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RESEARCH REPORT FOR A MASTER'S DEGREE IN EDUCATIONAL TECHNOLOGY

Examining the underlying principles that guide the design of E-Assessment in Higher Education

BY

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ABSTRACT

This qualitative research study explores the values and perspectives of lecturers regarding contemporary e-assessment practices in a South African context. The research addresses a notable gap in the literature concerning the values and principles guiding e-assessment in the specific context of South African higher education. The overarching aim is to deepen and expand existing assessment principles to better align with the demands of contemporary e-assessment. Employing online interviews with five participants, the study utilizes Sadler's theory of formative assessment as the theoretical framework to analyze the data. The key findings reveal five essential principles guiding e-assessment: Authenticity, Deepening Engagement, Adaptation, Inclusivity, and Credibility. The study's key findings underscore the importance of reevaluating and enhancing existing assessment principles to meet the evolving landscape of digital education, particularly in South Africa.

DECLARATION

Declaration of Original Work

I, Yulene Abrahams
Student number: 1086123

know and accept that plagiarism (i.e., to use another's work and to pretend that it is one's own) is dishonest.

Please confirm the following:

☒	I declare that the Research Proposal entitled "examining the underlying principles of e-assessment." and handed in on the date below is my own work.
☒	I have acknowledged all direct quotations and paraphrased ideas.
☒	I have provided a complete, alphabetised reference list, as required by the APA method of referencing (described in the Referencing Handbook).
☒	I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.
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Signed: 

Date: 2024/02/15

Course Code: EDUC7031A- Research Report

Supervisors: Dr P. Bothma and Ms Makda

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ABBREVIATIONS

AAHE	American Association for Higher Education
AI	Artificial Intelligence
DHET	Department of Higher Education and Training
E-Assessment	Electronic Assessments
HEIs	Higher educational institutions
ICT	Information Communications Technology
JISC	Joint Information Systems Committee
LMS	Learning Management Systems
NQF	National Qualifications Framework
SAQA	South African Qualifications Authority

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CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1. INTRODUCTION

In today's rapidly evolving educational landscape, the integration of technology has transformed the way learning and assessment takes place. Higher educational institutions (HEI) are increasingly embracing digital learning environments, which offer new possibilities for engaging students and enhancing their learning experiences (Sokhanvar, Salehi & Sokhanvar, 2021). Consequently, electronic assessments (e-assessments) play a critical part in managing learning performance and achievement of learning outcomes, including, performing assessments on the students (Mo, Tang, Wu & Tang, 2022). E-assessment can make the process of assessment more efficient, as it allows for automatic marking and feedback that can be used to assess a wider range of skills, such as problem-solving and critical thinking (Mercy & Wadesango, 2020). The paper argues that existing assessment principles might not fully address the complexities of e-assessments, therefore, it is essential that HEIs implement a set of assessment principles that reflect the educational values of the institution to serve as a guide for both teaching and learning as well as assessment (Knight & Ferrell, 2022),

Assessment principles commonly serve as guiding frameworks for effective assessment that ensure the validity, reliability and fairness of assessments. They provide lecturers with essential guidelines for creating assessments that accurately measures students' knowledge, skills, and competencies (South African Qualifications Framework, 2014). However, the existing assessment principles which have been predominantly developed for traditional assessments, may not fully address the complexities and nuances of e-assessment practices. For example, McCracken, Cho, Sharif, Wilson, and Miller (2012) argue that e-assessment presents a variety of challenges and opportunities that are not inherent in traditional e-assessments, such as technical issues and the need for secure systems. In light of various e-assessment challenges some scholars have questioned whether e-assessment would compromise assessment principles such as validity, reliability, and fairness (Azizi, 2022; Mimirinis, 2019; Sa'di, Abdelraiq & Sharadgoh, 2021). Several studies argue that scholars' concerns underscore the importance of assessment principles in e-assessment practices (Mercy & Wadesango, 2020; Mc Cracken et al., 2012; Mo et al., 2022), as the study

argues that the existing assessment principles by SAQA (2014), might not fully address the complexities of e-assessment, and it might not offer the guidance needed for designing effective contemporary e-assessments. The study therefore sets out to examine how traditional assessment principles can be deepened to include the challenges and affordances of e-assessment, to explicitly guide lecturers in designing effective e-assessments.

Several studies suggest that e-assessment should be guided by more generic frameworks, given that there is a gap in this area, specifically for assessment principles to guide the design of e-assessments; as e-assessment offers a number of challenges in contrast to traditional assessments (De Villiers, Scott-Kennel & Larke, 2016; Redecker & Johannessen, 2013; Singh & De Villiers, 2017). Consequently, the purpose of this study is to investigate the need for deepening current assessment principles to design effective e-assessments with higher educational institutions. Hence, the study examines the limitations of traditional assessment principles, specifically, those outlined by the South African Qualifications Authority (SAQA, 2014); stating that assessment should be valid, reliable, transparent, fair, based on integrity, accountability, free of bias, sensitive to language, and credible. By exploring the educational values, and assessment practices of lecturers at one of Africa's top universities based in South Africa (World Ranking, 2023), this research aims to play a pivotal role in filing the gap in knowledge regarding the enhancement of assessment principles in the context of e-assessments.

An interpretivist research paradigm was adopted; thus, a qualitative research methodology and in-depth interviews were employed as the primary data collection method. Through these interviews, valuable insights were gathered to determine whether there was a need for deepening the current assessment principles. Participants were selected from diverse divisions within the faculty of Education (divisions that primarily make use of essay writing) at a South African university, to examine comprehensive perspectives, experiences, and educational values of the institution. Furthermore, Sadler's theory of formative assessment served as a cornerstone in shaping the theoretical underpinnings of this study. According to Sadler (1989), formative assessment is more than a mere judgment of correctness; it is a dynamic process that prioritizes the quality of assessment to improve and mold students' responses. This definition aligns seamlessly with the advantages offered by e-assessment, such as efficiency and immediate feedback, highlighting assessment as an ongoing and diverse procedure. Therefore, Thematic analysis was applied to

analyze the interview data, enabling the identification of recurring themes, challenges, and recommendations related to assessment principles in the context of e-assessment (Nowell, Norris, White & Moules, 2017). The findings were compared with existing literature and best practices in e-assessments and assessment principles to validate and contextualize the identified needs for improvement. The outcomes of this study could contribute to advancing assessment practices in higher education by informing the deepening of assessment principles for designing effective E-assessments.

1.2. BACKGROUND

In its simplest form, e-assessment refers to the use of technology to mediate any part of the assessment process (Burr, Chatterjee, Gibson, Coombes & Wilkinson, 2016; Mo et al., 2022 Ouellet, Lakhal, Dubé & Marceau, 2022). They encompass a wide range of digital tools and assessment formats including multiple choice questions, essays, case studies, simulations, and multimedia-based assessment. The integration of advanced technology in assessment has paved the way for what some researchers refer to as ‘authentic’ e-assessments, which encompasses various forms such as artificial intelligence, simulation, gamification, and collaborative projects (Swiecki, Khosravi, Chen, Martinez-Maldonado, Lodge, Milligan, Selwyn & Gasevic, 2022).

These assessments are novel types of e-assessment that are transforming the educational sector gradually. According to Swiecki et al. (2022), Artificial Intelligence (AI) has the potential to transform how assessments are administered in education and potentially lead to the abandonment of traditional assessments. This studies significance lies in the argument that the assessment paradigm shift (Redecker & Johannessen, 2013) requires rethinking or rather deepening of the traditional assessment principles, as the affordances and challenges presented by various e-assessment modes and platforms vary from traditional assessments. Therefore, the literature review aims to show that the generic assessment principles stated by SAQA (2014), fairness, reliability, validity, transparency, integrity, and biasness may vary due the current challenges and affordances presented by e-assessments. In addition, there might be various principles that should be considered as well when designing e-assessment, whether in its traditional form or what is referred to as authentic e-assessments. Consequently, the findings of this study can lead to the

design of a framework of principles that could potentially assist lecturers in HEIs in designing effective e-assessments.

The American Association for Higher Education (AAHE) published what is known as the principles of good practice for assessing student learning in the year of 1992 (Hutchings, Ewell & Banta, 2012). These principles were reviewed by prominent leaders in the field of assessment such as Trudy Banta and colleagues, who found these principles to be effective to date, due to the wide use and adoption of these principles in various studies and documents (Hutchings et al., 2012). Hutchings et al. (2012, p. 3) states that, "assessment is not an end in itself but a vehicle for educational improvement." Therefore, assessment practices begin with enacting the educational values of academics, as they guide assessment practices and if they are neglected then assessment could potentially become a means of measuring what is easy becomes more prominent, as opposed to assessing what is crucial (Hutchings et al., 2012). The Joint Information Systems Committee (JISC), asserts that educational principles (the guideline of creating effective assessments) should reflect the educational values and vision of an institution to produce effective assessments (Knight et al., 2022). Consequently, one can argue that the beginning of effective e-assessments starts with well thought out principles of assessment. According to Knight and Ferrell (2022), assessment principles must reflect current educational research to be effective. Considering that the literature indicates the changes in assessment dating back to the 1900s (Alruwais, Wills & Wald, 2018), it is pivotal to consider the relation between changes in assessment and the values of academics to identify possible underlying principles considered when designing e-assessments.

Assessment history dates back to the 1900s, with the oldest assessment in Higher Education coined to the University of Wisconsin, where students' outcomes and achievement were evaluated in response to accreditation requirements that assessed the effectiveness of higher education institutions (Urciuoli, 2005, as cited in De Villiers et al., 2016; Buzzeto-More & Alade, 2006). There was a great deal of debate on assessment between scholars arguing for assessing efficiency and others arguing for assessing student learning, although some maintained that the two could not be separated (De Villiers et al., 2016). This followed the establishment of the American Association for Higher Education (AAHE) in 1987 and the Higher Education Funding Council for England in 1992 (Buzzeto-More & Alade, 2006). The AAHE advocates for the recognition of learning outcomes as a common consideration for accreditation in America and has influenced

many regulatory authorities across the globe (Buzetto-More & Alade, 2006). In South-Africa, the regulatory bodies responsible for quality assurance is the South African Qualifications Authority and the Department of Higher Education and Training. Aside from the guidelines outlined by various regulatory bodies, one of the most influential techniques is the Bloom's Taxonomy of educational objectives. According to Buzetto-More and Alade (2006), it is widely believed in the assessment community that specific traits are used to define the objectives. Nevertheless, in the context of this study, the theoretical foundation is based on Sadler's theory of formative assessment, which plays a pivotal role in shaping the approach to evaluating student learning.

According to Sadler (1989), formative assessment transcends mere correctness judgments by emphasizing the quality of assessment to enhance and shape students' responses, aligning well with the dynamic nature of e-assessment. The concept of divergence, which recognizes the multiple paths students may take in responding to assessments while upholding the principle of trustworthiness (Sadler, 1989; Walton & Martin's, 2023). The theoretical framework asserts that student development and learning are inherently multidimensional, rejecting a simplistic sequential model in favor of a holistic understanding (Sadler, 1989; Walton & Martin, 2023). This orientation aligns with the acknowledgment that learners concurrently engage with diverse facets of knowledge and skills, forming the basis for a comprehensive educational experience. Within this framework, diverse e-assessment emerges as a crucial component, contributing to the multidimensional learning journey and reflecting the evolving landscape of educational assessment.

In summary, the literature indicates that academic assessment practices are influenced by the values considered significant in assessment. The study aims to explore the educational values of academics within the School of Education at a South African university, aiming to elucidate the fundamental principles guiding contemporary e-assessment methodologies. To systematically explore these principles, the study employs the South African Qualifications Authority's (SAQA) generic assessment principles (2014), encompassing validity, reliability, transparency, fairness, integrity, accountability, absence of bias, sensitivity to language, and credibility. These principles provide a comprehensive lens through Sadler's theory of formative assessment. The theoretical framework serves as a guiding perspective, illuminating and contextualizing the educational values and principles inherent in e-assessment practices. This lens has deepened our understanding of

how the identified principles align with and influence the assessment landscape, offering valuable insights for the refinement and expansion of contemporary e-assessment practices.

1.3. PROBLEM STATEMENT

Assessment principles set out the key aspects of assessment practices and they guide the approach to assessment matters, from the design to providing feedback (University of Southampton, n.d.). Traditional assessment principles that inform the assessment practices of lecturers in South Africa are defined as: valid, reliable, transparent, fair, based on integrity, accountability, free of bias, sensitive to language, and credible assessments (SAQA, 2014, p. 11-12). It should be acknowledged that the landscape of education continues to evolve, hence, it is essential to ensure that assessment practices keep pace with advancements in technology and pedagogy.

Considering, the current assessment principles have primarily been developed for traditional assessments, such as those that require face-to-face settings, it might not fully leverage the affordances and unique challenges introduced by technology integration (St-Onge et al., 2022). For example, the potential for cheating or plagiarism due to AI tools and platforms; affordances like automated scoring, authentic and engaging assessment task associated with designing contemporary e-assessments. Furthermore, the principles for assessment in SAQA (2014) are given as generic principles that have not been elaborated on. This study argues that to strengthen these principles, they must be deepened in their meaning, as the AAHE and JISC asserts that assessment principles should reflect current assessment practices and display shared academic visions and values to guide the design of assessment (Knight et al., 2022).

To optimize the use of E- assessment and maximize their effectiveness, the researcher found it necessary to identify specific areas where assessment principles need to be deepened. By exploring the experiences, perspectives, and suggestions of lecturers, involved in e-assessment practices; this study aimed to fill the gap in knowledge regarding the need for enhancing assessment principles to design and implement effective contemporary e-assessments in higher educational institutions.

RESEARCH AIMS

The study explores and recommends assessment principles for deepening assessment principles to effectively incorporate contemporary e-assessment practices in higher educational institutions in South Africa. By exploring the experiences, perspectives, and suggestions of lecturers involved in e-assessment practices, the study seeks to address gaps in current assessment principles and influence the advancement of assessment practices in higher education. The aim of the research study is to provide insights into enhancing assessment principles to design and implement more meaningful and effective e-assessments, ultimately improving the learning experiences of students in the digital age. As a result,, the study aimed to contribute to the development of assessment practices in tertiary education by addressing the need for deepening assessment principles in the context of E-assessments and promoting the development of more effective and meaningful learning experiences for students.

1.5. RESEARCH OBJECTIVES

The research objective is to explore the values lecturers hold in terms e-assessment practices in South African higher education institutions. This involves:

- Identifying specific affordances and challenges encountered by lecturers in designing e-assessment.
- To explore and make recommendations for enhancing and deepening assessment principles to design effective contemporary e-assessment.
- To provide practical insights that can inform the development of more effective e-assessment practices in higher education and promote the development of meaningful learning experiences for students.

1.6. RESEARCH QUESTION

How can the current assessment principles be deepened (expanded on) to incorporate contemporary e-assessment practices that can enhance effective e-assessment designs?

CHAPTER TWO: LITERATURE REVIEW

2.1. INTRODUCTION

The study argues that assessment principles should be deepened to remain relevant and guide lecturers in planning and executing effective e-assessments. The researcher therefore used educational data base systems such as, Science Direct, Taylor and Francis, SAGE, JSTORE, SA Journals, Willey, EBSCO host, Google Scholar to select relevant educational journals. To ensure that all the research was relevant and not outdated, journals older than the year 2013 were not considered in most cases. An exception was made for journals that dealt with assessment principles. The chapters are therefore set out to allow the reader to understand what the study adopts as contemporary assessment, how they differ from your traditional e-assessments and why it is important to keep assessment principles recent and aligned with the visions and values of the institution. By understanding the e-assessment values of lecturers, the study identified principles of contemporary e-assessment, under the theoretical framework of Sadler's formative assessment theory.

2.2 THEORETICAL FRAMEWORK

Sadler's theory of formative assessment is central to shaping the theoretical framework of this study. Sadler (1989) defines formative assessment as a process that transcends mere judgment of correctness, emphasizing the quality of assessment to enhance and shape students' responses. This definition encourages the view that assessment is an ongoing, diverse process, aligning with the benefits of e-assessment, such as efficiency and the immediate feedback it provides. According to Walton and Martin (2023), the concept of divergence addresses diverse or rather multiple paths that students may take when producing responses to assessments, while maintaining the principle of trustworthiness. The key concepts of the theoretical framework are aligned to Sadler's theory, asserting that student development and learning are inherently multidimensional, rejecting a simplistic sequential model in favor of a more holistic understanding; This perspective aligns with the recognition that learners engage with diverse facets of knowledge and skills concurrently, allowing for a richer and more comprehensive educational experience (Sadler, 1989; Walton &

Martin, 2023). The framework underscores the significance of diverse e-assessment as an integral component of this multidimensional learning journey.

