace, or not to embrace: ChatGPT is the question	Cheating	Assignments; presentations; vivas; multiple choice
25	Ontong, & Bruwer, 2020	The use of past assessments as a deductive learning tool? Perceptions of students at a South African University	Repetitive questions in assessments	Promote critical thinking
26	Pavlik, 2023	Collaborating with ChatGPT: Considering the implications of generative artificial intelligence for journalism and media education	Limited range and depth of AI generated text; Inhibit creativity and critical thinking	Collaboration with AI
27	Perwitasari, Astuti & Atmojo, 2021	Online learning and assessment: challenges and opportunities during pandemic COVID-19	Unstable internet network; Expensive data; Technological constraints	
28	Rudolph, Tan & Tan, 2023	ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?	ChatGPT do assignments and generate text on behalf of students; cheating; It threatens the essay as an assignment method	ChatGPT brings an end to traditional exams; Use it as a language assistant. AI powered assessment applications to detect cheating; start using assessment not for, but as learning; Presentations are cheat proof. Application/ critical thinking assignments rather than formulaic.

Author	Article title	Challenges	Opportunities
29 Susnjak, 2022	ChatGPT: The end of online exam integrity?	Misconduct in online examinations; cheating with AI tools	Oral exams; Invigilated exams; Technology to detect AI
30 Xiao, Qiu & Cheng, 2019	Challenges and opportunities for effective assessments within a quality assurance framework for MOOCs		Peer-assessment; self-assessment; gamification; asynchronous possibilities

3.1 Challenges with online assessments

Figures 4 and 5 display the challenges about online assessments found in the literature.

Figure 4

Challenges with online assessments

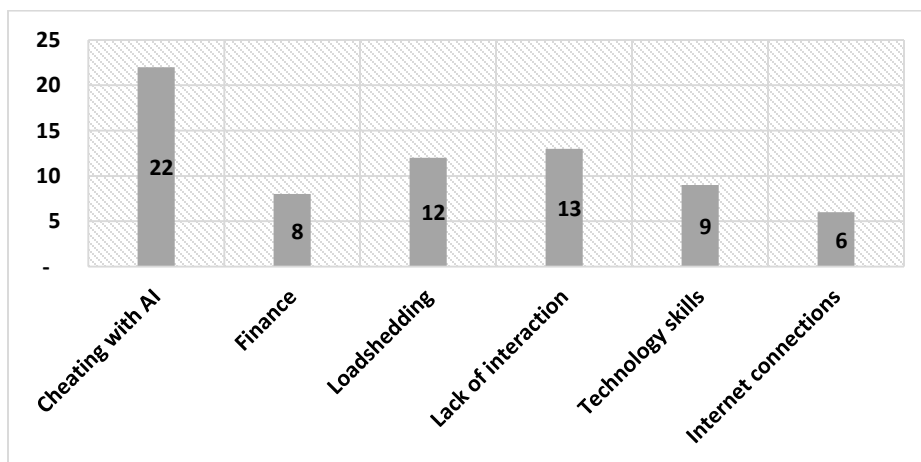


Figure 5

Word cloud of themes related to challenges with online assessments



Integrating online assessment methods in higher education has emerged as a promising approach to adapt to the evolving digital landscape. With the proliferation of virtual learning environments, educators are increasingly exploring online assessment practices to enhance student engagement, streamline assessment processes, and accommodate diverse learning styles. However, this shift has not been without its challenges. This section delves into the complexities surrounding assessment in higher education, aiming to identify educators, institutions, and students' challenges. Literature related to the identified codes were synergised, summarised and presented in the foregoing discussions.

Apart from the quality of assessments, which is not the focus of this paper, Kakepoto et al. (2021), *inter alia*, revealed that poor computer literacy, electricity load-shedding, slow internet speed, expensive internet packages, and lack of interaction between students and lecturer are the challenges towards online assessments. On the other hand, students considered online assessments as helpful and positive. Thus, it must be part of the future of student success and quality assessments.

