The relevance of Bloom's Taxonomy for technologically aligned pedagogies in the South African Open Distance Learning environment

by

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DECLARATION

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DEDICATION

This mini-dissertation is dedicated to my wife, Vineshree, and my son, Callum.

To both of you, thank you for your patience over the countless long evenings and weekends spent researching, writing, and navigating the endless cycle of revisions on this mini-dissertation. This Master's degree may have my name on the certificate, but the achievement belongs to us as a family. We have walked this road together, and this success is a testament to our collective resilience and love.

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ABSTRACT

This mini-dissertation explores the continued relevance of Bloom's Taxonomy as a prominent pedagogical tool for South African Higher Education, specifically within the Open Distance Learning (ODL) environment. The transitioning of higher education institutions into more online or blended and hybrid modalities, brought about by the COVID-19 pandemic, made it necessary to look into the suitability of pedagogical tools that were widely in use at the time of the pandemic breakout.

Adopting an interpretivist paradigm, a document analysis of 362 HEQSF accredited qualifications on the SAQA public database, and a qualitative case study approach comprising semi-structured interviews with seven higher-education professionals, the study examined the perspectives of South African Higher Education professionals on their experiences using Bloom's Taxonomy as a fundamental element of qualification accreditation (using semi-structured interview and thematic analysis to identify underlying themes), to determine whether Bloom's Taxonomy is still relevant in the context of the 4th Industrial Revolution.

The findings revealed widely contrasting perspectives. It is acknowledged that Bloom's Taxonomy is diminishing in importance as a standalone pedagogical tool as the world shifts to a more online global learning experience shaped through social engagement. At the same time, the taxonomy is still seen as a fundamental requirement for qualification accreditation in the context of the South African regulatory environment. This is the case because the qualification design and approval process has largely been reduced to a mechanical, administrative, or procedural task rather than providing an opportunity for cognitive development, assessment, and content scaffolding, as was originally intended in the 1956 design of the taxonomy.

The mini-dissertation concludes by highlighting that, whilst Bloom's Taxonomy will continue to influence the South African Open Distance Learning environment, from a qualification accreditation perspective, its relevance can only be substantiated if it is merged with more contemporary frameworks to effectively support the digital competencies required in a technology-driven economy.

Key Terms: 4th Industrial Revolution, Bloom's Taxonomy, Curriculum Design, Digital Taxonomy, Enhanced Taxonomy, Exit Level Outcomes, Open Distance Learning (ODL), Qualification Accreditation, South African Higher Education, Technologically Aligned Pedagogies

OPSOMMING

Hierdie mini-verhandeling ondersoek die voortgesette toepaslikheid van Bloom se Taksonomie as ’n prominente pedagogiese hulpmiddel vir Suid-Afrikaanse Hoër Onderwys, spesifiek binne die omgewing van Oop Afstandsleer (OAL). Die oorgang van hoër onderwysinstellings na ‘n modaliteit grootliks gerugsteun deur ‘n aanlyn- en/of hybriede model, deur die COVID-19-pandemie teweeggebring, het die ondersoek na die geskiktheid van pedagogiese hulpmiddels wat algemeen gebruik is tydens die uitbreek van die pandemie, genoodsaak.

Die paradigma wat die studie ten grondslag lê is interpretivistiese navorsing. Vir die doel, is 362 HOKSR (HEQSF)-geakkrediteerde kwalifikasies op SAKO (SAQA) se openbare databasis ge-analiseer. Dit is ondersteun deur ‘n kwalitatiewe gevallestudie-benadering bestaande uit sewe semi-gestruktureerde onderhoude met hoër onderwys praktisyns. Die doel hiervan was om hulle perspektiewe deur middel van sekere temas te analiseer. Die onderhoude het dus gefokus op hulle ervarings met die gebruik van Bloom se Taksonomie as ’n fundamentele element van die akkrediitasie van kwalifikasies, ten einde vas te stel of Bloom se Taksonomie nog steeds relevant is binne die konteks van die 4de Industriële Revolusie.

Die bevindinge het wyd uiteenlopende perspektiewe aan die lig gebring. Daar word erken dat Bloom se Taksonomie besig is om af te neem in belangrikheid as ’n alleenstaande pedagogiese hulpmiddel namate die wêreld verskuif na ’n meer aanlyn globale leerervaring gevorm deur sosiale betrokkenheid. Terselfdertyd word die taksonomie steeds as ’n fundamentele vereiste vir die akkreditasie van kwalifikasies binne die konteks van die Suid-Afrikaanse regulatoriese omgewing beskou. Dit is die geval omdat die ontwerp- en goedkeuringsproses van kwalifikasies grootliks bestaan uit meganiese- en/of administratiewe take en prosedures, eerder dat ‘n geleentheid gebied word vir kognitiewe ontwikkeling, die steiering van inhoud en assessring soos oorspronklik bedoel was met die 1956-ontwerp van die taksonomie.

Die mini-verhandeling sluit af deur te beklemtoon dat, alhoewel Bloom se Taksonomie voortgaan om die Suid-Afrikaanse oop afstandsleer omgewing te beïnvloed vanuit die perspektief van die akkreditasie van kwalifikasies, die voortgesette toepaslikheid sal afhang van die samevoeging met kontemporêre raamwerke om die digitale vaardighede vereis deur ‘n tegnologie-gedrewe ekonomie, effektief te ondersteun.

Sleutelterme: 4de Industriële Revolusie, Bloom se Taksonomie, Kurrikulumontwerp, Digitale Taksonomie, Verbeterde Taksonomie, Uittreevlak-uitkomste, Oop Afstandsleer (OAL), Kwalifikasie-akkreditasie, Suid-Afrikaanse Hoër Onderwys, Tegnologies-belynde Pedagogieë

ABSTRAK

Mini-disertšene ye e lekola go tšwela pele ga bohlokwa bja Taksonomi ya Bloom bjalo ka sedirišwa se segolo sa pedagogi Thutong e Phagameng ya Afrika Borwa, kudu ka gare ga maemo a Thuto ya Kgojana. Go fetogela ga diinstitušene tša thuto ye e phagameng go ya mekgweng ya inthanete fela, goba mekgweng ye e hlakantšhitjwego le inthanete, ye e hlohleleditšwego ke leuba la COVID-19, e dirile gore go be bohlokwa go lekola maleba a didirišwa tša pedagogi tšeo di bego di dirišwa kudu nakong ya go phatlalala ga leuba leo.

Ka go dira mokgwa wa thuto wa interpretivist, tshekatsheko ya ditokomane tša 362 dithuto tše di dumellegileng ke HEQSF godimo ga polokelo ya setšhaba ya SAQA, le mokgwa wa nyakišišo ya tlhokomelo ye e akareditšego dipoledišano tše di hlophišitšwego le baporofetšonale ba šupa ba thuto e phagameng, nyakišišo ye e hlahlobile maikutlo a baporofetšonale ba Thuto e Phagameng ya Afrika Borwa godimo ga boitemogelo bofela bja bona ka go diriša Taksonomi ya Bloom bjalo ka karolo ya motheo ya netefatšo ya dithuto (ka go diriša dipoledišano tše di sa hlophišitšwego le tshekatsheko ya mookotaba go hlaola mehlametlo ye e tšwelelago), go bona ge eba Taksonomi ya Bloom e sa na le bohlokwa ka gare ga maemo a tšwelopele ya indasteri ya bone.

Diphihlelelo di bontšhitše maikutlo a go fapana kudu. Go lemogilwe gore bohlokwa bja Taksonomi ya Bloom bo a fokotšega bjwalo ka sedirišwa sa pedagogi seo se ikemetseng, ka ge lefase le fetogela boitemogelo bja thuto ya inthanete lefase ka bophara, bjo bo hlohleleditšwego ke go nkgopola ga leago. Le ge go le bjwalo, taksonomi ye e sa tšewa bjalo ka senyakwa sa motheo sa netefatšo ya dithuto ka gare ga melao ya thuto ya Afrika Borwa. Se ke ka gore prošeše ya thlamo le go dumella dithuto e feditšwe go dira wa mešomo ya botseta, taolo le tsamaiso, go na le go fa monyetla wa kago ya monagano, tlhahlobo le thekgo ya diteng, bjalo ka ge go rerilwe khatisong ya 1956 ya taksonomi ye.

Mini-disertšene ye e phetha ka go gatelela gore, le ge Taksonomi ya Bloom e tlo tšwela pele go ama maemo a Thuto ya Kgojana a Afrika Borwa, go tšwa lehlakoreng la netefatšo ya dithuto, bohlokwa bja yona bo ka netefatšwa fela ge e kopanywa le ditlhaka tša pedagogi tše di sa tsofelago, go thekga ka maleba bokgoni bja dijithale bjo bo nyakegago ikonoming e laolwago ke theknoloji.

Mareo a Bohlokwa: Tšwelopele ya Indasteri ya bone, Taksonomi ya Bloom, Tlhamo ya Kharikulumi, Taksonomi ya Dijithale, Taksonomi e Kaonafaditšwego, Dipoelo tša Boemo bja Go Tšwa, Thuto ya Kgojana, Netefatšo ya Dithuto, Thuto e Phagameng ya Afrika Borwa, Mekgwa ya Pedagogi a Sepelelago le Theknoloji.

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ORIENTATION AND BACKGROUND

1.1. INTRODUCTION AND RATIONALE

This mini-dissertation has been completed as part of the University of South Africa's Master of Education in Open Distance Learning, (Qualification Type: Coursework | Qualification Code: 98999 | SAQA ID: 101245). It offers a limited scope of research within the context of Open Distance Learning in the South African landscape.

With over five years of experience in the design of higher education qualifications, and having been a member of the 2024/2025 Council on Higher Education Community of Practice for the development of the new Higher Education Practice Standards (HEPS), focusing specifically on 'Transitions through Higher Education', the researcher for this study has a strong connection and interest in how the fundamental constructs of qualification design brings standardisation to the higher education sector. The standardisation of learning outcome design will ultimately aid in a student's learning journey and their ability to articulate between institutions of higher learning.

The South African Department of Higher Education and Training (DHET) has acknowledged the importance of distance education provision to "(1) Open access to post-schooling education opportunities … and (2) Lower costs per student by amortising curriculum design …" (South African Department of Higher Education and Training, 2014:6). Therefore, when exploring the question of the efficacy of a digital taxonomy, the scope of the study will be restricted to the Open Distance Learning environment. It is in this context that social-constructivist approaches are used to reduce the effects of transactional distance, and connectivism approaches leverage learner management systems to encourage engagement with online networks for knowledge creation. For this research, 'Open Distance Learning' is understood according to the reference provided by the DHET Policy for the Provision of Distance Education in South African Universities in the Context of an Integrated Post-School System.

The DHET indicates that "Open Distance Learning implies that ALL distance programmes offered are based on open learning principles" (South African Department of Higher Education and Training, 2014:20). This offers a comprehensive approach to curriculum design, regardless of whether the qualifications are being designed for public or private higher education institutions, or the degree to which online technologies are utilised.

1.2. THEORETICAL AND REGULATORY LANDSCAPE

The pedagogical approach to the design, development, delivery, and assessment of Higher Education qualifications is closely aligned with the predominant learning theories of the time. These two fields evolve together in a synchronised manner as new theories and philosophies are accepted into the mainstream fields of psychology and education. The early psychological learning theories of behaviourism and cognitivism aided in shaping the approach of most traditional contact-learning institutions. As the benefits of working together collaboratively to acquire knowledge in the 4th Industrial Revolution have become more pronounced, the pedagogical theories of social collaborativism and connectivism are at the forefront of online, distance learning (Adefila & Pillay, 2019).

Within the South African regulatory landscape of the Council on Higher Education (CHE) and the South African Qualifications Authority (SAQA), the accreditation of new qualifications has been strongly associated with the cognitivist approach. This approach utilises Bloom's Taxonomy to ensure that learning outcomes (and assessment criteria) are aligned to the correct National Qualification Framework (NQF) level of programmes as well as modules. Bloom's taxonomy is a widely accepted framework used to formulate learning outcomes and assessment criteria according to increasingly complex and specific levels of cognitive development (Ajayi, 2024:1). The acceptance of the original Bloom's Taxonomy, and the revised version of 2001, has influenced curriculum design training, implementation and review, ensuring a scaffolded approach to learning across qualification types in many countries, including South Africa (Long, Dunne, & De Kock, 2014).

Whereas the relevance of Bloom's framework has started to show signs of waning, especially in the online and distance learning environment, it has become difficult to question its validity from both an academic and regulatory perspective. The reason for this could be that the framework has proven to be both reliable and effective from a quality assurance and curriculum perspective (Soozandehfar & Adeli, 2016) and like most foundational frameworks found its way into legislative or regulatory documentation.