According to Walton and Martin (2023) Sadler's accounts of assessments in higher education remains significant conceptually, although in practice they are difficult to implement as they reject the norms of predetermined codifications of criteria and standards in higher education. For example, Sadler's theory asserts that qualitative judgments instead of a set criterion for evaluation is required for divergent student responses (Sadler, 1989). According to Sadler (1989) to make a qualitative judgment requires the lecturer to possess expertise and knowledge of what constitutes as quality and the ability to make students aware of it. For Sadler (1989) a qualitative judgement possesses five characteristics: various standards employed in evaluating the performance quality; the incorporation of fuzzy criteria veers from distinguishing solely between correct and incorrect responses, promoting originality; a vast array of potential criteria is considered; there is no autonomous method for rendering judgments, and marks are assigned after the judgment. The advocation for qualitative judgments rejects traditional assessment practices in higher education as mentioned by Walton and Martin (2023), as a result the framework acknowledges the importance of standardization, particularly in foundational knowledge assessments in formative and summative e-assessments. Therefore, a thoughtful integration of diverse assessments, ensuring they align with specific learning outcomes are essential for this theoretical framework.

Boud et al. (2018, as cited in Walton & Martin, 2023) asserts that there has been a recent turn from a measurement orientated perception of assessment towards authentic assessments that are more complex. The assessment paradigm shift has been noted in the literature review of this study to show that changes in assessment has taken place, particularly with regards to the assertion made by Boud et al. (2018), which makes the theory of formative assessment by Sadler in e-assessment relevant. Walton and Martin (2023) devised an e-assessment course grounded in Sadler's principles, they found notable advantages such as addressing logistical intricacies inherent in instructing large student cohorts. The course incorporated adaptable rubrics, striking a balance between flexibility and robust criteria; the grading processes was less time consuming as they centered on indicators of excellence, competency, and failure; the strategic allocation of assessment activities during contact hours enhanced operational efficiency, culminating in timeous feedback (Walton & Martin, 2023). The authors emphasized the importance of showcasing the

advantages of these principles, asserting that lecturers should possess a high degree of expertise for the theory to succeed. When contemplating assessments of this nature, concerns about the validity and reliability may surface. Sadler (1989) contends that in such cases, validity alone is adequate, emphasizing that in situations where the focus is on diagnosing and improving individual pieces of work, prioritizing the accuracy of judgment supersedes the need to excessively focus on the reliability of grading. Let's consider a practical example in an educational context. Suppose a teacher is assessing a student's essay, the primary goal would be to provide constructive feedback for improvement rather than assigning a numerical grade. In this case, the teacher may prioritize the validity of the assessment by carefully analyzing the content, structure, and coherence of the essay. Instead of being overly concerned with the reliability of grading, the emphasis is on offering insightful comments that assist the student in understanding their strengths and areas for improvement. This approach aligns with Sadler's (1989) argument, where the focus on validity (providing accurate feedback) takes precedence over reliability (consistency in assigning grades) when the goal is to diagnose and enhance the student's performance.

In addition to quality feedback, students need adequate preparation for assessments, requiring them to make qualitative judgments and possess a clear understanding of the expectations (Sadler, 1989). Hence, scaffolding emerges as a crucial concept, particularly in this study's context. Scaffolding occurs when students can assess the quality of their work and regulate their actions accordingly as they work on a task (Sadler, 1989). For example, a wide range of tasks should be used holistically to achieve the end goal of assessment. According to Walton and Martin (2023), this may involve the utilization of discussion forums, which serve as a scaffold where students actively participate in meaningful interactions with both their peers and instructors, whilst fostering a more intricate comprehension compared to a monologic presentation by the students. The study, therefore, argues that a scaffolding approach to e-assessments allows for a fair and non-biased approach towards e-assessment, especially where students lack technological literacy or misunderstanding of key concepts. As students generate artifacts, such as essays, musical compositions, welding projects, or poetry, that allow for unhurried examination, the incorporation of scaffolding in the creation process involves systematically deconstructing the work, which could potentially result in a final product with very little mistakes (Sadler, 1989). However, Sadler (1989) states that it is essential to acknowledge instances where the assessment of outcomes may not

inherently incorporate qualitative judgments across diverse subject areas. In such cases, the educator is expected to possess expertise and a clear understanding of the criteria defining quality, which should be communicated to students in advance (Sadler, 1989). Moreover, the framework argues for the inherent connection between assessment practices and high order thinking skills (Sadler, 1989). Consequently, the framework could potentially address challenges like cheating and the digital divide in e-assessment by promoting authentic tasks that require critical thinking and creativity, making it harder for students to cheat, and by advocating for inclusive assessment practices that accommodate diverse technological access and literacy levels. Furthermore, the study argues that assessments should be designed not merely to measure rote memorization but to stimulate critical thinking, analytical reasoning, and the synthesis of knowledge (Sadler, 1989). By integrating on-going assessments into the learning process, affords students with frequent opportunities to receive feedback, identify areas for improvement, and refine their understanding (Sadler, 1989).

In the context of contemporary e-assessment, Sadler's theory emerges as particularly advantageous, offering a multifaceted approach that aligns with the dynamic nature of digital learning environments. Sadler's principles, emphasizing formative assessment as a continuous process, provide a framework that accommodates the fluidity and adaptability inherent in online educational settings. The capacity for immediate feedback is especially valuable in e-assessment, promoting timely insights for learners and facilitating iterative improvement. Furthermore, the focus on qualitative judgment (the cornerstone of Sadler's theory) rather than mere correctness aligns well with the nuanced nature of digital tasks, allowing for a more comprehensive evaluation of students' understanding and creativity (Sadler, 1989). The flexibility inherent in Sadler's approach enables the design of e-assessment rubrics that can accommodate a diverse range of tasks and learning outcomes, making it a fitting and advantageous theoretical foundation for designing contemporary e-assessments.

2.3. THE CONCEPTUAL SHIFT IN ASSESSMENT

Many researchers have argued that assessment, including feedback plays an essential part in developing students academically, professionally, and personally (Mottiar, Byrne, Gorham & Robinson, 2022). According to the South African Qualifications Authority (2014, p. 4) assessment is "the process used to identify, gather, and interpret information and evidence against the required

competencies in a qualification, part-qualification, or professional designation in order to make a judgement about a student's achievement." Quinlan and Pitt (2021) simply defined assessment as a cycle meant to make inferences about student learning as they engage in task to generate data that will be used as evidence to support claims. One can summarise assessment as a two-fold process, in that it either informs the students about their weaknesses and strengths in a particular module, and it allows the educator to monitor and identify students' weaknesses and strengths in a particular area to intervene by means of remediation (Boussakuk, Bouchboua, Ghazi, Bekkali & Fattah 2021). On the other hand, assessment is used to determine whether a student has achieved the main objectives in a module (Boussakuk et al., 2021), this determines a student's competencies for a qualification (SAQA, 2014). As a result, the focus of the study is on formative e-assessment, however the reference to summative e-assessment as one of the oldest types of assessment is included.

Stödberg (2012) states that the use of ICT for assessment is known as e-assessment. E-assessment has been widely adopted in HEIs and plays a pivotal role in assessing large number of students (Mo et al., 2022). De Villiers et al. (2016) adopted the definition of e-assessment as a process that involves the use of ICT in gathering and analyzing information about student learning. Mo et al. (2022) states that e-assessment uses ICT to conduct any form of assessment such as assignments, examinations, and evaluation through e-assessment systems. This study defined e-assessment according to the definition by JISC, who defines e-assessment as the implementation of technology as the mediator of every part (preparation, delivery, analysis, reporting) of the assessment process, whether it be computer-based assessment or computer assisted assessment (Burr et al., 2016; Redeker & Johannessen, 2013; St Onge et al., 2021; Stödberg, 2012). Stödberg's (2012) perspective on e-assessment as a comprehensive process (including formative and summative assessment) aligns with the holistic nature of modern educational assessment. E-assessment encompasses more than just the final test or exam; it includes the entire journey from planning and designing assessments to delivering them, collecting data, and providing feedback. This view acknowledges the importance of using various digital tools and platforms to enhance assessment practices. In this light, e-assessment becomes an integrated part of the learning process, offering opportunities for ongoing feedback and improvement, ultimately leading to more effective teaching and learning outcomes.

2.3.1. FORMATIVE AND SUMMATIVE E-ASSESSMENT

Assessments can take many forms, it can be either formal or informal to test whether learning has been accomplished, or they can test learning that will be forthcoming to shape teaching and learning that remains ahead (SAQA, 2014). In summative assessments, students are assessed at the end of a learning program for a particular qualification (SAQA, 2014; Stödberg, 2012). According to Chu (2014) assessment for learning is recognized amongst researchers as a fundamental element for conducting learning activities, especially when designing web-based learning environments. Sadler's (1989) definition of formative assessment is particularly useful in the context of this, as he described it as the way evaluation/judgements about the students' responses (assignments, works), focusing particularly on the quality thereof to improve and shape the competences of students.

Assessment for learning (formative assessment) primarily focuses on ensuring that assessment is designed in a manner that enhances students' learning (Quinlan & Pitt, 2021), as it is primarily designed to feed into further learning (SAQA, 2014). Different modes and platforms like Moodle, Google Forms, Quizizz, Mentimeter, Powtoon, Kahoot are usually the preferred use for formative e-assessment as it can create surveys, platforms for discussions, games, quizzes, and online assessments (Mo et al., 2022). The collected data from e-assessment is used not only for lecturers to determine students' weaknesses and strengths, but provides immediate feedback to students, leaving room for self-regulation and improvement of learning (Boussakuk et al., 2021; Mo et al., 2022; Redecker & Johannessen, 2013; St-Onge et al., 2021).

In this regard, the study asserts that ICT is extremely beneficial for formative assessment, as it allows for continuous assessment and immediate feedback, whilst minimizing the workload of the educator. One can assert that it has greater potential for improving teaching and learning, however, this does not imply summative e-assessments are not fundamental, as e-assessments can assess large amounts of students at the same time, thus, it lessens the workload of lecturers (St-Onge et al., 2021). Summative assessment occurs at the conclusion of a learning program or course (SAQA, 2014). They are administered after formative assessments to assess the final achievement of students. The purpose of summative assessment is to evaluate the extent to which the candidate has achieved or has not achieved the learning objectives of a learning program (Boussakuk et al., 2021; SAQA, 2014;). According to Zegowitz (2023) several research studies have revealed that

when e-assessments are scheduled periodically (and counts towards a small percentage of marks) they can increase student engagement with the learning material, and therefore have a positive effect on the outcomes of summative assessment scores.

As a result, the study argued that for e-assessments to be successful in avoiding biasness toward students who lack technological literacy, formative assessment should be administered continuously (Zegowitz, 2023), and in conjunction with summative e-assessment as the one feed into the other. Consequently, this opposes arguments that e-assessment is a tool of biasness, especially for poorer learners who lack the necessary ICT skills. For example, Areekkukzhiyil (2019) criticizes contemporary assessments as a tool of oppression, which subject's students to bias. For Areekkukzhiyil (2019), it is debatable whether contemporary assessment practices can be valid, reliable, fair, and the use thereof should be limited. However, if various ICT tools, modes and platforms for formative e-assessment are applied continuously, then it can better prepare students for summative e-assessments, as they might become accustomed to it (Zegowitz, 2023). The study does not reject the concerns highlighted by Areekkukzhiyil (2019), but rather welcomes them as challenges of e-assessment that differ from traditional assessment methods. It also zooms into benefits of e-assessment that sets it apart from traditional assessment practices, thus, arguing that the current e-assessment practices should be deepened to include e-assessment practices due to their distinct difference in affordances and challenges.

2.3.2. E-ASSESSMENT AFFORDANCE AND CHALLENGES

Assessment can take place either in a classroom, lab or remotely through learning environments or learning management systems (LMS), which can be accessed by computer, tablet, phone, or any other device with internet access (Burr et al., 2016). Contemporary assessment methods allow for more collaboration, creativity, and critical thinking that provides skills linked to the real-world. For example, contemporary assessment methods allow for online quizzes, simulations, gamification of assignments, collaborative and reflective journals, podcasts; these have unique benefits and challenges in comparison with traditional methods, which usually composes of ordinary means of assessment, such as standardized tests and exams that measure knowledge understanding (Mujtaba, Reynolds, Parkash & Singh, 2021). The following tools are commonly used to assess whether learning outcomes have been achieved: multiple choice questions, true and false, short answers, quizzes and essays (Mujtaba et al., 2021). E-assessment, on the other hand,

has been developed and implemented in a variety of ways due to many innovations in its design and implementation (Gipps, 1999, as cited in Mimirinis, 2019). Therefore, its objective must be more than merely obtaining certification, but also enhancing student engagement, improving assessment quality, and creating real-world experiences for students (Mimirinis, 2019). Modern assessments like game-based assessment can be used to infer students' proficiency levels in real time (Bahari, 2021). Other e-assessments can decrease the amount of time spent on grading by being flexible in terms of time and location using LMS and various web 2.0 tools, including blogging and podcasting (Bahari, 2021).

While e-assessment offers unique benefits over traditional assessment, it is also plagued by unique challenges, such as the need to verify that the person offering the assessment is the actual student undertaking the assessment (cheating) and the work submitted is original (St-Onge et al., 2022; Okada et al., 2019; Mimirinis, 2019). Within a South African context, it brings forth an even bigger challenge or rather hinderance to e-assessment known as load shedding. According to Malatji and Baloyi (2023) loadshedding are power cuts, implemented for maintenance and other reasons, have disrupted the normal course of teaching, and learning activities. These intermittent outages have particularly affected online classes, leading to disruptions in live sessions and hindering tasks that rely on electricity during power cuts, thus, both students and lecturers must find alternative means to continue their studies (Malatji & Baloyi, 2023). The problem extends to online teaching and learning activities, especially assessments, as the connectivity disruptions create difficulties with network (Malatji & Baloyi, 2023). Despite efforts by some universities to provide students with data bundles for internet access, these measures prove insufficient for effective e-learning (Malatji & Baloyi, 2023), as the persistent occurrence of load shedding coincides with the ongoing shift to virtual learning systems, exacerbating challenges within the e-learning landscape that poses a significant challenge to South African universities (Malatji & Baloyi, 2023).

Furthermore, another major challenge is the consequences of the digital divide on low-income students; students with limited computer literacy skills and the possibility of anxiety (St-Onge et al., 2022; Burr et al., 2016). Whitelock (2009, as cited in Stödberg, 2012), emphasizes the importance of using e-assessments in a manner that does not disadvantage students. Therefore, the researcher acknowledges that e-assessment can result in unfair assessment practices, especially for low-income students, as stated by St-Onge et al. (2022) and Areekkukzhiyil (2019). Consequently,

this study argues that e-assessment-based research is crucial, since it provides academics with an opportunity to discuss how they have overcome multiple challenges they have encountered. As research shows that e-assessment is a powerful tool to assess and accommodate all students' abilities and intelligences, as well as prepare students for real-world situations (Mujtaba et al., 2021). Understanding the intricacies of the various principles and how they interact with one another is a vital step in successfully implementing e-assessment in any educational setting. A key argument is that e-assessment principles are essential to ensure that every student is assessed fairly, without bias, in a valid and reliable manner, and so on (Bahari, 2021). It is necessary to examine the various principles relevant to e-assessment for successful contemporary e-assessments.

2.3.3. THE ASSESSMENT PARADIGM SHIFT

The administration of assessment has witnessed various changes with the times, one of the most important changes in assessment is the mode and tools used to assess leaners in the 21st century (Redecker & Johannessen, 2013). According to Sokhanvar et al. (2021), assessment in higher education is one component that experienced rapid change. Redecker and Johannessen (2013) refers to it as a paradigm shift, from pen and study to the use of ICT that has brought about new ways of teaching and learning and assessing. According to De Villiers et al. (2016) for e-assessment to be effective it must offer distinct benefits over traditional assessments. A major difference between traditional assessment and contemporary is that change has not only occurred in how assessment is administered but also in the skills and competences needed in society and the workplace (Redecker & Johannessen, 2013). According to Redecker and Johannessen (2013), figure 1 below illustrates the application of e-assessment in its traditional form (like pen and paper) has shifted conceptually from knowledge to what is known as competence-based learning (21st century types of e-assessment).