Cheating in online assessments is a huge concern, especially for sit-down online assessment sessions, because students have their textbooks and notes (Baidoo-Anu et al., 2023; Huber et al., 2023). They also create WhatsApp groups where they share answers, and more students also use AI, such as ChatGPT, to answer assessment questions on their behalf (Cotton et al., 2023; Lim et al., 2023). This raises concerns regarding academic honesty, integrity and plagiarism (Kasneji et al., 2023). On the other hand, using artificial intelligence, webcams and other technology to monitor students during examinations raise questions about privacy and ethics (Dawson, 2021).

Another huge challenge, especially in South Africa, is to keep the electricity on. This is a fundamental problem, and it affects online assessment of students. Kakepoto et al. (2021) confirmed that it is not only a South African problem. Most developing countries struggle with the same challenge. Pakistan, for example, sometimes has up to 12 hours of electricity load shedding per day. This is a key problem towards effective online learning for students, and it has huge implications for online examinations. Some online examination technologies are resistant to a loss of internet connectivity. But the problem is that, all online examinations rely on electricity. How to program a power outage into the examination and tools to terminate or pause the examination still need some thinking. How will it recommence once the power is

back on? Can the load-shedding time be bracketed so it does not count as assessment time? These and other related issues must be further investigated (Dawson, 2021).

Connectivity has changed the spaces and times where learning and assessments occur (Bozkurt, 2023). The learning and assessment context has been and is still rapidly changing. Approaches that have been working effectively for decades are challenged, and it seems as if they are no longer appropriate to meet the expectations and needs of the 4IR. To be constantly connected is a way of life, and it has serious implications for learning and assessment (Holden et al., 2021). Both can happen anywhere and anytime and can be scheduled around one's lifestyle, habits or preferences. The current buzzword is "personalisation". Not every person has the same approach to learning, and technology supports this situation (Huber et al., 2023).

A further challenge is the lecturers' and students' technological competence (Halaweh, 2023). It is assumed that they know how to use technology effectively in class and during assessments, but many are either struggling with or avoiding the use of technology (Joshi, 2017). According to Do Reis et al. (2022), the assessment problem, in the case of educators, relates to the curriculum problem. Some curricula remained unchanged for a decade or more, and the academic staff who ought to lead curriculum innovation often do not have the technological skills and tools required in the current situation. These challenges must either be addressed or accommodated in one way or another to facilitate the online assessment process for the future within higher education institutions.