As each generation of qualification designers and evaluators has entered the South African Higher Education landscape, the focus has been more on ensuring the alignment to regulatory 'guidelines' rather than evaluating whether the fundamental framework of design is (a) being applied consistently, and (b) whether it is still an appropriate tool for the measurement of competency in a digitally evolving learning landscape. Mishka (2019) also makes reference to the influence that constitutional, socio-economic, geopolitical and cultural forces have on shaping the design of curriculum in open distance learning.

A qualification framework can provide the standardised structure to ensure consistency in a country's educational system; there is the risk that a heavily regulated qualification design system may restrict the curriculum experience to something easily assessable on a large scale rather than focusing on the essential knowledge required of a specific field (Gouedard, Pont, & Huang, 2020).

The framework that Bloom's taxonomy utilises in the design of learning outcomes has the potential effect of restricting the scope of learning outcomes and assessments to an individualistic, cognitive approach. As Bloom's taxonomy (original and revised) was developed with the traditional contact classroom environment in mind, it may not take advantage of new learning activities and opportunities presented through the use of 4th Industrial Revolution tools such as Web 2.0 technologies, virtual simulations and artificial intelligence. It is the identification of these specific limitations within Bloom's taxonomy that led Churches (2008) to propose the 'Bloom's Digital Taxonomy as a necessary evolution of the taxonomy to accommodate the collaborative and technological demands of the digital age.

The requirement to align to a taxonomy that has not evolved alongside technological and pedagogical advancements has the potential to create conflict with an institution's desire to create qualifications framed within a more social-constructivist approach, while instilling the digital literacy skills required to find employment in a 4th Industrial Revolution. The same can be said of institutions attempting to utilise connectivist approaches. While choosing to focus on the benefits of networked and online learning, they are faced with the potential obstacle of trying to frame learning outcomes in a cognitivist framework to ensure alignment with regulatory requirements. The Higher Education Qualification Sub-Framework (HEQSF) of South Africa utilises a 'nested approach' to qualification design, moving from the generic to the specific as a means of qualification design. This can also be seen in the way the qualification design moves from the level descriptor to the qualification descriptor, type, then qualifier (Van Koller, 2010). In addition, level descriptors are specified by the NQF as a means of differentiating between qualifications based on the degree of complexity. The same strategy is used for the design of assessment, measuring individual competency levels through the use of action verbs (South African Department of Education, 2007), an approach well aligned with cognitive pedagogies.

As emerging technologies have pushed the evolution of learning theories and pedagogical approaches forward into the realms of social-constructivism and connectivism, the question is whether a digital version of Bloom's taxonomy might accommodate a technologically-orientated student cohort better than its traditional, cognitivist-behaviourist counterpart.

Vygotsky's social constructivism emphasises the role of interaction and dialogue in creating cognitive growth or discovering meaning when engaging with knowledgeable peers (Sharma & Shukla, 2023). Siemens' theories on connectivism framed the learning experience within a 'network-based' system. This system harnesses the ability of technology and the digital world to vastly increase the accessibility of knowledgeable individuals, communities of practice, and professionals globally.

Previous research conducted by Momen, Ebrahimi, and Hassan (2023) proposed that Bloom's taxonomy (original and revised) still has a place in the primary and secondary stages of education as a supervised learning model, where the emphasis is on developing conventional or fundamental cognitive skills. At the higher education level, however, where graduate attributes tend to highlight the importance of digital competencies in relation to overall graduate employability, Bloom's taxonomy may not offer the ability to frame such digital skills "in the hierarchy of the cognitive domain" (Amin & Mirza, 2020:1) to effectively find gainful employment in a technological-focused economy.

1.3. BACKGROUND TO THE STUDY

Before exploring the role of Bloom's taxonomy in an evolving educational landscape, one first needs to establish the background on how one's definition of curriculum shapes the design and development of a qualification as a whole. When defining curriculum, an integrated approach allows for the acknowledgement of the importance of a structured curriculum, whilst still being cognisant of the role of the environment or student experiences as part of the learning journey. In a simple definition, Nollmeyer and Van Wig (2022:1) define an integrated curriculum as a curriculum that "connect[s] knowledge and skills from multiple subject areas into an individual learning experience."

For the purposes of this research, a curriculum is described as a deliberate attempt to formulate a strategic sequence of tasks or experiences. These tasks are designed to enable students to develop intrinsic layers of knowledge, skills, and competencies in a specific field. The progression follows a structured path, ranging from foundational to expert levels. Within this framework, the individual components of the field of study are identified and categorised. They are recognised either as proven scientific facts or as accepted societal and cultural norms and belief structures. The curriculum is presented in an environment that fosters safe exploration and experimentation with the identified competencies.

The description or interpretation of ‘curriculum’ as described in the above paragraph ensures that students progress in complexity only once the previous level of competency in skill and knowledge has been adequately assessed and achieved.

The South African Higher Education Act 101 of 1997 (South African Government, 1997), later amended by the Higher Education Amendment Act 9 of 2016 (South African Government, 2016), provides the outline for how the higher education landscape will be regulated.

Two primary government regulatory bodies work closely with one another, namely the Council on Higher Education (CHE) and the South African Qualifications Authority (SAQA). These regulatory bodies are “assigned the responsibility for the generation and setting of standards for all higher education qualifications and for ensuring that such qualifications meet the criteria for registration on the NQF” (South African Government, 1997:7). SAQA is the regulatory body responsible for the National Qualification Framework (NQF), a framework that classifies the various levels of qualifications that one can achieve in South Africa, building on the level of cognitive demand and skill competency requirements. For the purpose of this research, the study will focus solely on those qualifications listed on levels 5-10 of the NQF, which fall within the scope of the CHE’s Higher Education Qualifications Sub-Framework (HEQSF). In research conducted by dos Reis et al. (2022), it was highlighted that, whilst national policy refers to how the NQF structures education in South Africa, there is a lack of legislated policy offering clear guidelines to higher education on how to use Bloom’s taxonomy in designing curricula and assessing competency levels effectively.

Bloom’s Taxonomy is the framework used to align measurable outcomes with specific ‘action verbs’ associated with each level of cognitive complexity, thereby connecting them to the correct National Qualification Framework (NQF) levels (Matope et al., 2024). At each NQF level, specific level descriptors have been formulated around ten competency areas to cater for different knowledge types. In addition, it serves to ensure that both academic and occupational requirements have been met and that the scaffolded articulation of modules and qualifications provides clear learning pathways for students to pursue their educational journey (South African Qualifications Authority, 2012). SAQA describes the purpose of level descriptors as a tool to “ensure coherence in learning achievement in the allocation of qualifications and part qualifications to particular levels, and to facilitate the assessment of the national and international comparability of qualifications and part qualifications” (South African Qualifications Authority, 2012:3).

Bloom's taxonomy has provided the framework upon which the design of higher educational curriculum standardisation, accreditation, and quality education has been built. The last official revision of the framework was conducted in 2001 to offer clearer alignment with the educational practices of the time (Krathwohl, 2002).

As the 4th Industrial Revolution has brought with it new technological advancements and a shift in pedagogical approaches to social-constructivism and connectivism, it may be time for an additional revision of Bloom's taxonomy.

Bloom's taxonomy offers insights into the cognitive process and knowledge-type dimensions of individual learners, often guiding the manner in which assessment strategies are formulated (Larson, Endo, Yee, Do, & Lo, 2022). This framework has been influential in the approach of many higher education institutions utilising a traditional face-to-face or contact mode of provision. With the forced migration of higher education institutions to adopt a distance/blended learning and teaching approach in response to the global COVID-19 epidemic, academic thinking has shifted to a more social-constructivist and connectivist learning approach. Such a shift in pedagogical approaches potentially creates a positive learning environment, conducive to interactive engagement and collaborative learning (Moodley, 2022).

With the pace at which Web 2.0 and artificial intelligence technologies are evolving, including the various projects that both the SAQA and the CHE are currently implementing in an attempt to update and revitalise the public database on registered qualifications (i.e. the Re-registration of HEQSF-aligned qualifications on the National Qualifications Framework (CHE & SAQA, 2025)), two questions arise. Firstly, would a revised Digital Bloom's taxonomy be more aligned with modern curriculum, and secondly, would higher education professionals be open to such a potential change? Internationally, there has been an increase in research focusing on the viability of what can be termed 'traditional' taxonomies as further evidence is produced that illustrates how a student's emotional and social status may influence the ability to learn (Irvine, 2021). Given the pace at which institutions are moving away from physical lecture rooms to online Learner Management Systems that promote collaborative learning, this expansion of taxonomies is likely to continue. For example, Akintolu, Dlamini and Letseka (2022) explored the potential benefits of introducing Bloom's digital taxonomy into an online distance learning (ODL) environment, which led to the formulation of the research problem.

1.4. PROBLEM FORMULATION

Effective qualification design and accreditation require the successful creation of learning outcomes and appropriate associated assessment criteria to guide the curation of content into a syllabus that is conducive to building the competencies required for a specific field of research or industry requirement.

This claim is supported by research conducted by Alfauzan and Tarchouna (2017:84) when they reference the European Centre for the Development of Vocational Training, pointing out that a high-quality curriculum is only achievable through the proper alignment of learning outcomes, assessment criteria, and pedagogical methodology. Oosthuizen et al. (2019) highlight the benefit of utilising Bloom's revised taxonomy in South Africa's diverse classroom environments as a tool for differentiating learning outcomes so that the varying cognitive needs of students may be addressed. In turn, the South African Curriculum Assessment Policy Statement (CAPS), states that there is a "requirement to apply Bloom's taxonomy when formulating assessment questions" (Green & Collett, 2021:7). The CAPS curriculum is a comprehensive policy document used in both the primary and secondary education sectors, providing detailed guidance on curriculum content and standardising teaching and assessment across education institutions (South African Government, 2025). CAPS has been cited here to illustrate the continuity of Bloom's revised taxonomy across the South African education system.

Whilst various theories, methodologies and pedagogical approaches have been utilised, Bloom's Taxonomy has established itself as highly influential within the South African higher education qualification regulatory environment, guiding the development of thousands of qualifications' learning outcomes in the public and private higher education sector. The level of influence of Bloom's taxonomy in the South African context can explicitly be seen within various legislative documents and research endeavours. The South African Higher Education Quality Committee acknowledged in 2006 that "although outcomes-based education forms the basis of our [South Africa's] education system, we, as academics, are still applying Bloom's Taxonomy of Educational Objectives in formulating educational and learning outcomes and assessment criteria" (Higher Education Quality Committee, 2006:42). Whereas Bloom's taxonomy has been widely accepted as the model for the design and development of South African qualifications, "there is no explicit national policy that guides higher education institutions (HEIs) on how to use Bloom's or any other taxonomy" (Dos Reis et al., 2022:37). As a result of vague implementation guidelines, this has created the potential for "a misalignment of learning science and the [Bloom's] taxonomy" (Newton, Da Silva, & Peters, 2020:4).

Curriculum practitioners and education professionals may implement Bloom's taxonomy (action verbs) differently based on their subjective interpretation and personal experience with the taxonomy, making it difficult to produce consistent outcomes across different practitioners and institutions (Soozandehfar & Adeli, 2016). It can be argued that the potential misalignment of action verbs of accredited qualifications on the SAQA database may be rectified through regular programme reviews, or the current joint initiative by the CHE and SAQA for NQF re-registration.

These potential misalignments can cause complications from an articulation perspective, both through higher education and out of higher education into the workplace. If higher education institutions are not using Bloom's taxonomy in a standardised fashion, and this is not being identified during the accreditation evaluation phase, this has the potential to work against future credit accumulation and transfer processes both within and between institutions.

Based upon the above discussions surrounding the potential misalignment or inconsistencies in the use of Bloom's taxonomy, it may be logically assumed that these variations in use might have been exacerbated over the decades through increases in technological integration and changes in pedagogical approach. With the COVID-19 pandemic forcing many higher education institutions to change their mode of provision to distance education, the question can again be raised as to the appropriateness of Bloom's taxonomy in a changing world. The research question follows from the research problem.