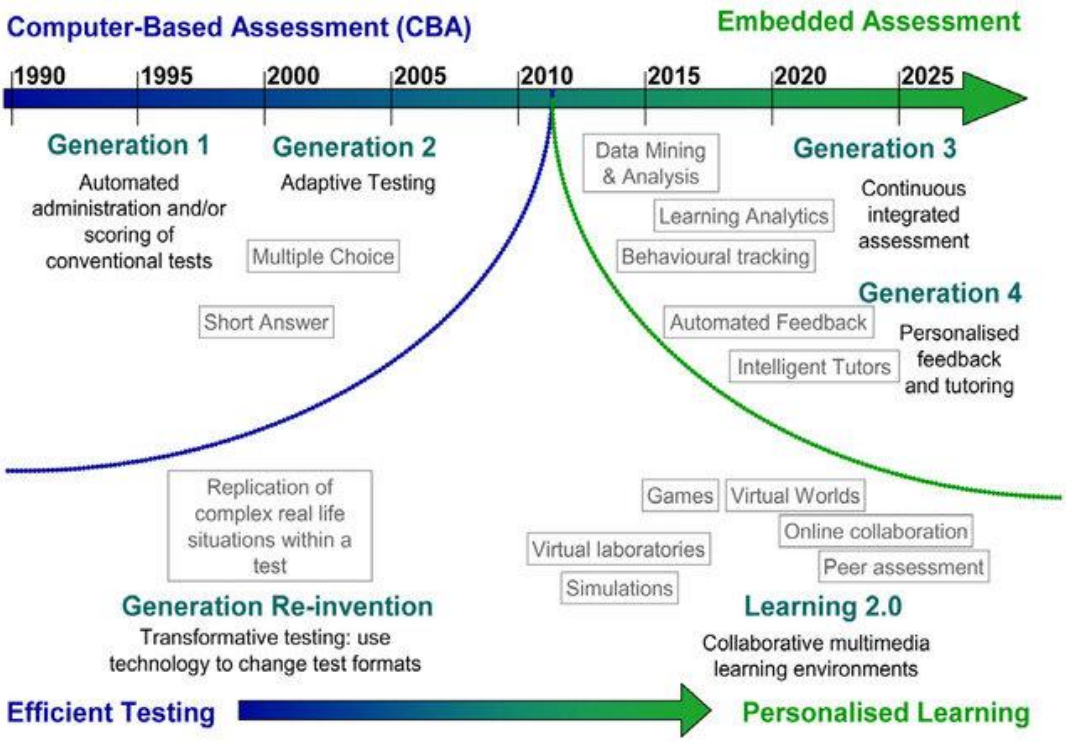


Figure 1: Current and future e-Assessment strategies Source: IPTS on the basis of Bennett, 2010; Bunderson, et al., 1989; Martin, 2008). Permission to use the figure granted by author Christine Redecker.

The first and second generations of e-assessments are labeled as traditional as the focus was more on efficiency of assessment (Matin, 2008, as cited in Redecker & Johannessen, 2013). On the contrary, generation three and four tests afford the ability to test skills that are highly complex, transversal skills and competences that are needed for the workplace (Redecker & Johannessen, 2013). Many researchers refer to generation 3 and 4 testing as authentic assessment and oppose the 1st and 2nd generation testing onus and unable to prepare students with the skills required for society. Stödberg (2012) classifies traditional e-assessment, generation 1 and 2 tests as closed questions (CQ includes multiple choice questions, extended matching, labelling, image hotspot, true and false, fill in the blanks, re-ordering, drag and drop,); open ended questions (OEQ includes questions without explicit answer alternatives and written essays); portfolios used as e-assessments; products in the form of prototypes etc.; and discussions among students used as e-assessments. Various researchers have pointed out the need for authentic assessments in higher education (Sokhanvar et al., 2021) as they can be viewed as part of generation 3 and 4 assessments. Authentic assessment is defined as assessments that allow students to apply competencies,

knowledge and attitudes that are required in real life scenarios as the criterion for assessment (Gulikers et al., 2018, as cited in Sokhanvar et al., 2021). Authentic assessment is claimed to be a substitute for traditional assessment as students are expected to possess the capabilities of an employee in the field of study, thus improving student engagement in learning and in their professional community (Sokhanvar et al., 2021). However, the researcher has found the term authentic to be very conflicting in Higher Education, therefore, for the sake of clarity, authentic e-assessment in this study refers to any assessment regardless of the mode or platform that encourages assessing authentic knowledge based on real world experiences (Sokhanvar, et al. 2021). Traditional assessments (multiple choice questions, essays, short and long answers) are argued to infer student knowledge and learning, which has several issues such as being onerous for lecturers to design, and they lack adaptability, therefore they are found to be inauthentic (Swiecki et al., 2022).

Consequently, for large sized classrooms designing assessments manually can be a difficult task (Swiecki et al., 2022). According to Swiecki et al. (2022), the design of traditional assessment may inform lecturers about the students' abilities, however, they only provide snapshots thereof and neglect to inform about learning. Therefore, traditional assessments have the potential to neglect one of assessments main goals which is to foster learning (Swiecki et al., 2022). Areekkukzhiyil (2019) argues that contemporary assessment presents the potential of bias in assessment, and that it may not be fair to students who are not technologically literate. In contrast to this argument, Swiecki et al. (2022) argues that traditional assessment falls short of adapting assessments to the students' prior knowledge, experiences and abilities, and their cultural and social backgrounds, hence, these types of assessments are viewed as one size fits all. Consequently, bias is also present as all students may not have equal opportunity to show their learning. An example is academic writing, where students may be asked to write essays. Those with a professional writing background may excel in writing essays, whereas students who lack in this regard may fall short (Swiecki et al., 2022). This does not mean that they lack the knowledge on the topic, but rather that they do not have the ability to put what they know on study, thus subjecting the student to a form of bias. Nevertheless, despite the benefits of contemporary assessments, traditional assessments remain persistent in the culture of education (Swiecki et al., 2022). Technology such as Artificial Intelligence (AI) has significant abilities to transform traditional assessments with all the affordances of contemporary e-assessments.

2.3.4. THE IMPACT OF AI IN ASSESSMENT

According to McGrath, Pargman, Juth, Palmgreen (2023) universities play a crucial role in society through their research and innovation by transforming insights into value changing practices, it also involves renegotiating of complex relationship between emerging technology and institutional traditions of teaching and learning. AI is anticipated to have a significant impact on education in the near future (McGrath et al., 2023), as the use of AI with traditional assessment practices can enhance the assessment design (Swiecki et al., 2022). They offload tasks from human to AI and help to make assessment more feasible and improve traditional assessment questions (Swiecki et al., 2022). AI shows the potential to transform generation 1 and 2 assessments into generation 3 and 4 assessments. For example, AI enabled assessment using traditional assessment such as essay writing, has the same benefits of contemporary assessments (automated marking and immediate feedback) and challenges, yet it is presented in traditional forms of assessments. Swiecki et al. (2022) proposes that employing MI Write can enhance students' writing abilities by providing a comprehensive score based on six aspects: idea development, essay organization, writing style, word selection, sentence fluency, and adherence to conventions. This tool aims to help students pinpoint areas for enhancement in their essays. Past studies indicate that MI Write can enhance students' writing skills like their motivation to write, their writing skills and self-efficacy.

On the contrary, some AI platforms result in the opposite effect by creating a dependence on the intelligence of the machine rather than the human. This could potentially threaten the ability of learners to make their own inferences and voice their own opinions on certain topics. Gasevic et al. (2023) argues that AI enabled assessments has opened the possibility to assist students in auto generated essays such as ChatGPT, which brings about the possibility of sidelining professional expertise and placing accountability in the hands of programmers, thus restricting the role of pedagogy in assessment. The result of this is the possibility of humans trusting AI more than their own opinion (Gasevic et al., 2023). According to Sweeny (2023), ChatGPT uses algorithms to produce predictive text to create new content in response to questions or prompts posted by users. ChatGPT can produce grammatically accurate essays and the result can be used to compile credible looking academic writing that may be undetectable by anti-plagiarism software (Sweeny, 2023). It is essential for all stakeholders to engage in discussion and reflect on the affordance and rising challenges because of ICT and AI enabled assessments in HEI, more specifically the threat on the

authenticity of academic writing. Therefore, it is essential to reiterate the significance of reflecting on current academic practices to examine the underlying principles of designing e-assessments.

Contemporary e-assessments can incorporate multimedia in assessments, present questions in a preset or random order, provide rapid and personalized feedback, item analysis and times snaps for every action and response made by the examiner (Swiecki et al., 2022). Swiecki et al. (2022) suggest that these snapshots can be used to investigate suspected misconduct and detect rapid guessing and free knowledge behaviors. They further propose that this modeling can help educators understand student performance in complex problem-solving scenarios. While traditional assessment practices have intended to judge an artifact produced by learners, for example, an essay exam; it has been difficult to track the learning process as it is very time and resource intensive due to collecting and organizing data (Swiecki et al., 2022). The integration of AI in assessments offers advantages and challenges. While it enhances the feasibility of monitoring student learning and engagement, there is a concern regarding the authenticity of assessments, particularly in regard to AI-generated essays. Consequently, these acclaimed artefacts such as traditional essays in a traditional setting could be found to be more authentic in essence because of the threat that AI presents to academic essays, which is also an essential component of assessment in HEI. Nevertheless, AI enabled assessments does have its benefits, for example, techniques have been developed to adjust to students' abilities giving them tailored assessment experiences and making adaptive testing possible (Swiecki et al., 2022). However, one could argue that the challenges outweigh the benefits due to the threat on originality.

Gasevic et al. (2023) emphasizes that the consequences of AI platforms results in new challenges, such as how learners should be assessed when an academic paper (essay) can be created with acceptable writing quality with merely one prompt within seconds. Taking into consideration how AI connects to human learning and assessment is essential. Assessment should assist students to cultivate the skills needed to navigate the complexities of future challenges they may encounter in their professional or personal lives. Going forward this will involve active engagement and collaboration with AI (Gasevic et al., 2021). The new assessment methods, which include generating tasks, recommending peer graders, and automatic grading, face a significant challenge. This challenge involves potentially diminishing the role of professional expertise and reducing accountability (Gasevic et al., 2021; Swiecki et al., 2022). These challenges threaten the integrity

of assessments, therefore, it's crucial to strike a balance between AI and teacher decision-making to ensure that lecturers can effectively engage with assessments as a pedagogical activity (Swiecki et al., 2022). It is also essential to ensure that students are engaging with the teaching content, and they are completing their own assessments to uphold the purpose and the value of assessment, which is meant to prepare students for the workplace.

According to Sweeny (2023), academic dishonesty refers to deceptive or unfair actions aimed at achieving a more favorable outcome on exams, assignments, or other assessments. The term essay milling and contract cheating forms part of cheating that involves students paying a third party to produce an assessment that they submit as if it was their own work (Sweeny, 2023). The arrival of advanced check bot like ChatGPT is considered an issue of concern as it inflicts real and conversive damage on universities and academic integrity (Sweeny, 2023). Sweeny (2023) argues that AI platforms such as ChatGPT undermines academic standards and the credibility of higher education worldwide. These challenges form the scope of the problem that this study aims to address. To combat the risks of challenges presented by AI and contemporary e-assessments, this study argues that assessment principles should include both the challenges and affordances of ICT and AI in assessment to guide academics when designing assessments.

2.4. PRINCIPLES OF ASSESSMENT

2.4.1. The Importance of Assessment Principles

Assessment principles are important guidelines that help shape responsible and effective assessment practices, contributing to improving education and supporting academics in enhancing student learning (Kinzie et al., 2014). Assessment practices serve different purposes, such as designing assessments, carrying them out, providing feedback, and guiding students (Areekkuzhiyil, 2014). It's crucial to explore how academics approach assessment for learning because it allows us to understand the knowledge, values, and principles that influence their decisions when creating and implementing assessments (Quinlan & Pitt, 2021). According to Burr et al. (2016), e-assessment should focus on evaluating how well a chosen option, among others, can achieve the desired learning outcomes. Therefore, this study aims to examine various principles for effectively designing e-assessments, starting with SAQA’s assessment principles, to identify the most effective ones for e-assessment.

A case study conducted by NILOA discovered that assessment is most effective when its purpose is to enhance learning and when it aligns with the educational values of an institution (Kinzie et al., 2014). Consequently, reflecting on good practices in higher education is crucial because it mirrors the values of both the institution and its lecturers. According to Hutchings, Ewell, and Banta (2012), what is assessed and how it is assessed should be guided by lecturers' educational values. Assessment is an ongoing practice, and the constant evolution of tools and platforms has led to many changes in how we gather information about learning (Sokhanvar et al., 2021). Therefore, delving into educational values is essential, as highlighted by Hutchings et al. (2012), who emphasize that assessment principles serve as foundational ideas for thinking about assessment. This means that, from planning to feedback, the assessment process begins with assessment principles that are rooted in the assessment values held by institutions and lecturers. Ultimately, the design of assessments is influenced by these values. Hence, this study aims to investigate the values that lecturers uphold regarding contemporary e-assessments, aiming to build upon/extend or add to the general principles outlined by SAQA (2014) and establish a shared understanding of the values and purposes of assessment, as advocated by Hutchings et al. (2012).

Currently, there are notable shifts in the values associated with contemporary e-assessment in Higher Education Institutions (HEIs). It is essential to question whether these traditional values align with the objectives of contemporary e-assessment. The swift changes in assessment practices may lead academics to either adhere to traditional values and maintain the status quo or adapt their values to align with the current demands, including the call for authenticity in e-assessment (Sokhanvar et al., 2021). This chapter critically examines both traditional and contemporary assessment principles, aiming to assess their relevance and applicability in the evolving landscape of e-assessment.

2.4.2. THE ASSOCIATION FOR HIGHER EDUCATION (AAHE)- GOOD PRACTICES

The nine assessment principles established by the American Association for Higher Education (AAHE) have been enduring since their inception in 1992 (Kinzie, Jankowski & Provezis, 2014). Hutchings et al. (2012) note that these principles serve as the bedrock for assessment practices, as many institutions have adopted shared aspects of these principles as the foundation for their assessment approaches. Institutions commonly base their assessment practices on sets of principles, whether determined internally or by a country's qualifications authority for Higher

Education Institutions (Kinzie et al., 2014). For instance, in 2014, Trudy Banta, an assessment specialist, reviewed the nine AAHE principles (which emphasize that assessment begins with educational value, learning is multidimensional, has a clearly stated purpose, requires attention to outcomes, is ongoing, involves the community, is relevant to real-life issues, promotes change, and lecturers take responsibility for their roles). The conclusion drawn from the review was that these principles remain effective and relevant (Kinzie et al., 2014). Given that these principles are rooted in educational values and the purpose of assessment, exploring the values held by academics toward contemporary e-assessment becomes essential to augment traditional assessment principles in the study's argument.

The AAHE principles of good practices according to Hutchings, Ewell and Banta (2012, p. 3-4) includes:

> *P1. Assessment should be based on educational values.*
>
> *P2. Assessment is effective when it shows that learning is multidimensional.*
>
> *P3. Assessment works better when it aims to improve learning.*
>
> *P4. Assessment requires attention to outcomes and experiences that led to those outcomes.*
>
> *P5. Assessment works best when it is ongoing.*
>
> *P6. Assessment fosters wider improvement when all stakeholders are involved.*
>
> *P7. Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.*
>
> *P8. Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promotes change.*
>
> *P9. Through assessment, educators meet responsibilities to students and to the public. There is compelling public stake in education.*

The significance of assessment in higher education lies in its alignment with specific goals, making assessment a goal-driven process (P3). This goal-oriented approach allows for the comparison of outcomes against set objectives, facilitating the evaluation of learning effectiveness and the continuous improvement of assessment design (P4-P5). Contemporary e-assessments, with their automated marking and immediate feedback capabilities, play a pivotal role in tracking learner performance and addressing misconceptions promptly, thereby enhancing the learning experience. Additionally, assessment is viewed as a collaborative activity (P6) involving various stakeholders

such as students, lecturers, course designers, administrators, alumni, the broader society, and employers (Hutchings et al., 2012). There is a growing emphasis on basing assessments on authenticity, preparing students for employment, necessitating collaboration with stakeholders to define authenticity within each qualification (P2).

The introduction of Information and Communication Technology (ICT) in education, including AI, has brought about changes in assessment practices, but the adoption of these technologies varies across institutions. Despite HEIs being recognized as leaders in research and innovation, the implementation of new technologies often progresses slowly (P8). This highlights the importance of understanding and addressing the values held by lecturers, as P8 asserts that changes in assessment are most influenced by these values rather than technological advancements alone. Educational values, as emphasized by P1, drive the decisions on what and how lecturers choose to assess. Therefore, for effective change in assessment practices, lecturers must be actively involved in the research process. This research is guided by the principle of exploring lecturers' values in contemporary e-assessments to uncover the underlying principles, with the aim of extending SAQA's (2014) generic assessment principles.