3.2 Innovative opportunities with assessments

Figure 6
Opportunities with future modes of assessment

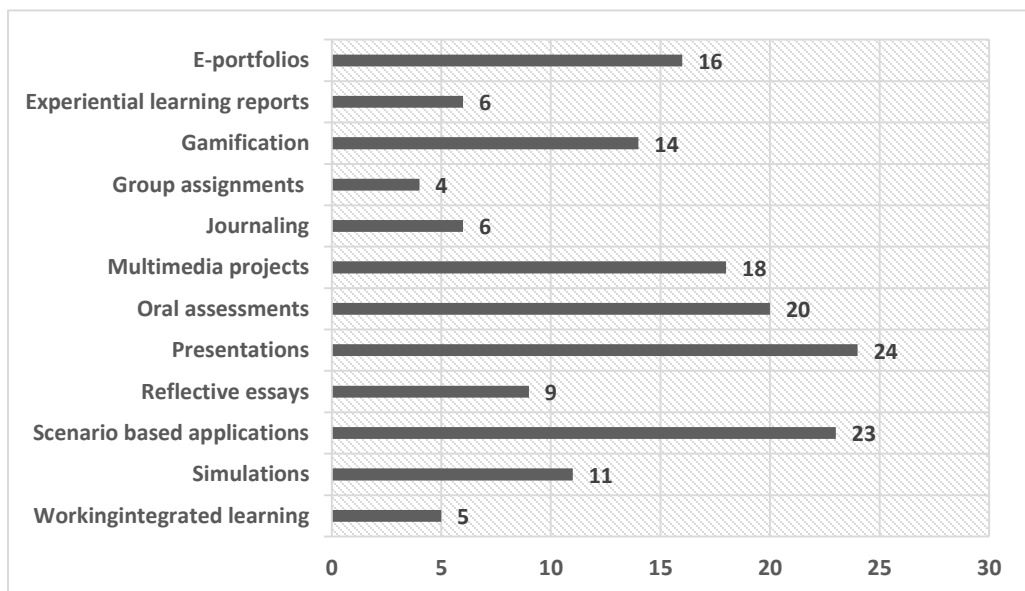


Figure 7

Word cloud of assessment opportunities for an online assessment environment



Assessment through written examination is a traditional method, universally practised in most educational institutions. It is a system in which questions are created following the subject content. This is done to evaluate if learning took place and if students are competent when measured against the learning outcomes of a subject. But how effectively this testing is done is an issue that needs to be addressed (Kembo, 2020). The following is a synergised and summarised review of the literature analysed for this study.

Despite the importance and regularity of testing, many institutions of higher learning do not train their lecturers to assess students effectively. According to the assessments of examination papers done by Dos Reis et al. (2022), most papers do not align with the appropriate National Qualifications Framework level, questions are not crafted in suitable, well-formulated language, and in many cases, the same examination questions are repeated over several years. Kembo (2020) confirmed that, in some cases, academics expect students to provide word-for-word replications of lecture notes. If this is how students are trained to respond, they will not be able to think critically and innovatively in a 4IR world. The assessment paper should stretch and challenge students and not merely test for memory.

It is taken for granted that if an educator holds a PhD or master's degree, they are qualified to create examination papers constructively (Kembo, 2020). However, a study by Momsen et al. (2019) showed that over 60% of the questions asked stayed at lower levels of cognition and did not test students' abilities to re-organise information, use it in different ways, synthesise it or even apply it to novel situations. The absence of these higher-order questions indicates that examinations do not adequately show who the students are with the best skills and competencies. It indicates students who have a better memory.

The debate on how assessment at the higher education level must be done is not a new post-Covid issue (Mawa et al., 2019). At many institutions, examination papers assess the student's competency against the learning outcomes. The prescribed textbooks and study guides are the main materials that students use to prepare for examinations. The textbook or outcomes do not change every year. Because of this, a practice has developed where students utilise past assessments as a deductive tool to predict future areas that will be assessed, as well as certain characteristics, such as the difficulty level of question papers (Ontong & Bruwer, 2020). According to Ontong and Bruwer (2020), when past papers are used, they inhibit the development of critical thinking skills. This repetitive nature of items being assessed may result in students who can pass assessments but cannot demonstrate critical thinking skills as required by module outcomes. For Mawa et al. (2019), the assessment of learning is an ongoing process as it is being conducted continually in various forms. These forms and methods may include tests and examinations and a wide variety of products and demonstrations of learning, such as portfolios, exhibitions, performances, presentations, simulations, multimedia projects, and a variety of other written, oral, and visual methods. However, written assessments seem to be the dominant one.

Critical thinking has become one of the sought-after skills in the 4IR. The use of only traditionally written assessments, or the use of past assessments in a repetitive manner in the compilation of new assessments, as well as a focus on past papers during lectures and revision, lead to a comfortable space for students because they know what questions to expect and what answers to prepare, as opposed to challenging papers that will stimulate critical thinking and the analysis of new scenarios. When this assessment style is followed, higher education institutions are creating students who merely act as regurgitators of academic content through familiarity with the content and patterns of previous academic years' assessments rather than

producing critical thinkers and problem-solvers through test-enhanced learning and applying an appropriate learning approach (Ontong & Bruwer, 2020).

According to Mawa et al. (2019), critics argue that written examinations are limited because they only test students' verbal ability and, in a sense, their ability to memorise and remember. This method of assessing is usually a one-time measure based on the achievement made by a student on a particular day. On a single correct answer per specific question, this one intervention adds up to 50 – 70% of the total year mark, omitting the student's demonstration of overall knowledge and thought processes. The practice of formative and summative assessments needs some rethinking. Therefore, the enquiry into other assessment methods also identifies the need to measure what students can do with what they know rather than to find out what they know. Other authentic forms of assessment can encourage students to use higher-order cognitive skills and to use their knowledge creatively, encourage them to analyse, synthesise and evaluate (which are the highest orders in Bloom's 1959 cognitive taxonomy) and prepare them better for a life in a demanding digitalised world where problem-solving, critical thinking and decision-making activities are in high demand.