1.5. RESEARCH QUESTION

Rather than focusing on the potential impact of digital taxonomies on learning, teaching, and assessment strategies, this research serves to establish (1) the current state of registered qualifications as far as alignment to Bloom's taxonomy is concerned, through the identification of frequently used action verbs; and (2) the perspectives of higher education qualification design experts on the potential value of digital taxonomy both as a curriculum design tool and the role it plays at the regulatory level in the context of South African higher education. Based on the research area identified above, the following research question will form the foundation of this research, with four associated sub-questions:

What is the relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment?

a. At what level of semantic complexity are education professionals designing their exit level outcomes for accredited qualifications?

b. How might the use of specific action verbs influence the effectiveness of technologically aligned teaching strategies in open distance learning contexts?
c. What are the perspectives of education professionals on using Bloom's revised taxonomy versus adopting Digital taxonomies in qualification design for the 4th Industrial Revolution (4IR)?
d. What recommendations can be made to enhance the relevance and application of Bloom's Revised Taxonomy in a digitally-focused curriculum design?

1.6. AIM OF THE RESEARCH

This research aims to determine the ***relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment***.

Based on the aim, the objectives are:

a. To determine the level of semantic complexity used by education professionals in designing exit level outcomes for accredited qualifications.
b. To investigate how the use of specific action verbs influences the effectiveness of technologically aligned teaching strategies in open distance learning contexts.
c. To explore the perspectives of education professionals on the use of Bloom's Revised Taxonomy versus Digital Taxonomies in qualification design within a technology-driven educational context.
d. To identify recommendations for enhancing the relevance and application of Bloom's Revised Taxonomy in a digitally-focused curriculum design.

1.7. THEORETICAL FRAMEWORK

A social-constructivist theoretical framework was deemed to be appropriate for this research, following Vygotsky's 1978 social constructivism and Siemens' 2005 connectivism theories of social learning. Vygotsky's social constructivism emphasises the role of interaction and dialogue in creating cognitive growth or discovering meaning when engaging with knowledgeable peers (Sharma & Shukla, 2023). Through the sharing of ideas and concepts, gaps in knowledge may be bridged (Vygotsky, 1978). As South Africa moved into a more democratic government system, post the 1994 elections, the more contemporary South African education environment adopted a social-constructivist approach, attempting to incorporate the principles of ubuntu into a more inclusive educational system (Vandeyar & Mohale, 2022).

As a result, many of the early accredited qualifications listed in the South African Qualifications Authority database would have been designed following a similar pedagogical approach. Siemens' theory on connectivism framed the learning experience within a 'network-based' system, harnessing the ability of technology and the digital world to vastly increase the accessibility of knowledgeable individuals, communities of practice, and professionals globally (Siemens, 2005). This approach leverages technology's ability to enable collaboration outside of the constraints of physical interactions (Kurnaedi, 2025); a concept aligning well with this research's exploration of the traditional Bloom's taxonomy within the open distance learning environment.

The theoretical framework of the study will be explored in more depth in Chapter 2, Section 2. Bloom's revised taxonomy focuses on providing a structured framework to identify and classify increasingly complex levels of intellectual knowledge and competencies across skill levels (Ajayi, 2024).

Similarly, the first half of the research follows a structured and methodical theoretical approach to the analysis of official documentation to establish the most frequently used action verbs in the design of qualification exit level outcomes. The outcomes of this analysis will be used as foundational material for further discussions with education professionals, adopting the social-constructivist approach characterised by focusing on learning through social interaction, collaboration, and shared knowledge.

Considering emerging technologies, to determine the potential value of enhancing existing regulatory frameworks for qualification design through the utilisation of Bloom's digital taxonomy, the value of such an adoption will be established through semi-structured interviews and collaborative discourse with experienced education professionals, both active and retired.

1.8. RESEARCH METHODOLOGY

The research methodology is a vital component of any research activity, offering a skeletal structure including aspects of design (research paradigm, approach and type) and methodology (data collection and analysis) (Pandey & Pandey, 2015).

A comprehensive research structure contributes towards the trustworthiness and transparency of the research, allowing future researchers to duplicate the study or validate its findings, thus contributing towards the credibility and reliability of the research (Hyett, Kenny, & Dickson-Swift, 2014).

As part of the empirical research methods, content analysis was used to determine the frequency of action verb usage in exit level outcomes of accredited programmes, listed on the SAQA public database. The outcomes of the content analysis will form the foundation for a portion of the questions designed for qualitative semi-structured interviews with education professionals with experience in qualification design. The sections below will introduce the design and methods of the study.

1.8.1. Research Design

The research design offers guidelines on how the research will be conducted in order to ensure a reliable means by which to answer the proposed research questions. The research design helps to plan and mitigate any potential risks and allows for the systematic processes to provide the focus for the strategy for data collection and analysis (Khanday & Khanam, 2019).

As alluded to by Soozandehfar and Adeli (2016), the implementation of Bloom's taxonomy is a subjective experience, which is often open to the interpretation and experience of individual education professionals. As such, the primary means of research will firstly focus on the use of questionnaires (to establish the credibility of education professionals). Secondly, it will focus on semi-structured interviews to discover the perspectives of education professionals on the benefits (or limitations) of utilising a digitally aligned taxonomy for a technologically-focused pedagogical approach.

To ensure that the objectives of the research are comprehensively addressed, thereby ensuring adequate information upon which to base the semi-structured interviews, document analysis will be conducted on information sourced from SAQA's public online database. The results of the document analysis will provide reliable data upon which to base education professionals' experiences, perspectives and recommendations on the practical implications of a digitally-aligned taxonomy. The following sections offer a brief overview of how the chosen paradigm and approach contribute towards the success of the research, which will be further elaborated upon in Chapter 3: Research Design and Methods.

1.8.1.1. Paradigm

A research paradigm provides the framework around which the entire research endeavour will be built. The chosen paradigm provides information on how to describe the context or reality in which the research problem is framed. It also delineates the nature of the knowledge pertaining to the field of research, whilst simultaneously guiding the researchers on how to collect, analyse and interpret data in a manner that is academically sound and follows a

coherent and systematic approach (Shisanya, 2019). Although there are various research paradigms available, it has been suggested by leaders in the field of educational research that they can be grouped into four overarching categories (Kivunja & Kuyini, 2017), which have been summarised in the paragraphs to follow.

The positivist paradigm assumes that reality or 'truth' exists independently from the human observer or participant and can therefore be measured objectively through scientific means (Park, Konge, & Artino, 2019).

Quantitative data collection and analytical tools are used to identify causal relationships or to build predictive models (if-then scenarios). This approach follows a very structured and calculated approach that enables systematic, structured frameworks that might be easily replicable, thus ensuring credibility and transferability for future research endeavours. Through the utilisation of statistical tools and scientific methodology, it can be argued that the positivist paradigm allows researchers to generate generalisations and fundamental laws, easily replicable and verifiable (Alharahsheh & Pius, 2020).

The interpretivist believes that all knowledge is socially constructed, or in other words, reality is created, shaped and altered through the observations and interactions of participants (Pervin & Mokhtar, 2022). This approach assumes a more subjective stance compared to the positivist approach. Within the scope of education research, the interpretivist paradigm acknowledges the subjective interpretations of the participants and the meaning they assign to events or activities that form their reality. As a result, the qualitative engagement with research participants often yields more socially or culturally rich content that offers easier implementation opportunities. The subjectivity of such a paradigm does, however, create the potential for obtaining different outcomes based on variations in the data collected or participant samples chosen. The interpretivist paradigm creates the potential to "gain further depth through seeking experiences and perceptions of a particular social context" (Alharahsheh & Pius, 2020:43).

Whereas the positivist paradigm views the world as independent and the interpretivist paradigm views the world as a construct of individual engagement, the critical paradigm defines its worldview as being shaped through societal norms and power dynamics (Alhoussawi, 2023). This paradigm attempts to identify potential inequalities in a system or ideology, differentiating between majority and marginalised groups, in an attempt to bring about social change. Within the education research field, specifically the South African context, such an approach is useful in research concerned with addressing previous inequalities related to access to education in its various forms and questioning ethical and

systemic frameworks. The critical paradigm reflects on the ability of research findings to contribute towards the emancipation of groups and societies (Luckett, 2000).

The pragmatic paradigm adopts a ‘multi-modal’ approach to research, taking aspects from the various other paradigms to create research that may be practically applied in real-world contexts. The approach sees the value of both quantitative and qualitative research, each supplementing the other, to solve specific problems identified for a specific context. This paradigm “accommodates mixed or uses a variety of approaches in providing the best answer to the research question concerning the situation” (Okesina, 2020:61).

Given the qualitative nature of the research problem identified in this study, the interpretivist approach is seen to be the optimal paradigm.

The qualitative philosophical assumptions of the research, focusing on the subjective interpretation of education professionals and their use of Bloom’s taxonomy, provide the best scope for using the interpretivist paradigm. The content analysis of the exit level outcomes on the SAQA database, to form the foundation for further interview questions through the identification of frequently used verbs, further aligns with the interpretivism approach.

The subjective experience of curriculum designers and education professionals is a vital component in the effective development of qualifications. Too often, “the traditional approach to education research tends to ignore the importance of meaning, interaction, and interpretation of the actors in shaping behaviour” (Vrasidas, 2001:3). The interpretivist paradigm of this research endeavours to highlight the lived experience and understanding of education professionals intricately involved in the design of qualifications. It is the curriculum designers and education professionals who perceive and interpret the fundamental taxonomies and frameworks of curriculum design from their own subjective experiences, which will ultimately shape future graduate attributes and learning experiences.

As such, the proposed research design has the potential for a strong practical application as it speaks to future implementations of qualification design, a potentially complex problem that speaks to both practical methodology and subjective perspectives of stakeholders. When engaging in the qualitative study of education professionals’ perceptions of the continued relevance of Bloom’s Revised Taxonomy in a technologically-focused education landscape, the interpretivist perspective is most suitable.

Given the centrally controlled regulatory environment of the South African Higher Education environment, the subjective experiences of education professionals will provide contextualised meaning that would lend credibility to the validity of the continued use of Bloom's Revised Taxonomy. It will provide the foundations for further research into potential enhancements or suggest replacement frameworks that may offer more relevance within a social-constructivist or constructivist pedagogical approach.

The flexibility of the interpretivist paradigm allows for open-ended interviews, online discussions, document analysis, or similar virtual engagements to take place, ensuring that any themed analysis that ensues authenticity captures the opinions and insights of professional higher education professionals effectively (Frechette et al., 2020). When examining the perceptions of education professionals from the private and public sectors, it is important to acknowledge the differing economic and political factors that impact their perceptions, as well as potential different programme accreditation requirements (Stander & Herman, 2017).

Framing research within the Interpretivist paradigm ensures that "scholars can use their diverse viewpoints on phenomena to not just describe objects, people, or events, but also to deeply comprehend them in their socio-cultural contexts" (Pervin, 2022:422).

1.8.1.2. Approach

When examining the approach to be followed for this study, quantitative, qualitative, and mixed-method approaches were considered.

Quantitative approaches focus on systematic and objectively observable data collection and analysis to create theories that can be generalised to a larger population, or to identify 'cause-and-effect' relationships. Such approaches tend to hold more credibility due to their replicability (Zyoud, Bsharat, & Dweikat, 2024). Qualitative approaches are more exploratory, relying on subjective experience or interpretation to help define or gain deeper insights into behaviours or other social phenomena (Rahman, 2017). The methods used to collect and analyse data are more flexible than those of quantitative methodologies, allowing the researcher to modify methods to better accommodate the needs of the participants better or to adapt to potential changes in the observable environment. Mixed-methods, as the name suggests, allows for a combination of both quantitative and qualitative methodologies. Whilst more time- and resource-intensive, the mixed-methods approach uses a variety of methodologies to increase the reliability of the findings through a triangulation of objective and subjective findings (Ngulube & Ngulube, 2022).

A qualitative approach was selected for this study due to the nature of the anticipated engagement with education professionals on their interpretation and personal use of Bloom's taxonomy.

1.8.1.3. Type

As the study focuses on the application and relevance of Bloom's taxonomy in the higher education context from the perspective of the education professional, specifically within the scope of online distance learning, the research is well situated for a qualitative case study (Coombs, 2022). The research type aligns with that of a single-case study design, where a single group of higher education professionals with experience in qualification design becomes the focus of research regarding their use and perspectives on Bloom's taxonomy (a bounded system). More specifically, a descriptive case study approach was deemed most appropriate due to the desire to gain insight into the broader application of Bloom's taxonomy in higher education qualification design, both in its current status and future, digitally-aligned ODL environments (Baxter & Jack, 2010).

As this research forms part of a structured curriculum Master's degree, there is limited time available for multiple case study engagement for triangulation purposes.

However, as samples were taken from the KZN Quality Assurance Forum, the participants offered relevant insight into the higher education sector as a whole. A case study allowed for an in-depth exploration of the subjective experience and perspectives of the participants (Chowdhury and Shil, 2021), whilst also accounting for various variables such as institutional design policies and strategies, or personal experience and qualifications.