2.4.3. SAQA- ASSESSMENT PRINCIPLES

Assessment design holds a crucial role within the curriculum, commencing in the early stages of course module development (McAlphine, 2002). The formulation of assessments is inherently guided by assessment values. As previously noted, Hutchings et al. (2014) argue that the content and method of assessment are influenced by the values embraced by lecturers. These values, often depicted as assessment principles, are encapsulated in the National Policy and Criteria for Designing and Implementing Assessment for NQF Qualifications and Part-Qualifications and Professional Designations in South Africa (the national policy). This framework, aligned with the goals of the National Qualifications Framework (NQF) Act 67 of 2008 in South Africa (SAQA, 2014), offers standards and guidance for effective assessment. Importantly, these key principles are crafted recognizing the existence of diverse national policies rooted in varying assessment principles and scopes (SAQA, 2014). Hence, they are intended to be utilized in conjunction with principles from various institutions. The national policy serves as a guide, establishing a minimum standard for achieving effective assessments aligned with the NQF Act 67 of 2008 (SAQA, 2014).

This study aims to investigate whether the national policy's minimum standards for effective assessments can also guide contemporary e-assessments effectively. Consequently, the exploration delves into how these key principles can be enriched by examining the values held by lecturers at a South African university. The national policy recommends that Higher Education Institutions (HEIs) in South Africa adhere to the following specified principles when conducting assessments (SAQA, 2014, p. 11-12):

1. ***Valid****: in that it measures that which it sets out to measure.*
2. ***Reliable****: where measures produce similar results under consistent conditions.*
3. ***Integrity****: honesty in the assessment process.*
4. ***Transparent****: all parties clearly understand the processes.*
5. ***Accountability****: the role players acknowledge and account for their responsibilities.*
6. ***Fairness****: learners are assessed on what they know and have been taught.*
7. ***Absence of bias****: assessments do not in any way advantage or disadvantage particular learners or groups of learners.*
8. ***Sensitivity to language****: avoid causing language to come with variants in learning.*
9. ***Credibility****: physical and other conditions under which assessment is conducted do not unfairly prejudice assessment activities and outcomes.*

McAlphine (2002) highlights values consistent with the national policy, including validity, reliability, transparency, and impartiality, asserting their role as frameworks to ensure the appropriateness of assessments for their intended purposes. Emphasizing the importance of timely feedback in his practical guide for lecturers, McAlphine (2002) underscores its role in enabling students to understand and address mistakes effectively. The AAHE echoes this sentiment, asserting the effectiveness of assessments aimed at enhancing learning (Hutchings et al., 2014). While acknowledging the myriad values contributing to effective assessment, the inherent trade-offs among principles make achieving all of them in every assessment impractical. For instance, the preference for essays as an assessment method may introduce bias if a learner excels in multimedia presentations but struggles with written essays. However, this doesn't negate the value

of essays as an assessment method. Assessment, as highlighted by McAlphine (2002), should embrace diversity, reflecting lecturers' recognition of the multidimensional nature of learning (Hutchings et al., 2014). The significance of values in assessment design, McAlphine (2002) argues, ultimately depends on their alignment with the intended purpose.

Furthermore, effective assessment standards, according to McAlphine (2002) and SAQA (2014), should align with the principles of validity, ensuring instructors measure precisely what they intend to assess. For instance, when assessing problem-solving skills, the focus should extend beyond written content presentation to encompass the solutions offered (McAlphine, 2002). This aligns with reliability, ensuring that the assessment of problem-solving can be approached diversely while yielding consistent results. The paramount principle of fairness guides instructors to evaluate students based on their knowledge, communicate clear learning outcomes, and design transparent assessments (Hutchings et al., 2014; McAlphine, 2002; SAQA, 2014;). Timely feedback is indispensable for students to understand and rectify mistakes, promoting learning (Hutchings et al., 2014; McAlphine, 2002). Instructors should incorporate feedback considerations when crafting assessments, potentially fostering student engagement with course materials and accountability among stakeholders (Hutchings et al., 2014; McAlphine, 2002; SAQA, 2014). Given the ongoing nature of assessment, engagement with stakeholders becomes imperative, making authenticity a foundational consideration in effective assessment design, aligning with the goal of equipping students with workplace-relevant skills.

2.4.4. CONTEMPORARY E-ASSESSMENT PRINCIPLES

In contemporary educational settings, the integration ICT has significantly impacted the landscape of assessment practices. Traditional methods, now enhanced by ICT applications, coexist with emerging principles governing electronic assessments (e-assessments). McCracken et al. (2013) proposed six key design principles for e-assessment, emphasizing elements such as affordances, alignment of objectives with assessments, discipline-specific considerations, prompt feedback, authentication, transferability, and transparency. Grounded in an ethnographic study, these principles guide the thorough design and execution of e-assessment strategies, particularly in the context of blended and online learning practices within the realm of international business education. These principles have played a pivotal role in informing the seven principles for e-assessment put forth by De Villiers et al. (2016, p. 72-82):

1. *Affordances:* E-assessment should afford responsiveness, flexibility to the content delivery, feedback and increase engagement by both educator and students.
2. *Alignment*: assessment strategies and tools align with learning outcomes.
3. *Articulation:* clear assessment requirements and dialogue during the process.
4. *Accountability:* All parties should be fully accountable throughout assessment and have a clear understanding of their responsibilities.
5. *Accreditation:* Informs the students of the standard against which he/she has to perform. It includes validity and reliability, which is viewed differently in e-assessment as opposed to TA. Gikandi et al. (2011, p. 78, as cited in de Villiers et al., 2016), states that validity is the extent to which further learning is promoted and reliability is dependent on multiple sources of evidence of learning, documenting, and monitoring them and clarifying the assessment criteria.
6. *Adaptation:* Multi-dimensional approaches to assessment through a diverse range of opportunities for students to demonstrate their competencies and skills to enhance learning.
7. *Authenticity:* E-assessment is credible and authentic when it includes real-world experience.

2.4.5. CONCLUSION

The multidimensional perspective on student learning, continuous assessment for growth, promotion of high-order thinking, and emphasis on qualitative judgment, as encapsulated in the theoretical framework, aligns with the call for more explanatory and specific assessment principles in higher education through the application of Sadlers formative assessment theory. The framework provides a lens through which the traditional nature of SAQA's generic principles can be critically examined. Furthermore, it supports the assertion that contemporary e-assessment practices necessitate a more nuanced set of principles. By grounding the conclusion in this theoretical framework, the study not only critiques existing principles but also advocates for a paradigm shift toward more comprehensive and tailored principles that reflect the complex dynamics of modern education and assessment practices. In conclusion, the theoretical framework serves as the intellectual scaffold that underpins the arguments presented in this study regarding SAQA's assessment principles, the AAHE assessment principles and De Villiers et al. (2019) e-assessment principles.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. RESEARCH METHODOLOGY

The literature review process involved a search for relevant literature using reputable databases to ensure relevant educational journals were selected. These databases were accessible through the WITS library database, including ERIC, Oxford University Press, SAGE, JSTOR, ProQuest Educational Journals, SpringerLinks, Taylor and Francis, Wiley, and Google Scholar. To ensure the currency of sources, the search focused on literature published within the past ten years (2013-2023), and utilized keywords such as 'e-assessment,' 'electronic-assessment,' 'computer-based assessment,' 'assessment practices,' and 'e-assessment principles.' To delve into the collection of data, an interpretivist paradigm was embraced, and a qualitative research methodology was employed as the most suitable research methodology to respond to the research question, whilst maintaining ethical practices.

The methodological approach was grounded in a naturalist perspective and centered on interviews as the primary data-gathering technique. Positioned as an observer in the research process, in line with Guba and Lincoln's (1989) framework, the researcher prioritized the perspectives and beliefs of lecturers to achieve the aims and objectives of the study, which is deepening SAQA's current assessment principles. The researcher focused on lecturers who have experience in designing assessment for both contemporary and traditional e-assessments to provide a contextual understanding of the dynamics between existing principles and emerging practices. This aligned well with the goal of deepening current assessment principles. This approach placed the views of lecturers at the forefront of the study, allowing the researcher to discern how lecturers interpret their surrounding academic environment and articulate knowledge (Guba & Lincoln, 1989).

3.2. RESEARCH PARADIGM

The study adopted an interpretivist research paradigm to shape its research approach. Merriam (2009) posits that individuals construct meaning as they endeavor to interpret and make sense of the world, implying an active engagement in the interpretation process. Consequently, the study was purposefully aligned with a constructivist ontological stance and highlighted the subjective and socially constructed nature of reality. It acknowledged that individuals played an active role in creating meaning and interpreting their experiences within the realm of e-assessment practices. The study argued that existing knowledge on e-assessment predominantly stems from traditional assessment practices. Moreover, traditional and contemporary assessment practices exhibit notable differences, particularly in terms of challenges and affordances. As a result, the researcher argued that these distinct practices call for a deepening of the current traditional e-assessment practices, in alignment with contemporary e-assessment practices. Consequently, the study advocated for the exploration of unique principles specific to e-assessment practices.

To comprehend the reality of the phenomena under investigation, the researcher adopted a methodology centered on interviews with lecturers. By engaging with knowledgeable individuals in the field of assessment, particularly those involved in designing e-assessment courses and e-assessments in their courses in both contemporary and traditional formats. This methodological choice was informed by Kivuja and Alini's (2017) perspectives, which emphasized an epistemology grounded in authoritative knowledge derived from individuals who are well-versed in the subject matter and holding leadership positions within their organizations. Consequently, experts were interviewed to explore whether they perceived a distinction between contemporary and traditional e-assessment practices, and their e-assessment values were explored to answer the research question.

3.3. RESEARCH DESIGN

The study employed a qualitative research design to investigate the amalgamation of contemporary e-assessment practices with existing assessment principles. The primary focus was on comprehending the experiences, perceptions, and meanings associated with these practices. The

decision to opt for a qualitative research approach was informed by Merriam (2009), who suggests that this methodology is particularly effective for researchers interested in understanding how individuals interpret their experiences and attribute meaning to them. Qualitative inquiry, as outlined by Merriam (2009), prioritized the exploration of meaning within its contextual framework, employing various interpretive techniques such as description, decoding, translation, and understanding of phenomena.

Adhering to a naturalistic approach, this study unfolded in a real-world setting, as semi-structured interviews were conducted to gather valuable insights into the values that academics employ in designing e-assessments (Merriam, 2009). The collected data was utilized to formulate a framework intended to serve as a guide for academics in planning e-assessments. The efficacy of this research method was underscored by the success demonstrated in previous work by De Villiers et al. (2016), who developed the seven A's as a guiding framework for academics in business studies. When comparing the research findings, the researcher drew on a diverse range of national and international assessment principles. Thematic analysis methods were applied to extract meaningful patterns and insights that contribute to a deeper understanding of e-assessment principles and their application in contemporary educational contexts.

3.4. PARTICIPANTS

For this study, experienced participants were selected from the School of Education at a South African university X, ranging from novices to experienced lecturers with varying levels of proficiency in contemporary electronic assessment practices. Consequently, the researcher adhered to a pre-established sample size and sample composition, guided by Creswell (1998, as cited by Beitin, 2012), who recommends a range of five to twenty-five participants for qualitative research studies. Therefore, the sample consisted of five knowledgeable participants selected for individual interviews. Prior to engaging participants, the researcher secured permission from the university, and upon obtaining approval, participants were contacted via email (Appendix A & Appendix B, p. 62). This initial communication provided information about the research, its purpose, and procedures, which allowed participants to make an informed decision about their participation on the research. In adherence to ethical guidelines highlighted by Anabo et al. (2019), participants were assured of their autonomy throughout the research process. They were explicitly

informed of their right not to participate in or discuss specific topics and had the freedom to withdraw from the current study at any point.

The initial phase involved participants responding to demographic questions, followed by an inquiry to assess their understanding or knowledge of contemporary e-assessment. Participants lacking a sufficient grasp of the distinction between contemporary and traditional assessment methods were excluded from the study. Consequently, data from two participants were not utilized, resulting in a final sample size of five participants for the research study. To conduct interviews, Microsoft Teams was employed, offering a secure online platform that facilitated recording and transcription with explicit permission from all participants. The assurance of anonymity was conveyed to participants to uphold their privacy rights. Interviews were scheduled based on the availability of participants, accommodating a duration of 60 to 90 minutes. The interview questions were posed organically, following the flow of conversation and responses, to ensure a naturalistic setting conducive to rich and authentic data collection (Appendix C, p. 62-62).

3.5. DATA ANALYSIS

The data collected from the interviews (transcribed notes and recordings) were analyzed using Nowell, Norris, White and Moules' (2017, p.) six steps of Thematic Analysis, which is argued to produce trustworthy and insightful findings:

1. The researcher will archive the raw data from notes, transcripts and copies will be made to gain familiarity with the data.
2. The researcher will generate initial codes by identifying important sections from the notes and attaching labels to index them according to their relation to themes in the data.
3. A list with all the codes generated from data will be extracted into themes depending on relevance. This will bring a sense of identity, thus, meaning to the data.
4. At this step, the themes' validity will be reviewed to ensure they accurately reflect meaning derived from the data and changes will be made accordingly.
5. Themes were defined and named by determining the aspects they present in the literature (Appendix D, p. 62-63) . This followed a detailed analysis.
6. Once themes are fully established, the write up of a thematic analysis should provide a concise, logical account of the data across themes, validated by the literature.

The researcher systematically pursued the objective of acquiring insights into the existing state of assessment principles and their efficacy in shaping contemporary e-assessments. The primary aim was to ascertain the need for change and to delineate the nature of such changes. To accomplish this, the initial step involved the implementation of thematic analysis, commencing with a thorough familiarization with the raw data. This entailed meticulous readings of notes and transcripts on multiple occasions before progressing to the thematic coding phase.

The thematic coding process encompassed the identification and labeling of recurrent themes and patterns evident within the data. Several codes emerged from this analysis, representing distinct facets inherent in the information. These codes were subsequently synthesized into overarching themes, each associated with a specific aspect delineated in the existing literature. This methodical approach allowed for a comprehensive exploration of the data, facilitating a nuanced understanding of the multifaceted dimensions inherent in contemporary e-assessment design principles.

3.6. ETHICAL CONSIDERATIONS

The researcher maintained a commitment to ethical conduct throughout every stage of the research process, starting with the recruitment of participants according to ethical clearance standard. The researcher participated in an ethics training course and underwent an assessment upon its completion to acquire an ethical clearance certificate (protocol number: 2023ECE004). Recognizing the importance of just and informed consent in participant recruitment (Al-Khatib and Kalichman, 2019); the researcher sought permission from the registrar of a Higher Education Institution (HEI) in South Africa to approach academics for interviews. Each participant received a consent form and a research information sheet, outlining the research's nature and purpose. Submission of the form prior to the interview ensured that participants had the opportunity to inquire about the study and withdraw at any point. To safeguard confidentiality, participants were labeled from A to D in no particular order. Respecting participants' autonomy, the researcher fostered an environment where each participant could freely express their views without interruption or scrutiny. Notes were diligently taken during the interviews and recorded with the participants' permission on Microsoft Teams.

To mitigate the risk of harm, participants' confidentiality was preserved by keeping their names anonymous, and they were informed that the collected data would be securely stored, such as in a locked safe (Anabo et al., 2019). As a further step to ensure the protection of participants, transcribed notes from the interviews were sent back to each participant for verification checks. This feedback loop aimed to enhance the validity and reliability of the data (Anabo et al., 2019). Once participants verified the authenticity of the transcribed interviews, the researcher proceeded to conduct a thematic analysis of the data. This meticulous process adhered to ethical principles, ensuring participant well-being, privacy, and the integrity of the research findings.

3.7. LIMITATIONS

Several limitations characterize this study. First, the findings may have limited generalizability due to the study's focus on one specific HEI in South Africa. The practices and perspectives observed may not be representative of the broader educational landscape. Second, the small sample size of five participants might restrict the broader applicability of the results. A more extensive and diverse participant pool could enhance the study's comprehensiveness. Additionally, the reliance on self-reported data, particularly regarding participants' understanding of contemporary e-assessment, introduces the potential for bias. The study's exclusive use of semi-structured interviews as the primary data collection method may also limit the breadth of insights. Temporal constraints within the 2013-2023 timeframe may not capture the most recent developments in e-assessment practices. Furthermore, the study predominantly explores lecturers' perspectives, potentially overlooking valuable insights from other stakeholders and students. Lastly, resource constraints may have influenced the decision to focus on a single institution, limiting the study's scope and the richness of the data collected. Acknowledging these limitations is essential for a nuanced interpretation of the study's findings and provides avenues for future research improvements.

3.8. CONCLUSION

In conclusion, the research methodology for this study involved a systematic approach to investigating the integration of contemporary e-assessment practices with existing assessment principles. An interpretivist paradigm was adopted, and a qualitative research design was used,

grounded in a naturalistic perspective. Semi-structured interviews were chosen as the primary data collection method to delve into the perspectives and beliefs of lecturers regarding e-assessment.

The thematic analysis of the data revealed key themes that underscored the need to transition from traditional to contemporary e-assessment practices. Ethical considerations were paramount throughout the research process, including participant recruitment and confidentiality measures, ensuring the protection of participants' rights.