A new way of thinking about assessment is necessary. A burning question is the introduction of peer, group, and self-assessment in designing assessment processes (AdvanceHE, 2019). This is important to develop students' capacity to make judgements about their own and others' work. Being able to do this realistically and ethically is likely important for all graduates in their future professions and workplaces. But to assess and evaluate, one needs criteria against which it can be done. Sometimes, students design their own assessment criteria (Xiao et al., 2019). This, as well as the process of evaluating peers or their work, contributes to a deepening understanding of how work is assessed and what is valued in a specific discipline.

Online examinations are still trying to find an identity of their own (Heil & Ifenthaler, 2023), after moving online during the COVID-19 pandemic's remote emergency teaching phase. These examinations were not initially designed as online examinations but as sit-down examinations that were quickly moved online (Schutte, 2021). Since the first Covid-examinations, institutions have experimented with different forms of online examinations. Currently, online assessments at many institutions are more suitable for multiple-choice questions and questions with short answers or questions that can be machine-marked (Gamage

et al., 2019). Questions are given inversely to avoid cheating, and each student might receive a separate set of randomly selected questions. Thus, some students may have more difficult questions; therefore, a fairness issue can arise. Technology to prevent cheating has also been developed and used, such as web lock software, webcams, fingerprint readers and biometric machines (Kakepoto, Arshad et al., 2021). Researchers such as Dawson (2021) are focused on finding solutions for e-cheating.

Technology is constantly creating new opportunities for learners to have more control over how and where their learning occurs; this includes some assessments. The e-learning environment incorporates collaboration, interaction, and engagement. It makes various possibilities, including assessment by simulations, journaling, reflective essays and gamifications (Ifenthaler et al., 2023). Simulations replicate real-world scenarios, allowing students to apply theoretical knowledge to practical situations and fostering critical thinking and problem-solving skills. On the other hand, gamifications infuse elements of competition, rewards, and immediate feedback, which boosts motivation and encourages active participation. This approach to assessment caters to various learning styles, promoting higher levels of engagement and knowledge retention (Latifah & Fauziah, 2022). Similarly, journaling and self-reflective essays provide a platform for students to express themselves freely, which can be particularly beneficial for those who may not excel in traditional assessment formats like exams or quizzes (Bennion et al., 2019). It fosters self-awareness, and educators can gain valuable insights into individual student progress, learning processes, and emotional well-being, allowing for more personalised feedback and support.

Technology has not stagnated during COVID-19; it has grown, and the 5th Industrial Revolution is now a reality. The future of technology post-Covid will grow, and artificial intelligence and chatbots are anticipated to transform communication. Logically, this concept follows that it will also change the world of digital literacy (Rudolph et al., 2023). Digital literacy and online learning will be catalysts for ensuring that future generations of learners are employable and ready to work in a world that includes new and innovative technology methods. Technology will also influence students' behaviours in the future (Rudolph et al., 2023). Therefore, higher education institutions must address how they look at learning and particularly assess learners in the future. One positive concept of online learning during

COVID-19 was that learners, particularly adult learners, could adapt to what became known as the new normal (Al-Bargi, 2022).

Higher education needs to remain relevant, authentic and adaptable. A key component will be changing the overall model of assessment that allows learners to embrace technology and a method that allows learning to be transferable and relatable and, most importantly, that allows learners to be employable and able to demonstrate that they have truly a high competency in their area of study. Practical and innovative assessment strategies based on models that include flexibility and life-long learning components will be how future learners thrive in a highly competitive world (Holden et al., 2021).