1.8.2. Research Methods

The research methods adopted for this study will follow best practices associated with qualitative case study design, seeking to explore the application and relevance of Bloom's taxonomy within a bounded group of higher education professionals who have experience in curriculum design.

This study is situated in the interpretivist paradigm, focusing on exploring the subjective perspectives and experiences of higher education professionals within the contexts of their specific institutions. Qualitative data analysis, specifically content and thematic analysis, will be used to identify potential patterns and themes, enriching the understanding of Bloom's taxonomy and its implementation from the perspective of education professionals' experiences.

The content analysis and thematic analysis support the goal of gaining a comprehensive understanding of the participants' experiences and perceptions of the use of Bloom's taxonomy within their institutional contexts. The process used for the selection of participants, sampling strategy, and data analysis techniques is summarised in the sub-sections below.

1.8.2.1. Selection Of Participants

For the semi-structured interviews, the KwaZulu-Natal Quality Assurance Forum (KZN-QAF) was chosen as the population group from which the sample will be drawn. The researcher for this study is the nominated secretariat for the KZN-QAF for 2025 and has access to the forum's member email database. The forum is a voluntary collective of various academic deans, quality assurance managers, and curriculum and accreditation professionals in both the private and public higher education sectors in KwaZulu-Natal, who meet quarterly to collaboratively discuss issues impacting Higher Education in South Africa. The members of the KZN-QAF represent a subset of the larger population of quality assurance and senior academic professionals in the wider South African context.

This is due to the nature of their qualifications, experience and vested interest in higher education across both the public and private sectors. Anonymised email correspondence was issued to all members of the KZN-QAF (thirty-one members), inviting them to express an interest in participating in the semi-structured interviews, following which time was scheduled for online video conferencing. This method of conducting semi-structured interviews was the most convenient means of interaction for the participants and allowed for objective recording and transcribing of the conversations. The conversation was further refined by focusing on programmes listed as Level 5-10 on the National Qualifications Framework (NQF).

1.8.2.2. Sampling

As the selection of participants for the semi-structured interviews was based on the ease of access to members of the KZN-QAF, convenience and purposive sampling were utilised. Convenience sampling refers to the non-probability selection of participants who are easily accessible to the researcher and are not selected based on specific characteristics. In this instance, as the researcher is the secretariat of the KwaZulu-Natal Quality Assurance forum (KZN-QAF), an open forum for higher education professionals from both the public and private sectors, selecting participants from this collective was efficient and practical (Stratton, 2021). The sampling method can also be considered purposive sampling, in that all the regular attendees of the KZN-QAF fall into the required demographic of Higher Education professionals from either the public or private sector, who have a vested interest in both quality assurance and qualification design.

As a result of the demographics of the KZN-QAF, any sample of participants selected from the forum will be able to offer rich, relevant comments on the questions posed (Stratton, 2024), aligning with the interpretivist paradigm of the research.

For the content analysis, stratified sampling was utilised to ensure representation of key qualification type subgroups across Levels 5-10 on the National Qualifications Framework (NQF), where the CHE was identified as the primary or delegated QA functionary. With respect to the analysis of documents accessed via the SAQA database, due to the large population size (5539) and the limited duration/scope of the mini-dissertation, a random selection of 6.5% of each qualification type was sampled to calculate the most frequently utilised verbs, totalling three hundred and sixty-two (362) qualifications. This sample size was used to ensure sufficient coverage across qualification types and NQF levels, thereby ensuring the credibility of the results of the content analysis when used as a key discussion item during the semi-structured interviews.

For the semi-structured interviews, a formal application was made to the Chair and Vice-Chair of the KZN-QAF for permission to email the relevant experts requesting participants in the research, of which seven (7) education professionals or academics with experience in curriculum design and accreditation were interviewed.

1.8.2.3. Research Instruments

There were three distinct research instruments utilised in this study.

For the document analysis of the HEQC-accredited qualifications listed on the SAQA database, Microsoft Excel was utilised as the database and analysis tool. The full details of its application are available in Section 3.4.3. Data processing.

When selecting suitable participants for the research, initial demographic questionnaires were issued to the target audience to establish interested participants' credibility and gather baseline demographic and contextual information. A Google Form was sent anonymously to members of the KZN-QAF, where they could enter their details if they wanted to participate in the study; a sample of the participant questionnaire is available in Appendix D. The questionnaire collected information on qualifications, experience, sector involvement, and areas of expertise to identify suitable experts in higher education curriculum design and quality assurance.

The primary qualitative instrument comprised seven semi-structured interviews with education professionals via online conferencing tools, such as Zoom or Microsoft Teams. These online

facilities have the ability to automatically record and transcribe the interviews. A minimum of forty-five minutes (45min) was allocated per interview. The interview consisted of open-ended questions designed to elicit discussions on their individual experiences, perspectives and recommendations on the future application of Bloom's taxonomy in the 4th Industrial Revolution. These transcriptions were then codified using Microsoft Excel and analysed using Pivot Tables.

1.8.2.4. Data Analysis

Content analysis can be described as a systematic data analysis method used to interpret documents through the use of coding and categorisation. Mayring (2019) describes content analysis as a methodology that is 'research question orientated,' characterised by its 'category-based nature, which supports the interpretation of textual data in alignment with research objectives.

For the content analysis portion of the research, data was obtained directly from the South African Qualifications Authority (SAQA) public database, focusing specifically on registered qualifications on the HEQSF, and accredited by the Higher Education Quality Committee (HEQC) of the Council on Higher Education (CHE).

The data required is publicly accessible via the SAQA online database (https://regqs.saqa.org.za/search.php?cat=qual). However, the information was captured in a more accessible Excel database format, with the action verb from each qualification's exit level outcome recorded for purposes of identifying the top ten most frequently used verbs in each qualification type. Pivot tables were used to analyse the raw data and to calculate the frequency tables for each qualification type. The number of verbs used in each exit level outcome was recorded as (1) single verb use, (2) two verbs used, or (3) three or more verbs in a single outcome. This classification was used to determine the level of semantic complexity of each statement. From a theoretical perspective, exit level outcomes should be designed with a single action verb and/or concept to ensure easily identifiable competency areas with mutually exclusive assessment measurables (Vedaraman & Stapleton, 2013).

Thematic analysis is another qualitative data analysis method used to discover implicit, explicit, or nuanced patterns or themes in text documents or transcripts through the use of coding to uncover deeper meaning in the information. Maguire and Delahunt (2017) describe thematic analysis as a flexible but systematic framework that can produce rich detail from text-based documents. For the individual interviews, thematic analysis was utilised to identify common themes or patterns emanating from the interviews held with the education professionals relating to their understanding and interpretation of Bloom's relevance in ODL

(Naeem, Ozuem, Howell, & Ranfagni, 2023). Due to the flexible nature by which thematic analysis operates, it may be described as more of a method rather than as a distinct methodology, with the process being defined as the "identification of patterns or themes within qualitative data" (Maguire & Delahunt, 2017:3352).

Braun and Clarke's six-phase framework for conducting a thematic analysis, as described by Maguire and Delahunt (2017), was followed according to the steps below:

- Step 1: Becoming familiar with the data – This is achieved through a comprehensive reading of all the transcripts from the semi-structured interviews to gain a full understanding of the breadth and depth of education professionals' personal experiences and opinions on Bloom's taxonomy.
- Step 2: Generating initial codes – The design of the questions in the interview guidelines was grouped according to themes, contributing to an initial coding system that aids in reducing the data into more manageable sections of information.
- Step 3: Searching for themes – The codes were applied to the transcripts in an attempt to identify patterns or themes related to the research questions.
- Step 4: Reviewing the themes – Once potential themes are identified, they will be critically reviewed, refined and checked against the original transcripts.
- Step 5: Defining the themes – Once the themes have been critically reviewed, the core of each theme will be refined to clarify what each theme represents and how they interact within the context of the research on the relevance of Bloom's taxonomy.
- Step 6: Write-up – The final step involves the presentation of the themes in a manner that provides meaningful answers to the research questions.

Braun and Clarke's six-phase framework is explained in more detail in Chapter 3, detailing how they were used in this research. The opinions and views of the education professionals concerning whether (a) Bloom's Revised Taxonomy is still relevant in today's technological landscape, and (b) recommendations for how an enhanced taxonomy utilising 'digital action verbs' might be implemented, were recorded, categorised, and analysed to establish a holistic overview of the qualitative results. The results of both the content analysis and thematic analysis were then reviewed in conjunction to contribute towards the overall findings.

1.9. ETHICAL CONSIDERATIONS

Whilst research is vital to the expansion of knowledge in any field and may also contribute towards the development of strategies to solve pertinent problems in our society, research will only hold societal value in the academic world if it is deemed to be ethical in nature.

The World Health Organisation (WHO) describes ethical research as any endeavour that "adhere[s] to ethical principles in order to protect the dignity, rights and welfare of research participants (WHO, n.d).

The above description focuses on the welfare of the research participants. Ethical considerations also incorporate procedural and operational expectations to ensure the reliability and validity of the research findings.

In research conducted by Ederio et al. (2023) on ethical research practices in education institutions, the emphasis on research participant wellbeing and confidentiality is again emphasised; however, attention is also drawn to the institutional requirements associated with the "planning, implementing or conducting, and sharing of research" (Ederio et al., 2023:2711).

There are two ethical considerations which must be addressed in the context of this research approach. For the document analysis, one must consider "data access, production transparency, and analytical transparency" (Franco, 2023). Before any data was extracted and analysed from SAQA's online database, the relevant 'SAQA POPIA Undertaking' application was requested from the saqasecretariat@saqa.org.za for authorisation (SAQA, 2022). The process of collecting and analysing the semantic complexity of exit level outcomes and the frequency of action verb usage was conducted using standard database software, such as Excel, and the pivot table functionality of such software. This process addressed both the production transparency and analytical transparency aspects of design.

For the semi-structured interviews, informed consent was obtained from required participants before any interaction proceeded, and the anonymity and confidentiality of all participants were guaranteed by assigning participants with numerical IDs rather than recording personal identifiers such as their names or institution of origin, a common approach used in qualitative research designs (Joseph, 2023).

For the research in its entirety, ethical clearance was obtained from UNISA's research ethics committee to ensure that the proposed research and methodology were aligned with institutional requirements.

1.10. TRUSTWORTHINESS

Within the context of qualitative research, Lincoln and Guba (1985) formally introduced the concept of trustworthiness as a framework to replace conventional positivist criteria. The framework consists of four essential elements, namely credibility, transferability,

dependability, and confirmability. Each of the elements of trustworthiness are further elaborated upon as defined by Ahmed (2024):

Credibility	–	The ability to engage with data or participants over an extended period, acknowledgement of personal bias, and the verification of results through triangulation.
Transferability	–	The degree to which the research methodology and findings are clearly defined to allow for findings to be transferred across different contexts or situations.
Dependability	–	The creation of a comprehensive audit trail of all processes and data collection methods used during the research to afford future researchers the ability to replicate the study.
Confirmability	–	The ability to ensure that the interpretation of the data and ultimate findings are as objective and neutral as possible, without influence by the researcher's personal biases.

For the content analysis of exit level outcomes obtained through the SAQA database, the data set for this research has been confirmed and authenticated by an official regulatory body, namely the South African Qualifications Authority, and thus can be deemed to be credible, confirmable and dependable. It can also be assumed that, due to the trustworthiness of the dataset, all exit level outcomes from programmes listed on the public database are aligned to the NQF and have correctly implemented Bloom's taxonomy when utilising action verbs.

All members of the KZN-QAF who participated in the semi-structured interviews are actively involved in Higher Education, as independent education consultants or are employed in various private and public higher education institutions. As the participants are all experienced education professionals, through both qualification and experience, their opinions and perspectives are deemed credible and dependable. The responses from the interviews were confirmed with the participants before analysis to ensure that their perspectives had been accurately recorded, further enforcing the trustworthiness of the research methodology and findings.

1.11. RESEARCH PLAN OF ACTION

The following table offers a summarised and visual representation of the research plan of action, which is covered in more detail in Chapter 3: Research Design and Methodology.