However, the study's limitations, such as its focus on a specific institution and the small sample size, may have impacted the generalizability of the findings. Despite these limitations, this research contributes valuable insights into the complexities of contemporary e-assessment practices and lays the groundwork for future studies in this area. By exploring lecturers' perspectives, this study advances the discourse on e-assessment principles, aiming to enhance the design and implementation of e-assessments in educational contexts. Therefore, chapter four delves deeper into the meaning of the themes: navigating challenges and maximizing opportunity and unveiling contemporary e-assessment values according to the literature, to make meaning of the themes. Furthermore, it interpreted and discussed the findings from the data to explore potential e-assessment principles for contemporary assessments.

CHAPTER FOUR: RESULTS AND ANALYSIS

4.1. RESULTS, INTERPRETATION AND DISCUSSION

This chapter marks a significant phase in the study, as it presents and makes sense of the data collected on educational values in relation to e-assessment principles. The research process involved steps from transcription to thematic analysis. After carefully transcribing the interviews and successfully obtaining participant verification, the transcripts underwent multiple readings for the researcher to familiarize themselves with the data as stated in Nowell et al.'s (2017) first step of thematic analysis. The coding of data in accordance with step two of thematic analysis revealed substantial similarities in responses, facilitating a smooth initiation of the coding process. The initial set of codes encompassed a spectrum of topics, including the benefits and challenges of e-assessment, the values inherent in assessment and techniques associated with the design of e-assessment.

These codes were subsequently organized into two overarching themes (creating themes from codes, thematic analysis step three): (1) Benefits and Challenges of e-assessment and (2) The values of E-assessment. In accordance to step four and five in thematic analysis, the themes were to directly reflect aspects of the literature review, hence, the researcher found the themes relevant to the literature and no changes were made. Following step number 6, the write-up of the thematic analysis should offer a clear and concise account of the data within the established themes. This presentation is to be substantiated by literature, ensuring that the findings are not only logically organized but also validated by relevant academic sources (Nowell et al., 2017). The subsequent sections provide the data across the identified themes, which includes the participants' perspectives with insights derived from scholarly works through the lenses a Sadler's formative assessment framework as the basis of the studies theoretical view.

THEME 1: NAVIGATING CHALLENGES AND MAXIMIZING OPPORTUNITIES

The consideration of affordances and challenges associated with contemporary e-assessment emerged as a pivotal aspect influencing lecturers' value of e-assessment. This theme took precedence during the coding process, reflecting its significance in shaping the design of contemporary e-assessment. As corroborated by existing literature, the affordances and challenges of e-assessment hold substantial sway over whether learners embrace or resist its implementation.

1. TIMING

Notably, within the South African context, an empirical challenge highlighted in the data was loadshedding-a phenomenon wherein electricity is intentionally cut off for allocated hours during specific days. According to Malatji and Baloyi (2023) The challenge of load shedding significantly disrupts the continuity and effectiveness of e-assessment. The intermittent power outages directly impact online classes, causing disruptions during live sessions and impeding tasks that require a stable electricity supply (Malatji & Baloyi, 2023). This unique challenge adds a practical layer to the broader discussion on the aspect of *"timing"* when designing contemporary e-assessment in South African educational settings.

> *'In South Africa, problems like loadshedding plays a crucial role in how contemporary e-assessments are timed, I wouldn't give an exam that was timed a timed e-assessment that had to be done in a space of time because somebody somewhere is going to be affected by it' (Participant A, p. 7).*
>
> *According to Participant B (p. 3), 'how you set the time is essential because loadshedding schedules are different for students, so assessment must be set in such a way that learners can have access to the assessment with minimal problems, and that means that you as a lecturer must be available to assist the student, whether by adding additional time and so forth'.*
>
> *Participant C (p .8) states that, 'it is important that you do allow sufficient time especially because we have constant blackouts like loadshedding which affects everything'.*

Building upon the insights of Participants A and B, Participant C (p. 8) further emphasizes the significance of allowing sufficient time in e-assessment planning. Their perspective underscores the pervasive impact of constant blackouts, exemplified by loadshedding, on various aspects. As highlighted by Participant C, the consideration of ample time allocation becomes paramount in mitigating the challenges posed by interruptions such as loadshedding, reinforcing the intricate

relationship between Timing and the broader contextual factors shaping contemporary e-assessment practices. Participant A's reluctance to impose timed assessments (p. 7) due to the pervasive impact of loadshedding sets the stage for a nuanced understanding. The successful planning of e-assessments necessitates a careful consideration of external contextual challenges, so that learners would be able to navigate through the assessment with minimal hinderances.

> *'You need to factor in these challenges and try and set assessments that aren't too complex, so that students can navigate the assessment easily, also, it is very important to know your student cohort and what their skill level is and their ability to master or negotiate key concepts, I think this is very important when your designing assessments'(Participant C, p. 8).*

Participant C underscores the need for a proactive approach that factors in these challenges. This involves crafting assessments with a level of complexity that students can navigate seamlessly, recognizing the potential disruptions caused by external factors. Researchers believe that e-assessment enhances learning through immediate feedback by providing students with insights into their misconceptions, as well as facilitating self-regulation (Mo et al., 2022; St Onge et al., 2021; Boussakuk et al., 2021). Therefore, the emphasis on knowing the student cohort, including their skill levels and ability to grasp key concepts, highlights the personalized aspect of assessment design that could potentially facilitate self-regulation. This is consistent with Sadler's (1989) theoretical framework, wherein formative assessments are crafted to enhance and mold students' competencies. In the South African context, this also involves accounting for external factors that could pose challenges to the effective delivery of assessments.

> '*Online assessment offers more flexibility, being able to go back and revise things, working at your own time and having a record of lectures was a benefit (Participant E, p. 8).'*

Timing was not merely based on challenges as multiple benefits were discussed within this principle.

> '*Immediate feedback makes one aware of student characteristics, if there is a problem or if students haven't mastered certain concepts or skills then you can address it immediately in the course by supplementing it in one way or another whether it be in adding to the online readings or unpacking it in the tutorial session. This actually gives you the opportunity to actually analyze students as ability to apply what they've learned,' (Participant C, p. 10).*

One of the most voiced opportunities in terms of e-assessment is the relation to immediate feedback, for example, Participant C (p. 5) adds that,

> *'Immediate feedback in e-assessment becomes very beneficial especially with large classes of 400 to 500 students where it's nearly impossible to provide feedback to all of them.'*

A primary benefit of e-assessment is that it can assess large amounts of students and lessen the workload of lecturers (St-Onge et al., 2022). In essence, effective e-assessment design requires a careful balance of complexity and adaptability, informed by a deep understanding of the student population's unique dynamics and potential challenges. Timing is therefore a key principle to consider when designing contemporary e-assessments in a South African context, as it can either serve as a benefit or a challenge. Ultimately, being prepared and aware of external challenges related to e-assessment are crucial to administering successful contemporary e-assessments. The advantage is that e-assessments are flexible and can decrease the workload of marking large classes (Bahari, 2021). As a result, it can offer prompt feedback to both lecturers and students (Bahari, 2021), which can inform lecturers about the specific needs of the student cohort.

2. DIGITAL LITERACY

The literature presented a lack or limited amount of digital literacy as a major challenge in e-assessment (St-Onge et al., 2022; Burr et al., 2016). Consequently, the findings from the data suggests that scaffolding assumes a central role in the design of e-assessments, particularly when confronted with challenges related to students' potential lack of digital literacy or unfamiliarity with the tools and platforms employed by lecturers. In this context, scaffolding tasks emerged as a prominent and crucial topic.

> *'I think the lecturer and student familiarity with technology is important. They should be scaffolding stuff, for example, when you are using different E-tools scaffolding stuff can assist in creating familiarity and minimize cheating' (Participant A, p. 7).*

Participant A, believes that digital literacy is a challenge in e-assessment, however, this challenge is conquered through scaffolding tasks as Participant C (p. 10):

> *'Your assessment opportunities need to be scaffolded in a way that they prepare students for a summative or formative assessment later on'.*
>
> *Participant B: 'You can give students experience of different platforms by setting short assessment tasks and various assessments.'*

The ability to scaffold a task effectively requires the lecturer to be digital literate. Participant B (p. 8) elaborates that:

> *'I think it is very important to familiarize yourself with all tools available and to be aware of how that assessment tool works. I don't want to be constrained by my lack of knowledge of how to use a digital tool because then I will not be able to achieve what I want to achieve in terms of getting the outcome or testing or assessing students in various ways. Lecturers showed practice and familiarize themselves with various digital tools and platforms.'*

The challenge of digital literacy on the part of the lecturer can be mitigated easily by a lecturer's desire to acquire knowledge and willingness to learn more about how various e-assessment tools and platforms work together to enhance the assessment experience. Ultimately, digital literacy is mitigated through practice and scaffolding as not knowing is a choice. Moreover, Zegowitz (2023) asserts that to avoid biasness towards students lacking technological literacy, continuous administration of formative assessment before the summative assessment is recommended, as the former informs and contributes to the latter.

> *'I think that it goes with quite a lot of labor in making things familiar to students and becoming familiar with tools yourself, to benefit from the affordances in the E-landscape; as there's exploration, there's trial and error and there's trying it over years and hour (Participant A, p.3).'*

Acquiring new knowledge in the realm of e-assessment involves a significant amount of trial and error. Yet, when planning e-assessments, it is essential to keep the course goals, outcomes, and objectives in focus.

> *'Your e-assessment has to be clear and you have to indicate to students exactly what your expectations are, and work through the rubric so that students may understand where the marks are coming from' (Participant C, p. 11).*

This consideration facilitates a seamless progression from formative to summative e-assessments, achieved through the thoughtful scaffolding of tasks. The principle of scaffolding is an essential principle for designing and administering successful contemporary e-assessments. However, one of the foremost concerns in the realm of assessment is the potential for cheating facilitated by artificial intelligence.

3. CHEATING

Throughout the interviews, all participants consistently expressed shared concerns regarding academic essay cheating. Academic essays, being integral to higher education, have garnered

heightened apprehension due to the potential exploitation of Artificial Intelligence (AI) systems, notably ChatGPT, raising significant concerns about academic integrity. AI did leave its mark in the findings of the study; however, the focus was exclusively on the challenges rather than the potential benefits of AI in contemporary e-assessment. Swiecki (2022) contends that AI could serve as a tool to help students practice their writing skills through platforms like MI Write. While the role of academic writing emerges in the data, it is primarily highlighted as a potential source of academic misconduct. Sweeney (2023) defines academic misconduct as a deceitful or unfair act intended to produce a more desirable outcome on any form of assessment. Sweeney (2023) regards the emergence of check bots like ChatGPT, alongside other AI generators, as a novel threat to academic integrity. These tools are seen to pose a risk by causing tangible and conversational harm to the reputation of universities (Sweeney, 2023).

> *'The most challenging aspect is that students cheat and are using ChatGPT. Obviously, cheating has always been a concern where students had someone else complete their assignments, but this is the first time that we really encountered anything like this. Having run a whole response for academic writing is going to be a huge challenge going forward because students are already doing this in exam. There could be instances where cheating was not picked up especially at undergraduate level when you have huge classes of 600 students. Some of these students might fall through the cracks if they're not adequately addressed. I think it's very easy for an undergraduate student to plagiarize or to commit academic misconduct several times and then arrive at postgraduate level, and they're not able or they don't have the course content knowledge and they don't have the writing skills as they're not familiar with the discourse (Participant C, p. 5). '*

The concerns of AI generated responses in Education are not to be taken lightly, as this is an issue that's must be addressed with high priority. Automatically generated essays produced by AI-enabled systems, like ChatGPT, can produce grammatically accurate essays that are undetectable by anti-plagiarism software (Gasevic et al., 2023; Sweeny, 2023). Consequently, there is a risk that individuals may come to place more trust in AI-generated content than in their own opinions, additionally, it raises the prospect of sidelining professional expertise and transferring accountability to programmers (Gasevic et al., 2023).

> *Participant D (p. 7) states that, 'I want my job to be about engaging with students' thinking. I do not want to be thinking whether a response by a student was AI generated or is this original, rather than what's the quality of this answer. As I think it can undermine my role*

> *as an academic because we still want to know what humans think and human beings use knowledge.'*

To address the cheating concerns, Participant C, appears to revert to traditional summative assessments, such as sit-in exams reluctantly. However, Participants A and B introduced an intriguing approach that might effectively mitigate the challenges associated with cheating in e-assessment.

> *'It is important for a lecturer to consider how they ask questions when designing summative e-assessments. These questions should not be explicit in a way that learners could find answers from content easily but rather it should motivate students to be creative and apply knowledge. Using Higher order questions, and problem-solving questions can motivate learners to engage with the content. This includes the aspect of scaffolding course content and to show that memorizing or route learning will disadvantage them as they need to understand the content to apply successfully', (Participant B, p. 4).*

In addition, Participant A (p. 4) states that:

> *I have designed different kinds of take-home online exams in different ways, this included podcast and teacher portfolios that required students to reflect on what they had learned in class and how they took those concepts to put them into their portfolio. So, that is quite difficult to pull from ChatGPT because it has a lot of personal knowledge. The podcast also has a written reflection on what the podcast process was like, what was difficult, what was exciting, and what was learned from the process. I think that testing or authentic knowledge has something to do with the person as well and that is not about testing generic knowledge that can be produced by anybody at any point. Authentic knowledge relates to the person's process of learning as well as to link the process of learning to what they have learned and to explain those two in an interconnected way. I don't think that can be done right by ChatGPT.*

Participant B advocates for strategic question framing, urging instructors to steer clear of explicit queries that facilitate easy content retrieval. Instead, the emphasis lies on crafting questions that foster creativity and the practical application of knowledge, particularly through higher-order and problem-solving inquiries. Mujtaba et al. (2021), argues that contemporary assessment enables greater collaboration, creativity, and critical thinking aligned with real-world experiences. This is achieved through diverse methods such as reflective journaling, podcasts, and discussion platforms, distinguishing these forms of assessment from traditional e-assessments (Mujtaba et al., 2021). Participant A underscores the critical role of thoughtful design in summative e-assessments and formative e-assessments to deter cheating and cultivate authentic engagement. To improve

assessment quality and to create real world experiences for students the objective of contemporary e-assessment must not merely be to obtain certification but also to enhance student engagement (Mimirinis, 2019).

Scaffolding course content is proposed to highlight the disadvantage of rote memorization compared to a deeper understanding for successful application. On the other hand, Participant A introduces innovative e-assessment formats, such as podcasts and teacher portfolios, designed to elicit reflective insights from students. The participant argues that assessing authentic knowledge involves probing the individual's learning process and linking it intricately to acquired knowledge. A notable solution to challenges associated with cheating emerges as AI systems, exemplified by ChatGPT, may struggle to capture the personal and authentic dimensions of student learning, particularly in the context of reflective and experiential assessments where learners are encouraged to produce two types of artefacts. For example, students will submit a podcast and an essay that reflects on their thinking as they engage with the task. This type of assessment is referred to as authentic assessment in the context of this study. Therefore, the researcher argues that there is a need for a deepening assessment principle to accommodate contemporary e-assessment and to encourage the design of authentic contemporary e-assessments.

THEME 2: UNVEILING CONTEMPORARY E-ASSESSMENT VALUES

This theme seeks to unravel the intricacies of contemporary e-assessment design and unveil the values associated with the design thereof. Although the primary emphasis is on the values embraced by lecturers as foundational principles in designing effective contemporary e-assessments, this study also explores participants' perspectives on whether contemporary e-assessment differs from traditional assessment as one of the sub-themes.

1. CONTEMPORARY E-ASSESSMENT VS TRADITIONAL E-ASSESSMENT

For the research focus of this study, participants who perceived no distinction between e-assessment and traditional methods were intentionally excluded, particularly in instances where limited experience in designing contemporary assessments could potentially impede data collection. The participants in this research explicitly recognize a difference between traditional and contemporary assessment, although the collected data indicates varying perspectives in their understanding.

> *'I was very resistant towards e-assessment before COVID, and I think that was because what I understood by e-assessment was multiple choice. I do understand that there is a lot of nuances with multiple choice now, but I didn't understand that then. I flat out refused to try and assess my courses which is a writing subject and reading subject using multiple choice. Now, I understand a lot more and since COVID, I have been trying different ways of assessing in my courses. I think there's a lot more that can be offered in contemporary assessment than in traditional assessment due to the advancements in contemporary assessment' (Participant A, p. 2).*

Participant A's response reflects a notable shift in attitude towards e-assessment, particularly shaped by a pre-COVID resistance that was rooted in a limited perception of e-assessment as primarily multiple-choice. The acknowledgment of nuances in multiple-choice assessments indicates a growing awareness and understanding. The participant's initial reluctance to employ multiple-choice assessments for writing and reading subjects underscores a traditional approach to assessment methods in these domains. However, the impact of COVID prompted a change in perspective, leading to a willingness to explore diverse assessment methods.