4. Discussion

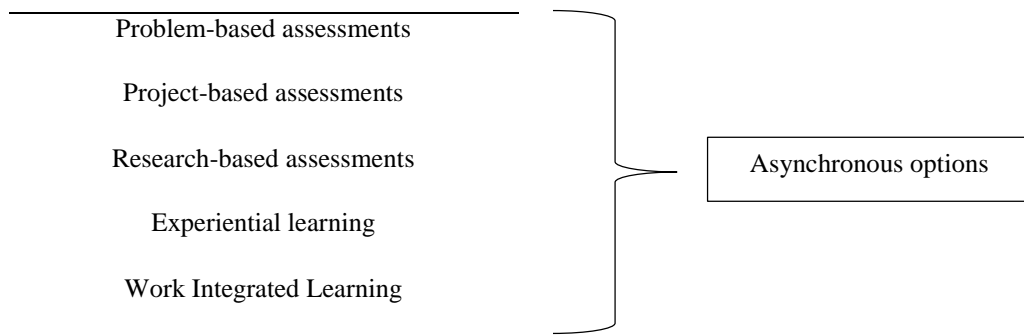
From the findings, it was evident that higher education needs a way of assessing students that are load-shedding and unavailability of Wi-Fi, AI, and cheat proof, but that will address learning outcomes and employability skills, and that can be done asynchronously to accommodate either load-shedding or the lifestyle of the student. Thus, the challenges must be paired with innovative opportunities to produce assessment solutions for the future.

One of the biggest challenges mentioned by the literature is the problem of cheating during online assessments. Students are either searching in their textbooks or online for answers. ChatGPT, other AI technology and WhatsApp groups were also mentioned as cheating tools. From all the different suggestions made in the literature, this study concluded that problem-based and project-based assessments might be the most credible because they minimise the chances of cheating or copying and pasting an answer from the internet. Experiential learning, work-integrated learning, research assignments and the application of skills can also contribute to better learning during assessments. According to the literature, presentations or oral assessments are the best option to avoid cheating. Table 4 indicates the different options for assessment available according to the literature.

To address challenges such as the problem of load-shedding and Wi-Fi availability, the option of asynchronous assessments was tabled to allow students to either download an assessment and work offline on it or to work on the assessment when they have electricity and access to Wi-Fi. These are also modes of assessments introduced to minimise cheating. Table 5 indicates these options.

Table 4*Assessment options*

Case studies	Experiential Learning Reports
Scenario-based application questions	Presentations
Individual assignments	Oral assessments
Group assignments	Peer assessments
E-portfolios	Gamification
Reflective essays	Simulations
Journaling	Multimedia projects
Work Integrated Learning Reports	

Table 5*Asynchronous options that can minimise cheating*

Different assessment options were tabled. A recommendation could be that every academic field, subject and module must choose the best options that will fit the content of their learning area to enhance their students' skills and make them employable. Every institution must also use the option that will be the best match for the available technology and digital platforms they are using. Another recommendation is that, institutions experiment with different options and encourage educators to be innovative and creative to produce a new philosophy and modes of assessment to address the challenges and needs of a digitalised world. The situation now is just the beginning of a phase of experimentation and innovation for the discipline of higher education assessments.

The study's findings empower educational managers to make informed decisions and take proactive steps in leveraging the opportunities and addressing the challenges presented by assessments in higher education. Hence, educational managers can invest in training to equip

educators with the necessary pedagogical competencies to set online and other forms of assessments. Similarly, they must ensure that the institution has the necessary software, hardware, and internet connectivity to facilitate smooth and reliable assessments; consider investing in plagiarism and cheat detection tools and implementing secure assessment procedures to maintain the credibility and fairness of the evaluation process. Educational managers and educators should design systems to offer prompt feedback and support to students needing additional assistance and explore innovative methods like gamification and interactive simulations to increase student motivation and active participation. Lastly, encourage a culture of reflection and adaptation, wherein educators regularly review and refine their assessment approaches based on student feedback and performance data.

5. Conclusion

This article evaluated the challenges and opportunities for assessments in a post-Covid world. A scoping review of the literature was done to identify the challenges, opportunities, and innovative modes of assessment introduced by other researchers. Cheating stood out as the number one challenge for online assessments in higher education.

Given the limits of the criteria set in scoping review, additional themes can be included for further studies including the potential and possibilities technology holds for innovative, credible, reliable and valid assessments. Similarly, the application of assessments in learning experience enhancing employability and 4IR skills also need further investigation. The findings of this study also generate two more areas of exploration: (1) structural conditions HEIs must implement to support students towards successful online assessments; and (2) types of assessments that contribute to creativity, problem-solving, critical thinking, analytical skills, and other expertise needed in the ever-changing world.

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