Table 1.1. Research Plan of Action

Guiding Research Question	
What is the relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment?	
Research Sub-Questions	1. At what level of semantic complexity are education professionals designing their exit level outcomes for accredited qualifications? 2. How do education professionals perceive the role of specific action verbs in supporting the pedagogical effectiveness of technologically aligned teaching strategies within ODL contexts? 3. What are the perspectives of education professionals on using Bloom's revised taxonomy versus adopting Digital taxonomies in qualification design for the 4th Industrial Revolution? 4. What recommendations can be made to enhance the relevance and application of Bloom's Revised Taxonomy in a digitally-focused curriculum design?
Pragmatic Supposition	
Epistemological Model	Interpretivist Allowed for content analysis to be integrated with thematic analysis to provide a more comprehensive understanding of the current and future South African regulatory landscape
Methodological Model	Qualitative Approach – Single Case Study Semi-structured interviews with education professionals allowed for an in-depth exploration of the subjective experience and perspectives of the participants in their personal use of Bloom's taxonomy.
Data Collection and Analysis	
Sampling	Convenience / Purposive Sampling Population of 30 academic professions from the KZN QA Forum; minimum sample size of 7 for semi-structured interviews Stratified Sampling Population of 5539 CHE accredited qualifications (NQF5-10) on the SAQA database; sample size of 362 qualifications for review.
Data Collection Tools	Document Analysis (SAQA Public Database) Extraction of exit level outcomes per qualification into an Excel database to calculate the semantic complexity of statements and frequency of verbs through the utilisation of Pivot tables. Questionnaire (Demographic information) A short questionnaire was emailed to the KZN_QAF mailing list to determine the professional demographics of members and to invite willing participants for the open-ended semi-structured interviews. Google Forms was used in the questionnaire design for data gathering. Semi-structured Interviews 45-minute, online individual interview sessions to engage in open-ended questions regarding the perceived reliability and validity of Bloom's taxonomy. Microsoft Teams was utilised for virtual engagement to record transcripts.

Methods of Analysis	Content Analysis ELO semantic complexity / Action verb frequency Thematic Analysis
Trustworthiness	
Credibility	All reviewed qualifications have been approved by the CHE and SAQA. Members of the KZN QAF were all employed as higher education professionals.
Transferability	The process of analysing exit level outcomes was clearly explained and could be duplicated on any database software
Dependability	Built-in pivot table functionality in database applications ensured that human error was avoided when calculating action verb frequency in exit level outcome design
Confirmability	The transcripts from semi-structured interviews were made available to participants to confirm that nothing had been misrepresented.
Ethical Considerations	
Ethical Considerations	● Permission was sought from the South African Qualifications Authority to utilise their database via the SAQA POPIA Undertaking form. ● SAQA ID and Institutional names were omitted from the research findings. ● Approval sought from the UNISA Ethics Committee to conduct the research. ● Informed consent of participants was received, ensuring anonymity through numerical ID allocation

1.12. CLARIFICATION OF KEY CONCEPTS

There are various terms and concepts used throughout the study that require a consistent interpretation to comprehend the intended focus of the research. The items listed below are representative of these underlying concepts.

4th Industrial Revolution: Sometimes referred to as 'Industry 4.0' or the 'Fourth Industrial Age, the 4th Industrial Revolution refers to a phase in industrial development that has incorporated digital and emerging technology into operational and strategic functions in an attempt to streamline processes (Zulu, Pretorius, & Van der Lingen, 2022). Utilising cloud-based technologies and online engagements, industrial activities have the ability to operate digitally on a global scale. The 5th industrial age is hypothesised to involve a more visible integration of artificial intelligence, machine learning and robotic interaction in industry.

Bloom's Revised Taxonomy: Originally designed in 1956 by Benjamin Bloom, the taxonomy was created to assist in classifying education goals or outcomes according to diverse levels of cognitive complexity, increasing in difficulty as the student progresses through the levels.

The taxonomy was created to offer a coherent and logical framework for the development of both curricula and assessment artefacts. The taxonomy was revised in 2001 with the introduction of ‘action verbs’ as a means of identifying observable outcomes or behaviours that might be assessed at each cognitive level to determine the student’s level of competency (Krathwohl, 2002).

Digital Taxonomy: Various models of digital taxonomies have been developed as the world moved into the 4th Industrial Revolution, and it was deemed necessary for graduates to exhibit digital literacy competencies. Digital taxonomies follow the same underlying principles as traditional taxonomies, creating coherent structures for learning outcomes and assessment development, pitched at increasingly complex cognitive levels to enhance skillsets. The digital aspect requires the inclusion of ‘actions or deliverables’ that are unique to the online or digital environment (Akintolu, Dlamini & Letseka, 2022).

Exit Level Outcomes (ELO’s): The ELO’s of a qualification describe the knowledge, skills and attitudes that a student must exhibit in order to be deemed competent in the field of study upon achieving a qualification (SAQA, 2023). Each ELO must be aligned to both the subject knowledge of the qualification and the NQF level of the qualification to ensure that the level of cognitive complexity requirement is correctly formulated. Action verbs are used to illustrate the type of activity or task the student must engage in to be assessed at the appropriate level for competency.

Open Distance Learning (ODL): The ODL mode of provision is designed to increase access to education for the larger population by reducing overhead costs and potentially engaging with students in educational pursuits regardless of their physical location (South African Department of Higher Education and Training, 2014). Learning and teaching tasks, along with other student support and administrative activities, are usually conducted online in a digital environment, thus aligning with the 4th Industrial Revolution requirement for students to graduate with a level of digital competency for engagement in the global economy.

Pedagogies: The term 'pedagogies' (or pedagogy) is used in its broadest sense to represent a comprehensive framework of educational theory and practice in the South African ODL environment. This definition explicitly encompasses all of the interrelated fields related to curriculum studies (the design of learning content), assessment theory (measurement of student competency) and instructional design (the creation of learning experiences); thereby acknowledging the holistic nature of the educational process in South Africa's technologically aligned distance learning environment.

Semantic Complexity: Semantic complexity in the context of this research refers to the number of ways a sentence, paragraph or statement may be interpreted by different individuals. The more ways an individual assigns meaning to a statement, the more complex the statement is. Verbs can have multiple meanings depending on their usage and other elements of a sentence structure. In the context of learning outcomes, a single verb would denote a single action or competency that a student must exhibit, and an assessor must observe.

If the learning outcome includes additional verbs, multiple actions could be presented, leading to uncertainty about which action must be observed to ensure the level of competency is achieved (Vedaraman & Stapleton, 2013). Whilst it is acknowledged that the term 'semantic complexity' covers the depth of meaning that can be ascribed to a text through the multi-layered nature of language, for this research of limited scope, the term 'semantic complexity' refers to the number of ways a sentence, paragraph or learning outcome may be interpreted by different individuals. As described in the methodology of this research, the number of verbs utilised in a single learning outcome (where an increasing number of verbs indicates a corresponding increase in the level of semantic complexity) directly impacts the number of ways in which that learning outcome may be interpreted, as aligned with the research of Vedaraman and Stapleton (2013). It is acknowledged that the scope of the field of study of a qualification will also impact the interpretation of learning outcomes, either adding or reducing the level of semantic complexity of the learning outcome, as well as the potential for common ‘grouping’ of action verbs to better facilitate understanding; however, whilst the researcher acknowledged the impact of these variables, they fall outside of the parameters of this research of limited scope.

Technologically aligned pedagogies: This refers to teaching and learning strategies that make a concerted and deliberate attempt to utilise and integrate appropriate technologies (terminology, hardware and software) into curriculum and programme designs. The objective of technology integration is to contribute towards the achievement of specific educational learning outcomes or goals (Borte & Lillejord, 2024).

1.13. DIVISION OF CHAPTERS

The chapters of the study are structured as follows:

Chapter 1: Introduction and Research Overview

This chapter introduces the premise for the research, beginning with an introduction and background on the application and future of Bloom’s Taxonomy within the context of Open

Distance Learning (ODL). The research problem, question, and aim are clearly stated, focusing on Bloom's taxonomy's relevance to technologically aligned pedagogies in the South African ODL environment. The chapter provides details on the chosen interpretivist paradigm, examining the qualitative research design and methodology, including an overview of participant selection, data collection through semi-structured interviews, and thematic analysis. Ethical considerations, trustworthiness, and the clarification of key concepts are addressed, followed by a brief conclusion to the chapter.

Chapter 2: Theoretical Framework And Literature Review

In chapter 2, the theoretical framework for the study is covered, referencing social-constructivism and connectivism to frame the research within the context of a digitally evolving higher education distance learning landscape. The reader is introduced to an exploration of the historical development and application of Bloom's taxonomy within higher education, specifically within the South African regulated educational environment, from early fundamental pedagogics, through to cognitive-behavioural and social-collaborativist pedagogical models. The section critically reviews existing literature on curriculum design relating to the development of learning outcomes. The comprehensive discussions and reviews of existing literature form the foundation for further analysis on the relevance of Bloom's taxonomy in contemporary open distance learning environments.

Chapter 3: Research Design and Methodology

Chapter 3 offers the reader a detailed, step-by-step exposition of the research design and methodology utilised during the research process. The rationale for the empirical research is established before offering a comprehensive discussion on the interpretivist research paradigm and the qualitative approach adopted. The research design expands upon the participant selection process, data collection methods involving content and thematic analysis, and the data processing strategies used. The key criteria to ensuring the trustworthiness of the research are provided, along with an account of the ethical considerations to ensure compliance with institutional research regulations and to protect the integrity and confidentiality of research participants and data sources.

Chapter 4: Data Analysis and Interpretation

Chapter 4 focuses on the findings of the research described in Chapter 3, following the content analysis of the qualification dataset and the thematic analysis of the semi-structured interview data. After presenting the results, the findings were compared with existing literature to identify potential similarities and differences. The chapter concludes by presenting an overall discussion and interpretation of these findings in relation to the research purpose.

Chapter 5: Summary, Conclusions, and Recommendations

Chapter 5, as the final chapter, offers a summary of the findings of the research alongside an integration with the literature review. The conclusions regarding the relevance of Bloom's Taxonomy within the South African ODL environment, and the sub-questions defined in Chapter 1, are answered. The chapter concludes by highlighting the potential limitations of the study, offering recommendations for future studies stemming from this research, and offering recommendations to both the South African regulatory bodies and education professionals on how they may approach the findings of whether Bloom's taxonomy is still relevant within the South African context.

1.14. CONCLUSION

In the first chapter, readers were introduced to the research question guiding the endeavours of this study, namely "What is the relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment?" The sub-questions stemming from this central discussion point further elaborate upon semantic complexity, action verb usage, education professionals' perspectives, and digital taxonomy relevance.

A brief outline was provided on the implementation of Bloom's taxonomy as a prominent tool within the South African Higher Education system, specifically on its role in the design and accreditation of qualifications, focusing especially on distance learning environments. The potential misalignment of action verbs following the transferability of Bloom's taxonomy from traditional cognitive frameworks to contemporary digitally enabled, socially collaborative pedagogies further lays the foundation for grasping the premise of the research question.

The research follows an interpretivist paradigm, using a qualitative, single-case study approach. Content analysis was used to evaluate the exit level outcomes of accredited qualifications listed on the SAQA database, whilst thematic analysis was used to further explore the perspectives of education professionals on the relevance of Bloom's taxonomy in contemporary curriculum design practices.

The second chapter of this study offers an in-depth discussion surrounding the theoretical framework guiding the research, after which a comprehensive review of existing literature on the development of the South African education environment, Bloom's taxonomy, and potential application of digital taxonomies in the open distance learning environment follows.

CHAPTER 2:
THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. INTRODUCTION

The previous chapter briefly explored how Bloom's Taxonomy has historically provided a structured approach to setting educational goals across multiple modes of provision, with this study focusing on the Open Distance Learning (ODL) environment within South Africa. The chapter introduced the main research question of whether the ongoing reliance on Bloom's taxonomy, which has remained relatively static over the past few decades as a curriculum design tool, still holds relevance in a learning and teaching environment characterised by significant advances in educational technology. The chosen research methodology that the study follows in attempting to examine this question was highlighted, providing the foundations for further elaboration in Chapter 2.

Chapter 2 is structured such that the theoretical framework of the study is comprehensively defined. It provides the foundation for further exploration into how the use of Bloom's taxonomy, as a prominent curriculum design and development tool, has been applied both globally and within the South African higher education context. To contextualise the focus of the research question, the main higher educational policies and regulations of South Africa are briefly identified before delving into the more theoretical aspects of the literature review.

A literature review is an important aspect of any research endeavour to ensure validity and reliability, as it "outlines the scope and quality of existing knowledge while effectively conveying the relevance of prior research" (Agidi & Jweriebor, 2024:162). This will ensure that the presuppositions and findings of the research are comparable with existing research. The examination of existing literature aligns with the social-constructivist theoretical framework for the study, where the interpretation of curriculum design or learning outcomes is often a collaborative exercise developed through peer interaction and social learning. Such a framework suits the open distance learning context well, because social engagement and online 'collective' learning activities challenge the use of static, or individualistic learning models. The scope of the literature review provides the context in which the proposed research will be situated and allows for a comparison of documented perspectives with those obtained from the semi-structured interviews of education professionals in this study.