Participant B (p. 1) acknowledges that there is a difference mainly due to the ability to provide immediate feedback, however deeper into the interview participant B (p. 7) stated:

> *You can set e-assessment questions that encourages students to do some practical work but if they were using paper-based assessment, they would be doing the same thing. The only difference is that they will be interacting with technology to get an immediate response. E-assessment allows us to benefit from the affordance of immediate feedback.*

The acknowledgment that setting e-assessment questions can prompt students to engage in practical work is a notable observation, and the participant suggests that this practical aspect is not fundamentally different from what students might do in a paper-based assessment. The crucial differentiator, as pointed out, is the interaction with technology, offering students the advantage of immediate feedback. This recognition indicates that affordances of contemporary e-assessment separate it from traditional forms of assessment (paper based). However, this response indicates that the term contemporary e-assessment still carries vast misconceptions amongst some lecturers as a similar response was identified in the response of Participant E (p. 1):

> *'It depends on if it is fit for purpose, whether it's a blog or an essay the student still must write up their insights into something. So, the substantive doesn't change, all that changes is the mode as you are assessing core knowledge.'*

The findings showed a notable resistance when it came to asserting that assessment goals could be achieved both on paper and electronically. As the intention of this study is not to engage in a debate on this matter but rather to highlight that a distinction exists in the approach and value associated with designing for traditional assessments compared to crafting contemporary e-assessments. Nevertheless, an to appreciate contemporary e-assessments goes beyond the affordances to a deeper understanding of the potential it has on being meaningful for students.

> *'My new perception of contemporary e-assessment comes from an understanding of authentic assessment, especially in my particular interest of decolonizing assessment. I think there's a relationship between authentic and decolonizing assessment as there is a lot of space for student voice. Assessment needs to be meaningful to students and this can play havoc with things of validity and reliability because humans are not all going to get the same answers. But I think that's fine and that's ideal because students are not the same. And I think that's one of the problems with assessment is that it can be very universalizing' (Participant A, p. 3).*

Participant A embraces a more inclusive, student-centered, and authentic approach, which could potentially hinder validity and reliability in its traditional form. However, Sadler (1989) asserts that when designing assessments of this nature validity alone is adequate. This perspective challenges the universalizing tendency in traditional assessments and promotes a more personalized and meaningful approach to evaluation. According to Swiecki (2022), traditional assessments that do not incorporate a students' prior knowledge, experience, abilities, cultural backgrounds tend to be a one size fits all assessment. Participant A acknowledged that diversity amongst students as crucial, and uniform outcomes should not be anticipated. Swiecki (2022) characterizes this expectation as a form of bias, recognizing that not all students may have equal opportunities to showcase their learning. Swiecki (2022) highlighted that some students might struggle with writing academic essays due to insufficient proficiency in academic writing. This deficiency does not imply a lack of knowledge on the subject but rather underscores the need for skill refinement (Swiecki, 2022). Furthermore, this argument becomes a subject of debate concerning the significance of reliability in assessment principles, as potentially leading to a burdensome approach to assessment.

> *'I think with contemporary e-assessment you can be more creative with some of the assessments that you generate online. The multimodal aspects that can be incorporated can engage students more than in traditional assessments. But I also think that one of the keys especially in language learning and literacy development is discussion and creating*

> *opportunities for students to actually engage with academic discourse, to use it and to expand on their thinking about how it's relevant and applicable' (Participant C, p. 4)*

Participant C aligns with the perspective that contemporary e-assessment has the potential to meaningfully engage students with course content. This alignment, however, does not diminish the value of traditional methods in testing core content knowledge. The acknowledgment here is that a variety of assessments, including traditional approaches, plays a crucial role in enhancing educational outcomes related to course content. The findings underscore not only the distinction between contemporary e-assessment and traditional approaches but also reveal variations in lecturers' perceptions of contemporary assessment, potentially hindering their full acceptance of these modern methods.

The researcher advocates for a balanced assessment approach that incorporates both higher-order and lower-order assessments to ensure diversity in assessment methods. Nevertheless, the scope and the purpose of the study is not meant to delve into dissecting lecturers' perceptions of contemporary versus traditional assessments but rather to explore their existing values to design effective contemporary e-assessment. In essence, the finding showed that contemporary e-assessment is distinct from traditional counterparts due to the affordances and challenges associated with them. This indicates that there is room for deepening the current assessment principles as outlined by SAQA (2014). Therefore, the researcher elaborates on a potential option for achieving the aim of the study in the findings section of the study.

2. ASSESSING AUTHENTIC KNOWLEDGE

The recognition of assessing authentic knowledge emerged as a fundamental value shared among the participants. Authentic assessment is characterized by evaluations that necessitate students to apply competencies, knowledge, and attitudes in real-life scenarios, serving as the criteria for assessment (Sokhanvar et al., 2021). These real-life scenarios are often linked to skills relevant to the workplace (Sokhanvar et al., 2021). However, the understanding of authenticity, as derived from the findings, varied in terms of its association with workplace skills.

> *'...Authentic assessment can be overlaid into contemporary assessment. I think that some people approach assessment from the position that students must know everything about the course and if the exam is used almost try and catch them out and I think that it's very unhelpful because for me it doesn't really test knowledge, it tests cramming. Whereas if students have a longer time with what concepts they're going to use, what things they're going to bring in, they*

> *have choices that they can make, and they're deciding what was important for them in the course. And I think that you're testing a much more authentic form of knowledge rather than just what knowledge can be absorbed and regurgitated. So, I think that it's helpful if you're doing assessment in that way when you're trying to get a genuine sense of what the students have understood by a certain thing or from a course' (Participant A, p. 4).*

Participant A advocates for assessments that allow students more time to engage with concepts, make choices, and decide what is important to them in the course. This, according to the participant, results in a more authentic form of knowledge testing, moving beyond mere absorption and regurgitation of information. The view of participant A on testing authentic knowledge, aligns with concerns advocated by researchers who view traditional forms of learning as onerous, in that they provide snapshots of student performances rather than a nuanced view of learning (Swiecki et al., 2022). The view presented aligns authentic knowledge with a deeper understanding and emphasizes the importance of providing students with the opportunity to showcase their genuine comprehension of course content.

> *'I try and link assessments to something that students will find relevant and meaningful. It's not completing an assessment just for the sake of completion, they've got to see the value in completing the assessment. To try and make them real life, linked to problem solving and an opportunity to engage with one another as well. In terms of accessing and discussing the content and the application of that content to whatever scenario. I think that's very important; students have to see how what it is that they expected to do is directly relevant to their learning and the application of that learning going forward' (Participant C, p. 3).*

Participant C articulates a belief that assessments should not exist in isolation but should connect directly to students' understanding and application of content in various scenarios. This viewpoint highlights the significance of contextualizing assessments, enabling students to perceive the direct relevance of what they are expected. Therefore, Swiecki (2022), advocates for an approach to assessment that involves the personal aspects of students for it to be meaningful, for example, cultural background, something that students can relate to. To ascertain whether the participant believed that assessing authentic knowledge pertains specifically to workplace knowledge, Participant C (p. 3) responded:

> *'One issue that I think we're supposed to prepare students for a skill set for a future that we can't envision, we have no idea what the expectations are going to be 10 to 15 years from now, especially in terms of technology. I think that all stakeholders would need to work very closely*

> *together to provide students with opportunities to develop the skills that we think they might need going forward in whichever profession that might be.'*

The participant addresses a critical challenge in education—the preparation of students for a future characterized by rapidly evolving expectations and technological advancements. This underscores the dynamic nature of the professional landscape and the difficulty in predicting specific demands. The participant advocates for a collaborative effort among all stakeholders, emphasizing the need for close cooperation to ensure students are afforded opportunities to cultivate skills that are deemed essential for their future professions. Participant A (p. 4) makes a supporting statement to what Participant C has said by asserting that:

> *'I think that the testing of authentic knowledge has something to do with the person. It's not about testing generic knowledge that can be produced by machine or by any other person and it will be the same, for me authentic knowledge relates to the person's process of learning.*

Both participants assert that in contemporary assessment, authenticity should not be boxed into the concept of workplace knowledge as it is a broad concept.

> *Contemporary e-assessment has to be relevant; they've got to measure students' ability to apply what it is that they're learning. I think those are critical things, so not just a superficial understanding of content or concepts but measuring both theoretical concepts and the application of those concepts to real life scenarios is key with any assessment, in my opinion' (Participant B, p. 4).*

They emphasize that authenticity embodies a personalized form of knowledge that defies easy universalization. Authentic knowledge, according to their perspectives, is intricately tied to an individual's thinking and experiences related to theoretical concepts.

> *'I think that it needs to reflect on and explore the growth of the student rather than just a point of arrival in some kind of knowledge. It needs to explore the connections between the students as well and the course. In my opinion, this is what makes assessment fair, assessment should not be isolated from the students' lives and their experiences. It needs to be accessible to a whole range of different people that are in the class (Participant A, p.5).'*

This recognizes authenticity as a value that contributes to principles such as relevance, accessibility and fairness in guiding the design of contemporary e-assessments, broadens the scope of the meaning of authenticity. By emphasizing the importance of capturing and evaluating the

unique thinking and experiences of each learner to ensure fairness and accessibility overlaps into the value of engagement in assessment.

3. DEEPENING ENGAGEMENT

The recognition of deepening engagement emerges as a fundamental value in contemporary assessment. This perspective underscores the importance of designing assessments that not only enhance learner engagement with course materials but also encourage interaction and engagement among peers.

> *Participant A (p. 5), 'I think in being accessible to the whole range of different people that are in my class scaffolding plays an important role off providing multiple access points. As you represent one question and it's not going to be linguistically accessible for everybody, that is why there should be multiple scaffolding points to help accessibility and that also helps fairness as it needs to explore the knowledge in the course in a kind of deep and dynamic way how.'*

This value aligns with the broader goal of creating a dynamic and participatory learning environment, where assessments serve as catalysts for meaningful student interaction and active engagement with the course content.

> *'When designing an online module…every task has to have a very deep pedagogical lesson to get students to engage with' (Participant E, p.3).*

In a South African context, engaging in a course requires participation, and participation is often impacted by external factors such as loadshedding, which can hinder engagement. Participant E (p. 4) states that:

> *To enable participation, inclusivity was a big principle for me. For example, it was online but we zero rated the site, we made every single module data light and data bundles were provided for the students. Then because we know that there's intermittent electricity and Wi-Fi, we put all materials into a resource book, so even if students were not having connectivity, they had a backup hard copy resource.'*

In this statement, the participant emphasizes the crucial principle of inclusivity in facilitating participation. The challenges related to the digital divide is a great concern, especially in e-assessment of all kinds (Burr et al., 2016; St-Onge et al., 2022). The consideration of challenges like intermittent electricity and Wi-Fi disruptions is evident in the decision to compile all materials into a resource book, ensuring that students have a backup hard copy resource, thereby

accommodating a diverse range of circumstances such as the digital divide. Studies indicate that effects of the digital divide on low-income students, includes the possibility of limited literacy skills and possible effects of anxiety (St-Onge et al., 2022; Burr et al., 2016). Therefore, the approach mentioned by Participant E reflects a commitment to creating an inclusive learning environment by addressing technological and connectivity challenges that might hinder participation. Furthermore, as mentioned before the effects of scaffolding tasks is used as an effective means of dealing with issues related to digital literacy.

> *We still want to know what human beings think… therefore deepening engagement is essential as I want students to engage substantively with content, as when they are cognitively engaged there might be intellectual growth (Participant D, p. 7).*

The participant expresses a desire to delve into the thoughts of individuals, highlighting the continued importance of human insight despite technological advancements. This perspective aligns with a learner-centered approach that values the depth of engagement and the potential for cognitive development resulting from meaningful interactions with course materials.

> *'Online forum discussions have a phenomenal potential to engage students in their learning and the learning process. What I did was I made those count for marks, I required students to do preparatory reading, then they had to respond to a prompt and post their responses in the forum discussions. Students have to engage with the content, and they've got to commit to a response in preparation for a discussion, which then looks at the concept on a deeper level. However, they often must be marked bearing to encourage participation' (Participation C, p. 2).*

The mention of marks being tied to participation reflects an intentional effort to incentivize and recognize students' involvement in the online forum discussions. According to Zegowitz (2023), several research studies have demonstrated that when assessments are scheduled periodically and contribute to a small percentage of overall marks, they can enhance engagement with the learning material. This strategy suggests that to foster meaningful engagement and stimulate deeper understanding, it is important to tie external factors, such as assigning marks to activities.

In summary, the participants in the discussions about contemporary e-assessment values express diverse perspectives and principles guiding assessment practices. One participant emphasizes the importance of assessing authentic knowledge, highlighting its personalized nature beyond workplace knowledge. Another participant underscores the value of deepening engagement in

contemporary assessment, aiming to enhance learner interaction with course materials and encourage peer engagement. The principle of inclusivity is recognized as crucial to address accessibility barriers. Furthermore, there is an acknowledgment of the ongoing importance of understanding human perspectives, even in the face of technological advancements.

CONCLUSION

In conclusion, the exploration of contemporary e-assessment values has unveiled various perspectives and principles guiding assessment practices. Participants' discussions revealed varying views on the distinction between contemporary e-assessment and traditional assessment methods, with some initially resistant but ultimately recognizing its potential for diverse and creative assessment approaches.

The value of assessing authentic knowledge emerged as a cornerstone principle. Participants emphasized the importance of assessments that transcend mere memorization, focusing instead on students' capacity to apply knowledge authentically in real-world contexts. This resonates with the broader goal of preparing students for a future characterized by dynamic demands and technological advancements, underscoring the necessity for collaborative efforts among stakeholders to ensure students are equipped with relevant skills. Additionally, deepening engagement emerged as a pivotal value in contemporary assessment. Participants stressed the significance of assessments that not only enhance learner engagement with course content but also foster interaction and collaboration among peers. This includes considerations for inclusivity to address challenges such as the digital divide, ensuring equitable access to educational opportunities for all students.

The next chapter, summarized the findings of chapter four in relation to the literature and through the lenses of Sadler’s theoretical framework to form principles according to the findings of the study, hence, it answers the research question.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. SUMMARY OF FINDINGS

The examination of findings through the lens of Sadler's (1989) formative assessment framework revealed several key aspects. These include. The framework provided a valuable perspective using the following key aspects: making qualitative judgements, assessment as multidimensional and divergent, authentic assessment, inclusive assessment, and affordances of e-assessment. These aspects assisted in building an understanding and interpreting the results, shedding light on crucial dimensions that contribute to the effectiveness and challenges of formative assessment in the context of this study.

Findings 1: The Principle of Making a Qualitative Judgement

In Sadler's (1989) view, providing a qualitative judgment necessitates the educator to have expertise and understanding of the criteria for quality, along with the skill to make students cognizant of these standards. The data revealed multiple scenarios of alignment to Sadler's concept of qualitative judgement, for example, Participant C asserted that:

> *'Your e-assessment has to be clear, and you have to indicate to students exactly what your expectations are, and work through the rubric so that students may understand where the marks are coming from' (Participant C, p. 11).*

This aligns with the goal of equipping students to exercise professional judgment in their responses to assessments (Sadler, 1989). In addition, alignment was found in terms of the principles of e-assessment by De Villiers et al. (2016), principle of articulation and accreditation, students should be informed about the standards against which they will be judged and clearly understand the requirements of assessment through dialogue. As a student, I personally find great value in using a rubric or understanding the criteria for quality, as it helps me understand the expectations for a given task. It enables me to align my thought process with the qualities expected in a particular task or assessment. It also includes that learners should be aware of the learning outcomes and working towards it in order to make a quality judgement before submitting assignments (Sadler, 1989).

This method, according to Sadler (1989) prioritizes originality over the conventional notion of a strictly correct or incorrect answer by incorporating a more flexible criteria, permitting deviation based on the lecturer's professional judgment. Arguably, flexibility in this context extends to the consideration of external factors, particularly loadshedding, emphasizes the need for a qualitative judgment in setting assessment times. This resonates with Sadler's (1989) assertion that qualitative judgments, rather than rigid criteria, are necessary for assessing divergent student responses.

> *'In South Africa, problems like loadshedding plays a crucial role in how contemporary e-assessments are timed, I wouldn't give an exam that was timed a timed e-assessment that had to be done in a space of time because somebody somewhere is going to be affected by it' (Participant A, p. 7).*

Considering such external factors, it is important for lecturers to possess professional expertise to make decisions that may impact the validity of assessments. Therefore, the principle of making a quality judgement in assessment is essential. This is particularly dependent on the professionalism of lecturers and their experiences. For example, Participant C's proactive approach to factor in challenges, design assessments with complexity tailored to the student cohort, and emphasize the importance of knowing the students aligns with the importance of giving quality feedback, and adequately preparing students for assessments so that students would be able to make qualitative judgements in their responses to assessment (Sadler, 1989; Walton & Martin, 2023).