First, the development of the South African Higher Education landscape from the pre- to the post-apartheid era is examined, determining how these political ideologies influenced learning theories of the time. Secondly, the use of Bloom's Taxonomy as a globally recognised tool for the creation of learning and assessment objectives is explored before moving to the final category of the review, namely an evaluation of the potential application of digitally enhanced taxonomies for use in an educational landscape, designed for the fourth and fifth industrial age. It is hoped that a 'past, present, future' approach to the exploration of learning theories and taxonomies provides a well-rounded literature review upon which to address the question of Bloom's Taxonomy's relevance in a contemporary digital environment.

The following section introduces the theoretical framework of the study, providing the guidelines upon which the rest of the research is based.

2.2. THEORETICAL FRAMEWORK

Before embarking upon any research endeavour, the process must be mapped and defined according to a specific theoretical framework to ensure not only the scientific validity and reliability of the research, but also to provide future researchers with the 'conceptual lens' through which to interpret and duplicate the proceedings if required (Luft, Joeng, Idsardi, & Gardner, 2022).

This study follows a theoretical framework guided by Vygotsky's 1978 social constructivism and Siemens' 2005 connectivist theory of social learning.

2.2.1. Vygotsky's 1978 Social Constructivism

Vygotsky's theory is founded on the principle that an individual's thinking and learning are shaped by their social interactions and the contextual environment in which those interactions take place. As a result, learning is seen as an active, constructive process, where individuals must actively engage with one another and their peers to expand their scope of knowledge.

Vygotsky claimed that knowledge is never a static product that is merely passed from an experienced teacher to a passive but receptive student, but rather knowledge is dynamically produced through constructive conversations and collaboration (Vygotsky, 1978). It is through the active engagement with others, who are potentially more knowledgeable, that knowledge is created and experienced instead of merely assimilated. This 'zone of proximal development' (ZPD) speaks to how knowledge can be strengthened through engaging with knowledgeable peers through a process referred to as scaffolding.

The ZPD refers to the cognitive space that exists between what a student would be able to accomplish independently and what they might be able to achieve through collaboration with a more knowledgeable peer (Sharma & Shukla, 2023). During this engagement, scaffolding refers to the assistance the knowledgeable peer is able to provide until such time as the student can internalise the concepts to engage with them without assistance.

The social constructivist approach offers value to this research by prioritising collective problem-solving and discussions between education professionals, where shared understanding offers the potential to uncover new thoughts or ideas (Purbasari et al., 2025). This ideology aligns well with the South African philosophy of Ubuntu in the educational sector, where an individual's intellectual growth is linked to their communal collaboration (Ngubane & Makua, 2021). One potential risk to the approach is that the opportunity for shared understanding and knowledge creation is limited to the skills and abilities of the 'knowledgeable peer' in creating a socially viable environment for collaborative discussion.

Vygotsky's approach forms the foundation for the research, relying on the social interactions with knowledge, education professionals sharing their personal perspectives and experiences with Bloom's taxonomy to help shape the contextual understanding of Bloom's perceived relevance in South Africa's ODL environment.

By acknowledging the education professionals participating in the semi-structured interviews as the 'knowledgeable peer', their lived experiences and expertise in the use of Bloom's taxonomy will assist in forming the 'scaffold' for developing a shared understanding of Bloom's relevance in a technologically orientated curriculum (Frechette et al., 2020). With its emphasis on language use and contextual perspectives, social constructivism aligns well with the use of semi-structured interviews for generating rich, qualitative data.

The potential limitation of Vygotsky's approach, as described as being dependent on the skills and abilities of the 'knowledgeable peer', is especially relevant for this study, which uses a bounded case study of seven educational professionals. Whilst all of the interviewees were selected based upon their extensive qualifications and experience in the South African higher education environment, there is always the risk that they may exhibit a narrow interpretation of Bloom's Taxonomy, which might skew the findings. Whilst the 'lived experiences' of the educational professionals will provide deep and contextualised insights into their perceptions of the relevance of Bloom's taxonomy in the South African ODL environment, the findings must be viewed as a localised exploration of perspective rather than a universal generalisation.

2.2.2. Siemens' 2005 Connectivist Theory

The connectivism learning theory focuses on the concept of learning through engagement with complex, networked environments in the digital environment, which aligns well with framing the research on Bloom's taxonomy within the ODL environment.

While Vygotsky's social constructivism explains how learning occurs within social groups, Siemens (2005) argues that connectivism provides a better explanation of the learning process for the digital age, where physical engagement is often absent. Through the use of online technologies, the scope of social engagement has expanded to include instant messaging, video conferencing, forums and blogs; any individual, database or learning artefact can become a 'node' of potential knowledge creation.

As a result of learning occurring through a networked environment, the ability to source the information has become just as important as learning how to engage with the information. Given that the South African programme accreditation system relies on peer evaluation of the suitability of Bloom's taxonomy and associated action verbs to accredit qualifications and programmes, the connectivism approach is suitable. This is mainly the case as the approach acknowledges that the experiences of the individual, shared with the larger network, contribute towards the enhancement of the knowledge field holistically.

Given that the study focuses on the relevance of Bloom's taxonomy in the ODL environment, the benefits of connectivism are seen through the acceptance and utilisation of technology to allow for the "fluid, dynamic interchange of ideas" (Krueger, Porter, & Burke, 1998:206) of education professionals from various backgrounds and locations. Due to the evolving nature of technology shaping the online distance learning environment, the connectivism theory posits that learning takes place in a rapidly changing world where an individual's personal knowledge is shared and elaborated upon within the larger networked environment. One of the main critiques of connectivism is that it can be seen as more of a pedagogical perspective of the modern learning environment rather than an independent learning theory. As a result of this, the utilisation of this theory alone in a country such as South Africa opens the potential for marginalisation of education professionals whose opinions may be different from those of their technologically confident peers. This is mainly because the digital divide across both teachers and education professionals remains a barrier.

The sample of seven education professionals from a higher quality assurance forum in KwaZulu-Natal allows the experiences and perspectives of a few qualified, and reasonably technologically confident, individuals to help expand on the knowledge and perceptions of

larger institutional networks. Utilising elements of Siemens' connectivism approach allows the researcher to use open-ended questions during the semi-structured interviews to encourage the participants to discover and offer additional information that they themselves may uncover as a result of the interactions with the predefined questions.

2.2.3. Application of the Theories to this Research

The research approach taken focuses on the understanding that knowledge generation, understanding and growth are shaped and guided through social interaction, and that language or dialogue is "the focal point in the development of shared understanding" (Suorsa, 2022:4). These premises are founded within Vygotsky's (1978) theory of social constructivism, where the inherent qualitative experiences gained through social collaboration with knowledgeable peers provide a fertile ground for "enhance[ing] collective problem-solving and skill development" (Purbasari et al., 2025:2). However, in the context of this study neither learning theory alone is sufficient to address the complex South African ODL landscape.

Whilst Vygotsky's social collaborativism allows for deep engagement through intellectual dialogue and the lived experience of participants, it does not take into consideration the full influence of technological, networked aspects of learning. Siemens' connectivism acknowledges the role and value of technologically orientated learning, contributing towards the larger online network, but it fails to realise the benefits of social interactions and the depth of knowledge that can be gained versus the breadth of knowledge available online. "Online learning depends on the fluid, dynamic interchange of ideas between students and facilitator" (Krueger, Porter, & Burke, 1998:206).

By combining these two theories into an integrated framework, the benefits of social constructivism can be experienced through the networked, technologically orientated functionality of connectivism. This integration highlights the value of social dialogue and knowledge exchange between education professionals in the online environment in discovering "new perspectives and reshape the underlying conceptions in existing practices" (Iraola, Romero, & Millera, M.J., 2024:1).

As this study explores the underlying theoretical assumptions of Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001) and the continued relevance thereof in South Africa's open distance learning (ODL) landscape, the following section frames the research as a whole within South Africa's current higher education policies and regulations before delving into the review of existing literature on Bloom's Taxonomy in a contemporary learning environment.

2.3. EDUCATION POLICIES AND REGULATION

As Bloom's taxonomy forms an integral part of curriculum design, with the development of learning and assessment criteria being linked to qualification accreditation, it is necessary to frame the discussion within the South African Higher Education legislative landscape.

The following sub-section introduces three South African policies and acts that directly influence Higher Education and are pertinent to the understanding of the subsequent literature review on the development of higher education in South Africa. This is followed by a brief discussion of the higher education regulatory bodies in South Africa.

2.3.1. South African Higher Education Legislation

Three specific South African policies and acts have been identified as being relevant for this research, namely: The Higher Education Act 101 of 1997 (as amended), The National Qualifications Framework Act 67 of 2008, and The Policy For The Provision Of Distance Education In South African Universities: In The Context Of An Integrated Postschool System (2014).

The South African Higher Education Act 101 was originally promulgated in 1997 to address existing legislation from the pre-apartheid era, providing for a better alignment of higher education policy and practice with the new democratic educational landscape. The purpose or objectives of the act were the creation and functional mandate of the Council on Higher Education (CHE), the revised operational structures of public higher education institutions and the regulatory processes required for the registration of private higher education institutions. The act also articulated the processes required for quality assurance and quality promotion throughout the higher education sector. Since its original creation, the act has undergone several amendments to respond to evolving needs, with the most recent amendment being the Higher Education Amendment Act 9 of 2016 (South African Government, 1997 & 2016).

The South African National Qualifications Framework Act 67 was first promulgated in 2008 to replace the earlier South African Qualifications Authority Act of 1995. The Act created the National Qualifications Framework (NQF) as a means of ensuring access to and mobility between qualification types and levels to promote the facilitation of learning or career pathways. The Act also provides detailed instructions on the roles and responsibilities of both the Minister of Higher Education and the Minister of Labour regarding the NQF and provides details on the continued governance of the South African Qualifications Authority (SAQA). It further provides information concerning the roles of various quality councils responsible for the different industry sectors of education and training.

Since its original creation, the South African National Qualifications Framework Act 67 has undergone several amendments to respond to emerging challenges in the education environment, with the most recent amendment being the National Qualifications Framework Amendment Act 12 of 2019 (South African Government, 2008 & 2019).

The Policy For The Provision Of Distance Education In South African Universities: In The Context Of An Integrated Postschool System was first introduced in 2014 to provide a guiding framework for the development and expansion of quality distance higher education. It was acknowledged that to address limitations in the existing infrastructure of traditional contact (face-to-face) learning environments, distance education as a mode of provision was a cost-effective means of increasing access into higher education for the larger South African population. Central to the policy was the implementation, monitoring and evaluation of technological tools, including the use of open educational resources (OER). The purpose of this was to create a structured system with quality standards, to position online distance learning (ODL) as an important tool for lifelong learning and the achievement of national higher education imperatives. (South African Department of Higher Education and Training, 2014).

2.3.2. Higher Education Regulatory Bodies

In the previous section, it was highlighted that the Higher Education Act 101 of 1997 created the Council on Higher Education (CHE), whilst the National Qualifications Framework Act 67 of 2008 provided clarity on the role and responsibilities of the South African Qualifications Authority (SAQA). In this section, both of these regulatory bodies are briefly examined.

The Council on Higher Education (CHE) advises the Minister of Higher Education on higher education matters, develops and manages the Higher Education Qualifications Sub-framework (HEQSF), accredits qualifications, and audits higher education institutions (HEIs). The CHE collaborates with the South African Qualifications Authority (SAQA), quality councils, and other professional bodies to ensure the integrity and credibility of the Higher Education landscape in the country (CHE, 2023).

The South African Qualifications Authority (SAQA) acts as the regulatory body overseeing the National Qualifications Framework (NQF), ensuring the legitimacy of accredited qualifications. SAQA's primary function is to register qualifications and part-qualifications on the NQF, confirm the function of professional bodies, offer evaluations of international qualifications for comparability purposes, and maintain the National Learners' Record Database.

From a qualification design perspective, SAQA also offers guidance on the development of curriculum and alignment with the various criteria for accreditation (SAQA, 2023). The table below illustrates the current structure of the South African National Qualifications Framework (NQF).

Table 2.1. South African National Qualifications Framework (NQF)

Level	Sub-Framework and Qualification Types			
10	HEQSF	Doctoral Degree	*	OQSF
9		Master's Degree	*	
8		Bachelor's Degree / Honours Degree / Postgraduate Diploma	Specialised Occupational Diploma	
7		Bachelor Degree Advanced Diploma	Advanced Occupational Diploma	
6		Diploma Advanced Certificate	Occupational Diploma Advanced Occupational Certificate	
5		Higher Certificate	Higher Occupational Certificate	
4	GFETQSF	National Certificate	National Occupational Certificate	
3		Intermediate Certificate	Intermediate Occupational Certificate	
2		Elementary Certificate	Elementary Occupational Certificate	
1		General Certificate	General Occupational Certificate	

Source: South African Qualifications Authority, 2023.

It is important to recognise the full scope of the NQF in terms of the proposed research methodology, which limits the scope of the data collection to qualification types on the HEQSF, specifically NQF 5-10 qualifications. The HEQSF utilises a 'nested approach' to qualification design, moving from the generic to the specific as a means of qualification design. This can also be seen in the way the qualification design moves from the level descriptor to the qualification descriptor, type, then qualifier (Van Koller, 2010). In addition, level descriptors are specified by the NQF as a means of differentiating between qualifications based on the degree of complexity.

As the primary custodian of maintaining the qualification online database, SAQA was approached to utilise the database for the research, and approved it through the signing of the authority's POPIA Undertaking form.

2.4. REVIEW OF EXISTING RESEARCH IN THE FIELD

When engaging in any form of research, it is important to explore and acknowledge previous research endeavours that have examined the field of study from varying perspectives. The process of literature review allows one to highlight potential gaps in previous studies and to clearly contextualise "the thesis within the research agenda of that field" (Leite, Padilha, &

Cecatti, 2019:1). Aligned to this premise, the following literature review is divided into three sections that provide the context in which the research question is being framed. The following Figure 2.1, 'Literature Review Contextual Framework', illustrates the three sub-categories that will guide the literature review.

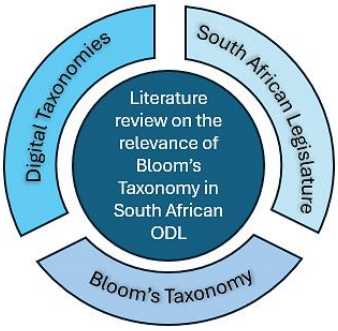

Figure 2.1. Literature Review Contextual Framework.
Source: Student's own

Before delving into the relevant literature, it is important to emphasise that the descriptive nature of certain sections, particularly the historical overview of the South African political educational landscape, was intentionally designed to establish the context in which the discussions around Bloom's taxonomy could be explored. While it is acknowledged that there are broader discussions surrounding the decolonisation or Africanisation of curriculum, these have not been included in the literature review so as to avoid introducing additional variables that might weaken the 'golden thread' that connects the research questions to the interpretivist findings. The descriptive exploration of some of the following sections is necessary before offering a more critical examination into the evolution of Bloom's taxonomy, to add value to the qualitative investigation of educational professionals' perspectives.

Firstly, the South African Education system has a unique history as a result of the apartheid regime and policies on racial segregation. The evolution of the political landscape, pedagogical approaches and evolution of distance education, pioneered by the University of South Africa, are explored to define the scope in which the research question is placed. Secondly, the theoretical underpinnings of Bloom's taxonomy as a guiding system for the development of learning outcomes and assessment criteria are reviewed from a global perspective, examining both the advantages and criticisms of the tool. Finally, a brief exploration into the development of emerging, digitally aligned taxonomies is explored as potential alternatives to Bloom's taxonomy, again examining the potential benefits and limitations of such adaptations.

2.4.1. Development of the South African Higher Education Environment

In 1997, then Secretary-General of the United Nations, Kofi Annan was quoted as saying, “Knowledge is power. Information is liberating. Education is the premise of progress” (Annan, 1997). Whilst this ideology may be true, it also holds for the manner in which education was utilised for control during the apartheid era in South Africa. During this period, Higher Education was designed to shape political ideologies, maintain power, and control the progress of society based on racial lines (Bunting, 2006). To understand the different approaches to education South Africa has adopted over the decades, more specifically the role and scope of distance education, it is important to consider the changes that took place in the country from the broader political, pedagogical and technological contexts.

The following sub-sections explore this progression in more detail. The first section explores how the political ideologies and shifts in legislature across the decades have influenced access, governance, and management for Higher Education Institutions. The guiding pedagogical theories implemented at a national level were influenced by the political developments of the time; thus, the selection, interpretation and implementation of the available learning theories are examined in the second section. Finally, South Africa's shift from traditional correspondence distance education to the more integrated and technology-aligned online distance learning model is explored. Together, these three sub-sections provide a sufficiently comprehensive context for further discussion on and evaluation of ODL and Bloom's taxonomy within South Africa.

2.4.1.1. Evolution of the Higher Education Political Landscape

The political ideologies of the apartheid era are complex and convoluted, with a large body of research articles delving into the various intricacies of its existence. For this review, a preliminary overview of the national legislation affecting education is the focal point. This will provide a broad understanding of how the South African political regulations and landscape shaped learning and teaching, and overall student engagement. Figure 2.2 at the end of this section provides a general timeline of the prominent legislation.

Bunting (2006:35) argues that South African higher education was deliberately "skewed in ways designed to entrench the power and privilege of the ruling white minority." This systemic entrenchment found its legal expression in the Bantu Education Act of 1953, which Robinson, Rusznyak, and Modiba (2024) identify as the primary mechanism for enforcing a political ideology of exclusion.

By prioritising segregation over equitable human development, the legislation ensured that access to specific fields of study remained a racialised privilege rather than a universal right. These principles were further enforced through the Extension of University Education Act 45 of 1959, which restricted access to higher education and further implemented segregation along racial lines. By the end of apartheid in 1994, Boughey and McKenna (2021:50) established that South Africa's higher education landscape consisted of "36 institutions split along the lines of race, language, and institutional type."

As a result of the transition to a democratic political system, it was necessary to restructure the fundamental legislation governing education in South Africa. In 1995, the South African Qualifications Authority Act was promulgated, forming the South African Qualifications Authority (SAQA) to establish a national framework for qualifications, which was later replaced by the National Qualifications Framework Act No 67 of 2008. The Higher Education Act 101 was promulgated in 1997 an attempt to create a more inclusive educational system, explicitly recognising distance education alongside traditional modes of provision.

The official recognition of distance education paved the way for open and online distance learning using emerging technology as a way of increasing access and inclusion in higher education. The Higher Education Act 101 of 1997 established the Council on Higher Education to implement more stringent quality assurance measures for higher education (refer to paragraph 2.3.2. Higher Education Regulatory Bodies above).

In 2008, the National Qualifications Framework Act 67 was promulgated to provide a more structured framework that allowed for the recognition of learning achievements and the articulation or progression of students along different learning and career paths (Matope et al., 2024) (refer to Table 2.1. South African National Qualifications Framework). These steps further strengthened distance learning as a legitimate mode of provision (Hendricks, 2019), allowing workers and remote learners the flexibility to pursue further education through online and blended approaches. During the same year as the publication of the National Qualifications Framework Act 67, the University of South Africa published its 'Open Distance Learning Policy', formalising its role as the only officially recognised institutional public provider of distance education in South Africa. This institutional policy aimed at operationalising the frameworks for distance learning established by the Higher Education Act 101 of 1997 and the National Qualifications Framework Act 67 of 2008, embracing information and communication technologies to stand at the forefront of technology-mediated learning.

To highlight the importance of education as a tool for economic redress and advancement in South Africa further, the National Development Plan 2030 (NDP 2030) was published in 2012.

This strategic plan emphasised higher education as a driver for economic development, social justice, and skills development; effectively recognising that “Higher education is the major driver of information and knowledge systems that contribute to economic development” (National Planning Commission, 2012:317). To achieve these objectives, distance learning was again endorsed for its ability to reach a broader audience through a more resource-efficient methodology. The White Paper for Post-School Education and Training was released the following year, in 2013, effectively operationalising many of the objectives established by the NDP 2030. The White Paper promoted the concept of technology-mediated learning through online distance learning initiatives, highlighting the benefits of shared infrastructure and resources between universities and Technical and Vocational Education and Training (TVET) colleges.

In 2014, the Policy for the Provision of Distance Education in South African Universities was published, with the intention of “Opening access to post-school education opportunities” and “Lower costs per student”. From this policy’s perspective, the University of South Africa (UNISA) was again identified as “the dedicated public provider of distance education in South Africa” (South African Department of Higher Education and Training, 2014:12); however, the policy did recognise the potential for other institutions to offer qualifications via the distance mode of provision. This clause potentially opened the opportunity for all higher education institutions to utilise online distance learning provision during the COVID-19 pandemic and during the national shutdowns.

The Higher Education Act 101 of 1997 (as amended) was amended in 2016 by the Higher Education Amendment Act 9, enhancing the authority of the previously created Council on Higher Education and expanding on the ability to utilise technology-enhanced learning pedagogies to enhance transformation and articulation policies. The National Qualifications Framework Act was likewise amended in 2019 through the National Qualifications Framework Amendment Act 12. As technology-enabled modalities increased the potential reach and scope of higher education institutions, the amendment to the National Qualifications Framework Act reinforced the South African Qualifications Authority’s verification and register-keeping functions, and criminalised falsification of qualifications under section 32B: Offences and penalties (South African Government, 2019).

In 2021, the Quality Assurance Framework for Higher Education in South Africa represented the South African government’s shift in focus, effectively moving away from the principles of audits towards the promotion of internal quality assurance systems. This shift in focus allowed institutions a greater degree of autonomy, subject to them demonstrating proficiency in their own internal quality management systems, which in turn encouraged further innovation in

online and distance learning. Finally, in 2025, the draft version of the Higher Education Qualifications Sub-framework (HEQSF) was released in alignment with the sentiments of the 2021 Quality Assurance Framework for Higher Education in South Africa, stating that “a less rigidly structured education and training system with flexible learning pathways promotes leveraging innovation and technological development, facilitates lifelong learning, and enables the pursuit of the goal of inclusive and equitable quality education (Government of South Africa, 2025:16).

The brief historical background in Figure 2.2 provides an additional legislative context that contributes to understanding how pedagogical approaches to education have evolved in the South African landscape towards the inclusion and endorsement of open and online distance learning.

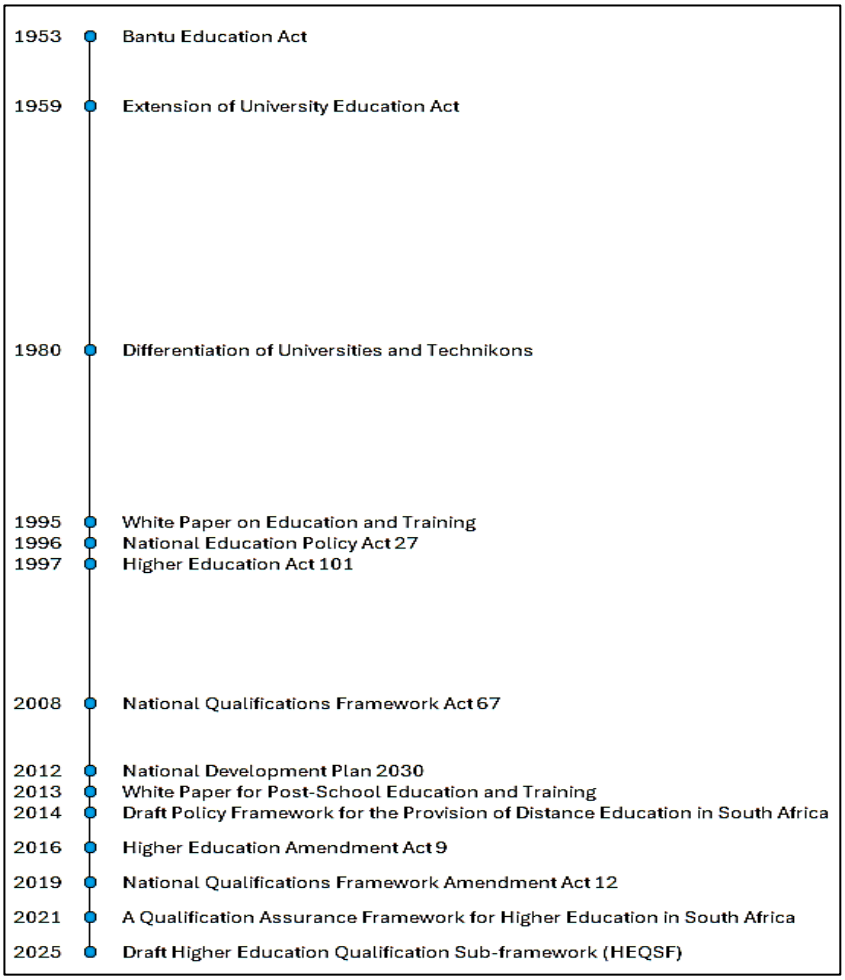

Figure 2.2. Timeline of South African Education Policies Influencing Higher Education

Source: Student’s own

2.4.1.2. Guiding Pedagogical Theories

Yonge (1990) noted that the Fundamental Pedagogics theory originated in post-World War II Holland as a 'philosophy of education' rather than a practical teaching strategy, where its implementation facilitated a rigid, parent-child approach to instruction. Robinson, Rusznyak, and Modiba (2024:766) observed that Fundamental Pedagogics served as the "dominant theoretical discourse" during the apartheid era, where they further suggested that this focus on rote learning and step-by-step instruction was a deliberate pedagogical choice that precluded the development of higher cognitive competencies.