Consequently, Sadler (1989) advocates that there is no autonomous mechanism for delivering judgments, as grades are assigned following the assessment of the judgment (Sadler, 1989). However, the educator is required to have expertise and a comprehensive grasp of the criteria that define quality, and these criteria should be communicated to students beforehand (Sadler, 1989). This ensures a balance in the power dynamic displayed in assessment, whilst highlighting that the importance of making quality judgments is dependent on sharing the expectations of quality with students in advance to mitigate challenges that may arise. Pariticipant A (p. 4) made an interesting statement aligned to the autonomy of assessment:

> *'I think underestimate the power dynamics in assessment. There's a lot of power vested in assessment, in terms of where you decide if people are going to get their degrees or not, if they're going to pass the course or not, students are often very powerless in their progress'.*

As an example, by linking this statement to a scenario where a learner is unable to complete a section of a task due to issues such as network problems or load shedding, and the student provides

this as an explanation. It would require a lecturer who not only possesses the ability to make a quality judgment but also understands the student cohort and their challenges to make an informed judgment before assigning a grade. Therefore, the findings are aligned with Sadler's theoretical view, particularly in the context of the principle of making quality judgments, especially in a South African context. Consequently, the study suggests that in line with Sadler's (1989) theory, qualitative judgments are a recommended principle of contemporary e-assessment in that it could potentially balance the power dynamics of assessment.

Finding 2: The Principle of Authentic Assessment

According to De Villiers et al. (2016), the principle of authenticity, e-assessment should be authentic in that it should include real world experiences. One of the characteristics of making qualitative judgments, requires assessment to be original (Sadler, 1989). The data according to the sub-theme of "Assessing Authentic Knowledge" reveals a shared value among participants regarding the importance of authentic assessment in contemporary e-assessment practices. Participants emphasize the need for assessments to be meaningful, reflective of genuine understanding, and supportive of student growth. In the contemporary e-assessment theme, participants raised their challenges regarding the use of AI, particularly ChatGPT, in generating academic essays. It was found that assessing personal knowledge or rather authentic knowledge could potentially mitigate the challenges associated with cheating of this kind. Participant C's apprehension about AI-generated responses, especially in academic writing, aligns with Sadler's (1989) argument that assessments should stimulate critical thinking and analytical reasoning, aspects that might be compromised by reliance on AI-generated content.

> *'I think that the testing of authentic knowledge has something to do with the person. It's not about testing generic knowledge that can be produced by machine or by any other person and it will be the same, for me authentic knowledge relates to the person's process of learning.' (participant C, p. 4)*

The recognition that AI may struggle to assess reflective and experiential components of learning echoes Sadler's (1989) argument that assessments should focus on fostering high order thinking skills. Furthermore, Participant A's assertion of alternative e-assessment formats, such as podcasts and teacher portfolios, aligns with Sadler's emphasis on assessments that capture the original dimensions of student learning. Furthermore, Sadler's (1989) theory aligns to Participant C's belief

in linking assessments to real-life scenarios and problem-solving, with an emphasis on relevance and meaningfulness, supports the idea that authentic assessment should go beyond traditional evaluation methods and promote higher order thinking skills (Sadler, 1989). It also focuses on the aspect of multidimensionality and diverse forms assessments needed to foster effective assessments (Sadler, 1989).

Finding 3: The Principle of Divergence and Multidimensionality of Assessment

Sadler (1989) rejects the notion of simplistic and sequential model of learning in favour of a more holistic understanding of assessment due to his multidimensional view of assessment. Sadler (1989) further asserts that the concept of divergence implies the diverse paths that students could take when producing assessments (Walton & Martin, 2023). The data showed that participants shared this view, specifically in terms of having assessment scaffolded. For Sadler (1989), scaffolding requires a wide range of tasks to achieve the end goal of assessment in a holistic approach to assessment, for example from formative to summative assessment.

> *Participant B: 'You can give students experience of different platforms by setting short assessment tasks and various assessments.'*

Scaffolding aligns with enhancing students' ability to judge the quality of what they are producing, thus, regulating what they are doing (Sadler, 1989). Ultimately, this principle implies that learners will take different paths in responding to an assessment as they engage with the material differently (Sadler, 1989). In my capacity as an educator, I've observed students generating distinct responses to a shared assignment. This diversity in their submissions indicates that each student approaches the assignment uniquely, reflecting their individual perspectives, creativity, and comprehension of the task. The aspect of assessment as multidimensional and diverse provides opportunity for students to show their learning, and with the immediate feedback aspect of e-assessment, learners can regulate their learning, whilst familiarizing themselves with different forms of assessment as asserted by Participant A.

> *'I think the lecturer and student familiarity with technology is important. They should be scaffolding stuff, for example, when you are using different E-tools scaffolding stuff can assist in creating familiarity and minimize cheating' (Participant A, p. 7).*

Scaffolding, therefore, emerges as a valuable strategy to create a more equitable e-assessment environment, ensuring that all students, regardless of their language background or digital literacy, can engage effectively with the assessment process. This coincides with the wider principle that assessment is multidimensional, continuous and divers forms of assessments are required (Sadler, 1989). Consequently, De Villiers et al.'s (2016) principle of adaptation states that employing multi-dimensional assessment approaches that offer diverse opportunities for students to showcase their competencies, and skills enriches their learning experience. Therefore, the study adopts the principle of multidimensional and divergence as a key principle of e-assessment.

Finding 4: The Principle of Inclusivity

The inclusivity principle is positioned as designing assessment that is fair and unbiased. This finding encapsulates the remaining data under the overarching theme of inclusivity within a South African context, viewed through the lens of Sadler's (1989) theory of formative assessment. The principle of inclusivity is mentioned by Participant E, to address challenges related to the digital divide, such as load shedding and connectivity issues. This principle is essential as it asserts that no student should be left behind in the learning process.

> *'To enable participation, inclusivity was a big principle for me. For example, it was online but we zero rated the site, we made every single module data light and data bundles were provided for the students.' (participant E)*

Inclusivity asserts that when designing e-assessments lecturers should take into consideration that all students must have access to completing the assessment equally. Hence, if there are hinderances in the form of access, then data or devices should be provided or made accessible to students (Malatji & Baloyi, 2023). Furthermore, to ensure that e-assessments are inclusive, lecturers have to consider the barriers to language that may occur or cause confusion. In other words, any possibility in terms of digital literacy and language barriers that may cause confusion should be planned for.

> *Participant A (p. 5), 'I think in being accessible to the whole range of different people that are in my class scaffolding plays an important role off providing multiple access points. As you represent one question and it's not going to be linguistically accessible for everybody, that is why there should be multiple scaffolding points to help accessibility and that also*

> *helps fairness as it needs to explore the knowledge in the course in a kind of deep and dynamic way how.'*

In the research data scaffolding emerged as a key concept to mitigating challenges of language barriers and digital literacy as well. Participant A, highlighted the role of scaffolding in providing multiple access points, making assessments linguistically accessible for a diverse range of students. This aligns with the principle of inclusivity, acknowledging the diversity among learners and ensuring that assessments accommodate various learning needs. The emphasis on exploring knowledge in a deep and dynamic way reflects a commitment to cognitive engagement and a nuanced understanding of course content. Furthermore, providing data bundles as stated by Participant E, and creating a backup hard copy resource demonstrates a proactive effort to overcome technological barriers and ensure that all students can participate effectively. This approach aligns with the goal of inclusivity in contemporary e-assessment. The finding contends that adopting a scaffolding approach in e-assessments not only facilitates fairness but also mitigates biases particularly when students grapple with technological literacy or encounter challenges in grasping key concepts (Sadler, 1989).

Finding 5: The Principle of Affordances

In the design of e-assessments, it is crucial to consider the affordances of e-assessment, specifically in a contemporary e-landscape. De Villiers et al. (2016) highlighted that the principle of affordances encompasses factors such as the flexibility in content delivery, the provision of immediate feedback, and the capability to enhance engagement. The study reveals a fundamental value—assessment designed to enhance the student learning experience. Quality feedback, as emphasized by Sadler (1989), plays a pivotal role in this process, enabling students to address areas of concern and improve their understanding. In the data, participants highlighted the affordances of e-assessment when designing their e-assessments. An affordance that stood out he most was the advantage of immediate feedback especially when teaching large student cohorts of more than 400 students.

> '*Immediate feedback makes one aware of student characteristics, if there is a problem or if students haven't mastered certain concepts or skills then you can address it immediately in the course by supplementing it in one way or another whether it be in adding to the online readings or unpacking it in the tutorial session. This actually gives you the*

> *opportunity to actually analyze students as ability to apply what they've learned,' (Participant C, p. 10).*

Walton and Martin (2023) in their application of the Sadler theoretical framework, advocated for assessments that actively foster engagement, proposing the integration of discussion forums as a scaffold to facilitate meaningful interactions between students and instructors. This interactive approach, contrasting with a monologic presentation by students, contributes to an enriched understanding (Walton & Martin, 2023). The finding posits that, to embody the principle of affordance, the design of e-assessments should prioritize the provision of immediate feedback to promptly address misconceptions early in the course. Aligning with Sadler's theory, these assessments must also be structured to amplify learner engagement and foster the potential for self-regulation among students.

5.1.1 RESPONDING TO THE RESEARCH QUESTION

In response to the research question, *how can the current assessment principles be deepened (expanded on) to incorporate contemporary e-assessment practices that can enhance effective e-assessment designs?*

Addressing the inquiry of how existing assessment principles can be enriched to integrate modern e-assessment practices for enhanced designs, the study recommends considering the following principles based on the study's findings. Consequently, the study revisits SAQA's principles with the aim of proposing an option for their expansion and deepening.

- **Valid:** Assessment is valid when it measures that which it sets out to measure. The study found that participants viewed the principle of validity as essential to designing their e-assessments. Therefore, the finding did not show any data related to expanding of deepening the principle of validity.
- **Reliability:** The principle of quality judgment opposes the principle of reliability, which asserts that dependable assessment produces consistent results under similar conditions. The data findings suggest that designing contemporary e-assessments has the potential to challenge the principle of reliability, given that students are diverse, and their thinking processes vary, leading to differences in their responses to assessments. In cases where assessments go beyond seeking correct or incorrect answers and require deeper engagement and personal knowledge,

the findings indicate that the principle of quality judgment would be preferable in contemporary e-assessment (Sadler, 1989). This approach equips lecturers to exercise professional judgment in grading assessments as the criteria would not be as rigid, allowing for an assessment based on students' experiences and responses (Sadler, 1989). Sadler (1989) asserts that there are cases in assessment where validity will take precedence over reliability, hence, the findings suggest that when designing contemporary e-assessments validity takes precedence over reliability depending on the nature of the task. For example, in cases where assessments aim to measure complex or divergent responses, such as in creative tasks or problem-solving exercises, validity becomes more important (Sadler, 1989). On the other hand, in assessments where consistent and comparable results are crucial, such as in standardized tests or assessments with clear-cut answers, reliability takes precedence. In these cases, it is essential to maintain consistent grading standards to ensure fairness and comparability across all assessments.

- **Integrity***:* Maintaining honesty in the assessment process is crucial for upholding academic integrity and preventing academic misconduct. The data has revealed that traditional academic essays face a potential integrity risk due to the capability of ChatGPT to generate well-crafted essays in response to prompts. Hence, the principle of integrity becomes even more crucial in contemporary times. Measures to ensure integrity should be implemented, and according to the findings of the study, the principle of authenticity is deemed essential for designing effective e-assessments. Although the term authenticity is still debatable amongst academics, the findings of the study show a shared value among participants regarding the importance of authentic assessment in contemporary e-assessment practices. Participants emphasizes the need for assessments to be meaningful, reflective of genuine understanding, and supportive of student growth. Therefore, the principle can be deepened by including the need for authentic e-assessments to mitigate the challenges of academic misconduct.
- **Transparent***:* Learners and lecturers must possess a clear understanding of the assessment processes, and transparency in assessment, categorized as qualitative judgment, plays a crucial role. The data suggests that for learners to make a qualitative judgment in their assessment responses, they need awareness of what quality entails. Consequently, it is recommended that academics collaboratively navigate the rubric or criteria defining quality before assessing students.

- **The Inclusivity Principle** aligns with SAQA's **Fairness** principle, ensuring that learners are assessed based on their knowledge and instruction, avoiding **bias** that could advantage or disadvantage specific learners or groups. It also emphasizes **language sensitivity** to prevent variations in learning. And lastly, the inclusivity principle includes the principle of credibility in terms of the physical and environmental conditions during assessment activities and outcomes are unbiased and do not unfairly influence the credibility of the assessment. For example, the impact of loadshedding had the potential to impact the environmental conditions of assessment negatively. The principle of inclusivity advocates for fairness in e-assessment, considering students' digital literacy, avoiding bias that could favor those with more technical experience on a specific platform or tool and it further asserts that external factors such as load shedding should be considered when designing e-assessments. Furthermore, it highlights the importance of language consideration in task design to prevent potential misconceptions. The concept of scaffolding is identified as crucial for addressing challenges related to fairness, bias, and language. Therefore, the study proposes using the term "inclusivity" as it encompasses these three SAQA principles (fair, bias, sensitivity to language), providing a comprehensive approach to addressing them collectively.
- **Assessment is multidimensional and diverse:** Based on the findings, the study suggests the addition of the principle of multidimensional assessments to encourage diverse forms of assessment. This would promote e-assessment as an ongoing, continuous process, taking various paths to achieve its goals. Moreover, it has the potential to address power dynamics in assessment by incorporating students' voices and personal experiences into the assessment process. For example, e-assessments can be more diverse and multidimensional by including different types of tasks, such as projects, presentations, and simulations, which allow students to show their knowledge and skills in various ways, thus making room for student voice and empowerment. Furthermore, the researcher suggests that incorporating the principle of affordance under the principle of multidimensional and diversification to encourage designing e-assessments that would display the affordances of e-assessment to engage learners in the assessment process.

5.2. RECOMMENDATIONS FOR THE FUTURE

For future research in e-assessment, it is recommended to further explore the specific challenges and opportunities linked to integrating AI and machine learning into assessment practices. Technology continues to advance, thus, understanding the implications of automated essay generation, chatbots, or other AI-driven assessment tools on the principles of validity, reliability, and integrity becomes crucial. Additionally, exploring innovative ways to enhance engagement in e-assessment, such as gamification or immersive technologies, could provide valuable insights. Investigating the impact of cultural diversity on assessment practices and how to ensure inclusivity in a global context is another promising avenue. Furthermore, longitudinal studies tracking the effectiveness and evolution of contemporary e-assessment practices over time would contribute to the ongoing development of comprehensive assessment frameworks. Finally, examining the role of lecturers in adapting and embracing emerging e-assessment technologies and pedagogies, along with their professional development needs, would be beneficial for fostering effective implementation in educational settings.

5.3. IMPLICATIONS FOR PRACTICE

The implications of the study for practice in contemporary e-assessment are substantial. Firstly, lecturers and institutions should consider revisiting and expanding existing assessment principles, such as those outlined by SAQA, to align more closely with the dynamics of e-assessment. The principles of validity, reliability, and integrity should be reevaluated considering diverse student populations and the potential impact of technological advancements like AI. The incorporation of the principle of quality judgment, as suggested by Sadler, becomes crucial, emphasizing the need for lecturers to exercise professional judgment in grading assessments that go beyond traditional correct/incorrect answers. Additionally, the concept of inclusivity emerges as a key guiding principle, urging lecturers to design e-assessments that are fair, unbiased, and considerate of diverse learning contexts, including issues like digital literacy and external challenges such as load shedding. The multidimensional nature of e-assessment, encompassing various forms and paths, should be acknowledged, and encouraged for a comprehensive and continuous assessment approach. Lastly, lecturers are encouraged to explore emerging technologies and pedagogies,

embracing innovative tools and methodologies to enhance engagement and address the evolving landscape of e-assessment.

5.4. CONCLUSION

In conclusion, this study explored lecturers' e-assessment practices and values, aiming to deepen the established assessment principles by SAQA (2014), to accommodate contemporary e-assessment practices. The researcher employed a naturalist paradigm, aligned to qualitative research design to answer the research question. The study focused on discerning the perspectives and values related to e-assessment held by lecturers in a South African university. The research involved online interviews with five participants, and the subsequent transcriptions were cross verified by the lecturers for accuracy. Thematic analysis, guided by Sadler's theoretical framework for formative assessment was applied to scrutinize the data. The seamlessly identified themes in the study resonated with the existing literature, facilitating a coherent alignment with Sadler's (1989) theoretical framework. This alignment streamlined the process of interpreting the study's findings through the lens of five distinct e-assessment principles.

The findings underscore the importance of revisiting established principles and adapting them to the specific challenges and opportunities posed by e-assessment, hence, it presented the potential to answer the research question accurately in the context of this study. The integration of Sadler's (1989) formative assessment framework proved to be a suitable framework for this study, as the lenses it provided in analyzing the data proved to be effective in the e-landscape. Sadler's (1989) principle of quality judgment becomes paramount, allowing lecturers to exercise professional judgment in grading assessments that require deeper engagement and personal knowledge. The principle of inclusivity emerged from the data as a cornerstone, emphasizing fairness, avoidance of bias, and sensitivity to diverse learning contexts, including technological disparities and external challenges. This is done under the concept of scaffolding tasks to mitigate the challenges of unfair and bias assessment. The proposed addition of a multidimensional assessment principle encourages a more flexible and continuous approach to evaluation. In practical terms, lecturers are urged to explore innovative tools and pedagogies to enhance engagement and adapt to the evolving landscape of e-assessment. This study contributes valuable insights for practitioners navigating the complexities of contemporary e-assessment, offering a roadmap for future research and practice in this ever-evolving field.

6. APPENDICES

6.1. APPENDIX A- ETHICS APPROVAL

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG | WSoE Wits School of Education

SCHOOL OF EDUCATION ETHICS COMMITTEE

CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: 2023ECE004**
PROJECT TITLE	Examining the underlying principles of e-Assessment in Higher Education
INVESTIGATOR	**ABRAHAMS YULENE RULENE**
SCHOOL/DEPARTMENT OF INVESTIGATOR	Wits School of Education
DATE CONSIDERED	06-Mar-23
DECISION OF THE COMMITTEE	Approved unconditionally
RISK LEVEL	Minimal risk
EXPIRY DATE	Date of submission of the Research Report
ISSUE DATE OF CERTIFICATE	20-Mar-23
CHAIRPERSON	Dr. Batseba Mofolo-Mbokane

cc: Dr Piet Bothma and Fatima Makda

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Signature _____ **Date** 03/30/2023

27 St Andrews Road, Parktown, Johannesburg, 2193 | Put Bag 3, WITS, 2050 | T: +27 11 717 3007 | www.wits.ac.za/education

6.2. APPENDIX B- ETHICS APPLICATION FORM

University of the Witwatersrand, Johannesburg

Ethics Application Form* for *Human Research Ethics Committee (HREC Non-Medical)
(SCHOOL ETHICS COMMITTEES: Revised January 2021)

Instructions

1. This form must be completed by Honours (4th year) and Masters by Coursework and Research Report students who require ethics clearance, or for ethics clearance for coursework activities as part of a taught degree. Note that staff non-degree applications, PhD and research Masters students must complete the online form.
2. Completed applications must be submitted to the relevant School Ethics Committee.
3. Applications may be submitted as hard or soft (electronic) copies, but the first page of the application must contain the signatures of the student and supervisor. Final revised versions must be in soft (electronic) copy as all documentation will be archived.
4. Incomplete or handwritten applications will **NOT** be considered, including where signatures are missing.
5. Necessary supporting documents (e.g. *Participant Information Sheet, Consent Form*, copies of instruments, permission letters, etc), must be provided.

SECTION A

Complete this checklist to show what documents you have submitted and that you agree with the conditions of application.

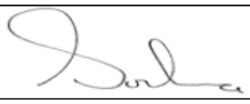
X	Completed ***Ethics Application Form***.
X	Copy of the ***Research proposal.***
X	Copy of proposed ***Research instruments*** (e.g. questionnaires/interview schedules).
X	***Participant Information Sheets*** (for each different sample group and/or instrument used).
X	***Consent forms*** (for each different sample group and/or instrument used).
X	***Relevant permission letters*** if required (from, e.g. company's HR department, National authorities such as Government departments, etc.) - consult the ***Guidance on the Use of Permission Letters*** document.

SIGNATURES (REQUIRED)

Declaration: We, the signatories, declare that all information on this form is correct and that we will strive to maintain the highest ethical standards in this research at all times, according to disciplinary and university

I recognise that it is my responsibility to conduct my research in an ethical manner according to Guidelines of the University of the Witwatersrand, according to any laws and/or legal frameworks that may apply, and according to the norms and expectations of my discipline. In preparing this Application for Ethics Clearance form, I have consulted the ***Guidelines for Human Research Ethics Clearance Application/Non-Medical*** (available on this website https://www.wits.ac.za/research/researcher-support/research-ethics/ethics-committees/). In receiving ethics clearance, I agree to abide by the conditions of data collection as outlined in the *Guidelines* document.	X Yes	No

By signing this form, the researcher and supervisor of this project undertake to ensure that any amendments to this project that are required by the Human Research Ethics Committee (Non-Medical) and School Ethics Committees are made before the project commences.

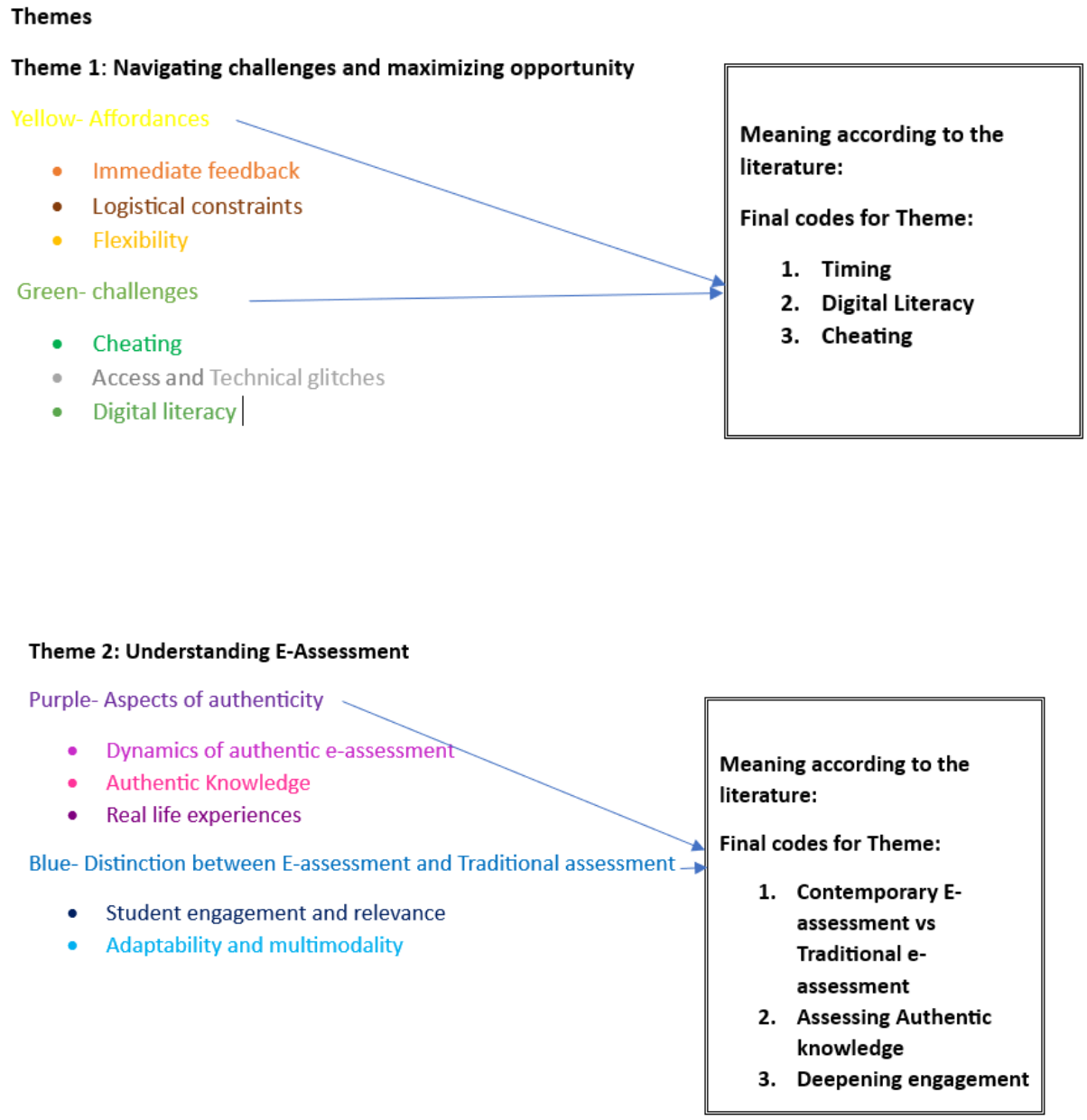
	Date	Name	Signature*
Applicant	15 February 2023	Yulene Rulene Abrahams	
Supervisor	18 February 2023	P H Bothma	

6.3. APPENDIX C- SAMPLES OF INTERVIEW EXTRACTS

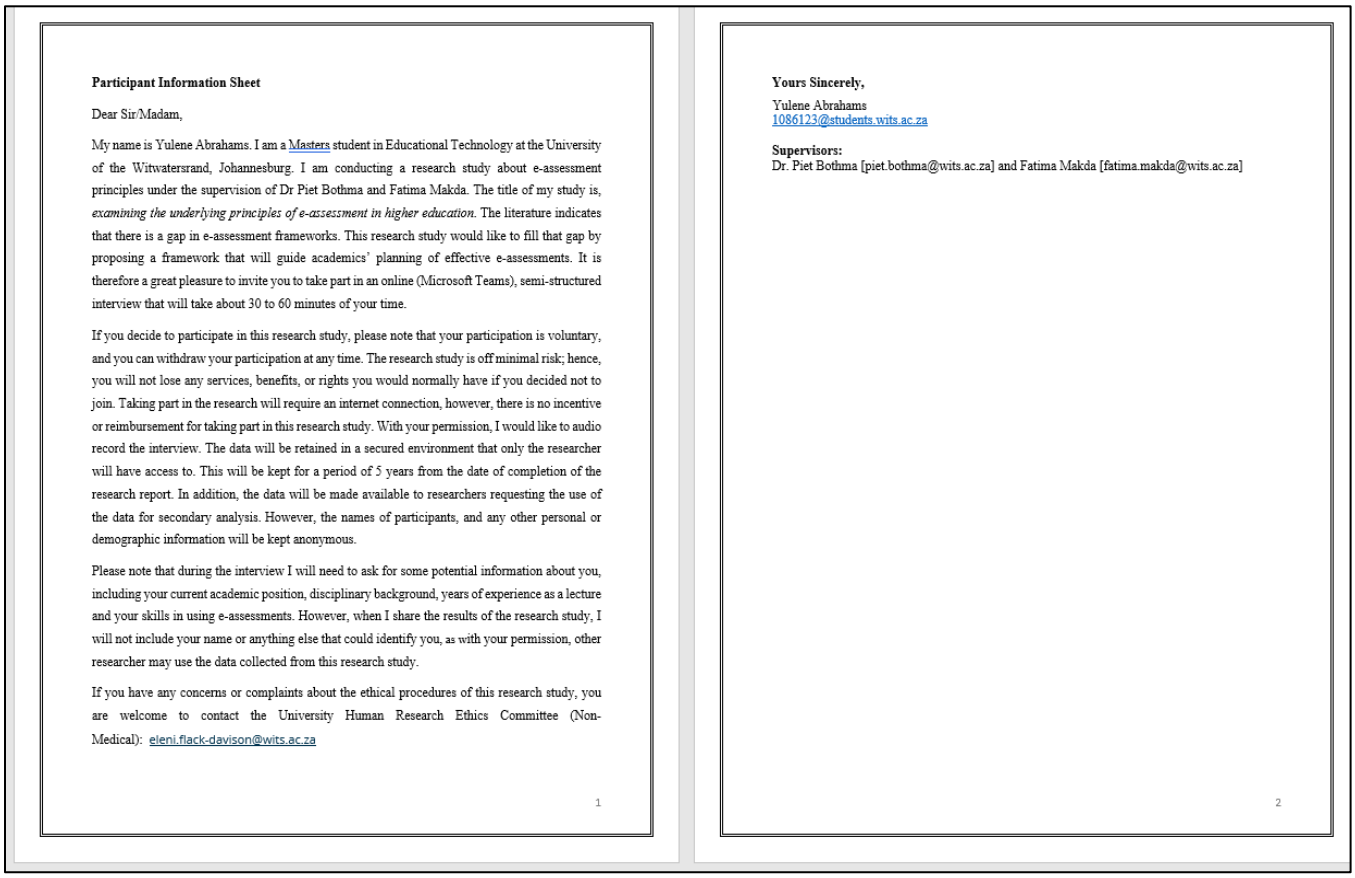
PARTICIPANT: No, exactly. I think it's invaluable because the point, I think that people approach assessment differently. I think that we kind of underestimate the power dynamics in assessment. And there's really like a lot of power vested in assessment in terms of like that's where you decide if people are going to get their degrees or not, if they're going to pass the course or not. Students are often very powerless in that progress. And that's where I really like the authentic assessment, which can be overlaid onto e-assessment. Now I've forgotten the point that I was going to… so I think that some people approach assessment from the position that like students must know everything of their course. And if, and the exam is supposed to, it's supposed to kind of almost tried to catch them out. And I think that that's very unhelpful because for me it doesn't really test knowledge, it tests cramming. Whereas, if students have a longer time to work with what concepts they're going to use, what things they're going to bring in, they have choices that they make around it, they're deciding what was important for them in the course and then think around the question that you're testing a much more authentic form of knowledge rather than just like what knowledge can be absorbed and regurgitated. So, I think that it's helpful if you're doing assessment in that way where you're trying to get a genuine sense of what the students have understood by a certain thing or from a course, that there are check-ins on the way.

PARTICIPANT: These are principles again, that I picked up during COVID that was kind of working against cheating in a more general way, but also trying to test the knowledge that is authentic. And I built in quite a lot of reflections in my take home exams. So even for the podcast, there's an oral podcast that's submitted, but there's also a written reflection on what was the podcast process like, what was difficult, what was exciting, and what was kind of learnt from the process. So, I think that, and I've built that in different kinds of take-home online exams in different ways. My exam In June was asking students to build their own teaching portfolio that required them to reflect on what they had learned in class and how they took those concepts to put them into their portfolio. So that is quite difficult to pull from chatGPT because I got a lot of personal knowledge. So, I think if we're thinking about and look I'm in the school of education so it works thinking about that meta process of learning is really useful in the school of education because thinking about learning is useful. And I think that we should all do that. It might work differently in different subjects, but I think that the testing and authentic knowledge has something to do with the person as well. And has something, it's not about testing generic knowledge that can be produced by a machine, by anybody at any point, and it'll be the same. I don't know how people who teach subjects like maths are going to manage because that's a whole different thing. But for me, testing and authentic knowledge relates to the person's process of learning, as well as to link the process of learning to what they have learned, and to explain those two in an interconnected way. And I think that that's where

6.4. APPENDIX D: SAMPLE OF CODES



6.5. APPENDIX E: PARTICIPANT INFORMATION SHEET



Participant Information Sheet

Dear Sir/Madam,

My name is Yulene Abrahams. I am a Masters student in Educational Technology at the University of the Witwatersrand, Johannesburg. I am conducting a research study about e-assessment principles under the supervision of Dr Piet Bothma and Fatima Makda. The title of my study is, *examining the underlying principles of e-assessment in higher education*. The literature indicates that there is a gap in e-assessment frameworks. This research study would like to fill that gap by proposing a framework that will guide academics' planning of effective e-assessments. It is therefore a great pleasure to invite you to take part in an online (Microsoft Teams), semi-structured interview that will take about 30 to 60 minutes of your time.

If you decide to participate in this research study, please note that your participation is voluntary, and you can withdraw your participation at any time. The research study is off minimal risk; hence, you will not lose any services, benefits, or rights you would normally have if you decided not to join. Taking part in the research will require an internet connection, however, there is no incentive or reimbursement for taking part in this research study. With your permission, I would like to audio record the interview. The data will be retained in a secured environment that only the researcher will have access to. This will be kept for a period of 5 years from the date of completion of the research report. In addition, the data will be made available to researchers requesting the use of the data for secondary analysis. However, the names of participants, and any other personal or demographic information will be kept anonymous.

Please note that during the interview I will need to ask for some potential information about you, including your current academic position, disciplinary background, years of experience as a lecture and your skills in using e-assessments. However, when I share the results of the research study, I will not include your name or anything else that could identify you, as with your permission, other researcher may use the data collected from this research study.

If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical): eleni.flack-davison@wits.ac.za

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Yours Sincerely,

Yulene Abrahams
1086123@students.wits.ac.za

Supervisors:
Dr. Piet Bothma [piet.bothma@wits.ac.za] and Fatima Makda [fatima.makda@wits.ac.za]

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