Robinson, Rusznyak, and Modiba (2024) further described this philosophy as a means of producing simplistic, mass education designed for creating a compliant and intellectually limited workforce, thereby reinforcing social hierarchies through educational practice. This dogmatic approach to memorisation of skills and ideologies was adopted by and associated with the Apartheid Education system.

Ngobeni, Chibambo, and Divala (2023) highlighted that the 1994 transition to democracy necessitated a fundamental revision of South African educational policy. They suggested that this shift was required not only for alignment with international standards but to establish a progressive, learner-centred approach. By moving toward this model, the state aimed to ensure equitable opportunities for all students to engage in active learning and critical thought. Vandeyar and Mohale (2022) observed that contemporary South African education had pivoted toward a social-collaborativist pedagogy. This transition was marked by an attempt to integrate the indigenous principles of ubuntu, moving the focus from individualised instruction toward a more collective and collaborative learning environment.

Nijland and Vermeulen (2025:2) defined social-collaborative environments as spaces where individuals "collectively construct meaning" through active contribution and the sharing of perspectives. They argued that this emphasis on collective learning was essential for the dissemination of common knowledge, effectively positioning the learner as an active participant in a shared intellectual process. This collaborative process is positioned within Vygotsky's social constructivism theory, as explained in section 2.2.1. Vygotsky's 1978 Social Constructivism. With the shift into a democratic political environment, Ngubane and Makua (2021:2) drew the comparison between the principles of ubuntu and Vygotsky's social constructivism, noting that is "has a capacity to promote co-existence, social cohesion and inclusivity among students from diverse ethnic and cultural backgrounds".

In this approach, teachers and lecturers adopted the role of facilitators who guided and nurtured group dynamics and interactions within learning pathways. Ngubane and Makua (2021) proceed to describe how the synthesis of learning theories and philosophical ideologies provided the foundations for community-oriented and transformative educational practices that were previously unattainable in the apartheid era.

Circa November 2022, with the introduction of artificial intelligence in the form of the public release of ChatGPT, the focus again moved towards the role of pedagogies. Herlo (2017) conceptualised learning as an active process of forging connections between disparate points of information, ensuring that the learning process remains continual and self-sustaining as the network expands and builds upon itself. This networked approach was further contextualised by Kokkinos (2024:199), who claimed that the increasing use of virtual learning platforms had transitioned social learning into a state of connectivism "where information is abundant, and connections are formed across a networked landscape."

The student needs to be able to critically evaluate the information to which they are connecting to ensure the authenticity, validity and functionality before assimilating it into their worldview. Siemens (2005:4) indicates, “The need to evaluate the worthiness of learning something is a meta-skill that is applied before learning itself begins”. The instructor is seen as a “support agent in student development” (Stoten, 2021:189), encouraging the students to build their networks of information, and must therefore provide relevant opportunities for expansion.

As technology advances and increases access to higher education for large numbers of students, previously restricted from higher education either due to geographical location or finances, the connectivist pedagogical approach highlights the potential for a networked online distance learning (ODL) environment (Hendricks, 2019). It is under this premise that the progression of distance learning into online distance learning is explored.

2.4.1.3. Progression of Distance Learning into Online Distance Learning

When examining the development of distance learning, it is beneficial to describe both the pedagogical principles of the time and the available technologies accessible for distance learning. For this purpose, the framework of Anderson and Dron (2012) is utilised, whereby three generations of technology-enhanced distance education pedagogies can be explored.

The first generation of distance (or correspondence) education largely followed a cognitive-behaviourist pedagogical framework (Anderson & Dron, 2011). In this approach, learning objectives and assessment criteria were designed according to the ability of the learner to

complete tasks or activities individually, with the level of competency being measured according to observable behaviours or outputs.

According to Aoki (2012), the technology of the time was limited in its potential to deliver mass, multi-directional communication activities; hence, the mode of provision relied predominantly on text-based materials and assessment delivery via the postal service to individual learners. Bloom's taxonomy was sufficient as a tool for designing appropriate outcomes and assessment criteria as a means of measuring the individual's cognitive development and increasing complexity levels of the field of study, as the focus of learning was the independent learner (Anderson & Dron, 2011). Within the South African context, the University of South Africa was first established in 1873 and began offering qualifications via the distance mode of provision circa 1946 (UNISA, n.d.) following the first generation of distance education approach (i.e. text-based learning material delivery via the postal service).

The second generation of distance education followed the social-collaborativist approach, building on the works of Vygotsky (1978) and Dewey (1897). In this approach, social interaction becomes the focus of the learning experience, with the understanding that peer engagement, group discussions, and collaboration create the foundations for shared learning (Anderson & Dron, 2011). The concepts of collaborative problem solving or reflective dialogue were implementable in distance provisioning through technologies such as emails or live internet conferencing, increasing the ability to manage synchronous and asynchronous learning on a mass scale. Post the 1994 South African democratic elections, the University of South Africa was in a prime position to engage with the second generation of distance education, taking advantage of emerging technology (public internet) and promoting increased access to higher education through the use of online provisioning (Msila, 2021). The 2014 South African government legislated policy specifically concerning the provision of distance education in South Africa explicitly mentions the utilisation of "technology to improve the quality of distance provision" (South African Department of Higher Education and Training, 2014:10).

The third generation of distance learning integrates more closely with emerging technologies, most notably the increased use of social media as a form of networked interaction for digital information gathering and dissemination. Students are no longer merely consumers of knowledge, but are able to "find, sort, evaluate, filter, reformat and publish content on the net" (Anderson & Dron, 2012:8). These are all verbs or actions that were not part of the original Bloom's taxonomy and therefore not part of higher education assessment practitioners' repertoire.

The University of South Africa has taken cognisance of the shift in pedagogical approaches to the ODL environment, acknowledging the role of various social media applications useful in reducing transactional distance between the student, lecturer and the institution as a whole (UNISA, n.d.). This acknowledgement of the usefulness of social media as an essential pedagogical tool is further reflected in higher education institutions around the world, such as the Universitas Terbuka, a higher education institution in Indonesia for Open Distance Learning (ODL). Research conducted by Kuncoro and Thaha (2023) showed that the value and contribution of social media as an educational component offer opportunities for collaboration and social interaction.

Whilst the modes of provision and the pedagogical approaches associated with online distance education are adapting to the emergence of innovative technology, there have been previous studies that also "note the challenge to try to reconcile the need to design a coherent programme for accreditation and the notions of personal learning environments and emergent learning made possible through growing digitisation and connectivity" (Mays, 2017:148). The historical or traditional theoretical frameworks and tools related to curriculum and assessment design still form the basis for regulatory compliance and qualification accreditation in South Africa. It is from this premise that the literature review moves on to explore Bloom’s taxonomy and its potential application in a technologically provisioned learning environment.

2.4.2. Bloom’s Taxonomy

Bloom’s Taxonomy has had a strong influence on the foundation of many traditional higher education qualification accreditation frameworks, influencing not only the design of learning outcomes but also assessments and instructional design strategies (Newton, Da Silva, & Peters, 2020). In Europe, for example, it has been seen that "Bloom's taxonomy, or a variation, has had considerable influence over both French and Portuguese conceptualisations of knowledge, skills and attitudes" (Bulgarelli et al., 2009:52).

To offer a comprehensive and objective evaluation of Bloom's Taxonomy and its relevance in contemporary higher education sectors, more specifically within distance learning, it is important to provide an introduction to its historical development, its evolution, and its practical application. The following sub-sections attempt to unpack Bloom's Taxonomy in a logical progression, tracing the origins of Bloom's Taxonomy through to an overview of the revisions carried out on the taxonomy in 2001. The practical applications of Bloom's taxonomy as a curriculum design tool will then be elaborated upon before examining the benefits and limitations of the taxonomy in a contemporary, digitally-enabled ODL environment.

2.4.2.1. The Origin of Bloom's Taxonomy

Bloom's taxonomy was by no means the work of a single individual, but rather the result of concerted efforts by various researchers and educators in a collaborative committee setting between 1950 and 1960 (Krathwohl, 2002). The rationale behind the need for a unified taxonomy is that it would streamline the workload of education professionals in designing and standardising assessments and examinations across various levels of complexity and institutions.

Benjamin Bloom, one of the leading educational psychologists in the project, was strongly influenced by the work of his colleague Ralph Tyler, who published the Rationale for Curriculum Design in the 1930s (Chakraborty, 2025).

During this time in history, behaviourism was the preferred pedagogical approach, which can be seen in Tyler's research proposing that the development of learning outcomes should be focused on content, behaviour and skill components (Dennis, et al., 2024). As a result of Tyler's influential and leading pedagogical theories of the time, Chakraborty (2025:2255) pointed out that Bloom's taxonomy is thus "fundamentally grounded in the behaviourist tradition; however, it also reflects a shift towards the cognitive domain".

In the original 1956 design, the taxonomy focused solely on the cognitive domain of the learner, the individual's ability to acquire and utilise new knowledge (Krathwohl, 2002). The focus of the taxonomy was to create a framework to describe the various dimensions of knowledge, skills, and cognitive processes as an individual progressed steadily in an area of study, slowly increasing their skill sets in levels of complexity as they advanced.

In other words, the aim was to create a framework to allow "educators to determine what level of understanding a student had on a topic from memorising basic facts, to understanding a concept and reacting on it, and mastering the concept in a broad sense" (McLaughlin, 2017:75). The psychomotor domain was introduced in 1966 (Simpson, 1966) to accommodate those skills that required more physical or practical application to demonstrate competency, with the affective domain being introduced later (Krathwohl, Bloom, & Masia, 1964) to account for and to focus on an individual's development of feelings, emotions and social interactions.

It is important to acknowledge that the taxonomy was never meant to be purely a theoretical pedagogical artefact. Rather, it was designed from a highly pragmatic perspective to serve as an operational tool (Krathwohl, 2002) to meet the needs of education professionals at the time (bound by prominent pedagogical theories and available technological resources), hence the focus on observable and measurable criteria to ensure standardisation of assessment.

Due to the scientific manner in which the taxonomy allowed assessments to be quality-assured and implemented ‘en masse’, the scope of the taxonomy was later expanded to provide a framework for learning objectives, instructional design, and qualification accreditation (Ajayi, 2024). Steenkamp (2024) pointed out that whilst this ability to expand beyond the initial purpose and scope of the taxonomy’s intended use speaks to its versatility, it also opens the educational tool up to misinterpretation or criticism of its implementation.

2.4.2.2. Revised Version of Bloom’s Taxonomy

Ajayi (2024) explained that the 2001 revision of Bloom’s taxonomy by Anderson and Krathwohl was a calculated effort to mitigate the original framework’s perceived limitations. Central to this revision was the introduction of 'knowledge' as a distinct factor, a move Ajayi (2024) viewed as an expansion of the taxonomy’s scope beyond a one-dimensional cognitive focus. The University of Central Florida (n.d) maintained that this shift effectively reorganised the framework to highlight the dynamic interaction between cognitive processes and knowledge content.

The inclusion of the additional factor highlighted the interaction between what is learned and how it is processed, reflecting advancements in cognitive theories of the time. Four new types of knowledge were added to the taxonomy:

Table 2.2. Knowledge Dimension - Four Types of Knowledge

Knowledge Type	Description
Factual	Basic elements of a field of study, such as terminology
Conceptual	Discerning the relationship between elements or theoretical constructs
Procedural	Techniques and methodologies for completing specific tasks
Metacognitive	Knowledge about one’s own cognitive development & self-reflection

Source: Adapted from Anderson and Krathwohl (2001)

The revision to the original taxonomy involved the restructuring of the order in which the cognitive process dimension was categorised, illustrating a shift in the way the complexity of tasks was viewed. There was also a shift away from the categories being defined, using nouns to action verbs, resulting in a more obvious connection to an action-oriented taxonomy capable of creating observable and measurable learning objectives (Anderson & Krathwohl, 2001). The figure below illustrates the shift from noun to verb between the original and revised versions of the taxonomy.

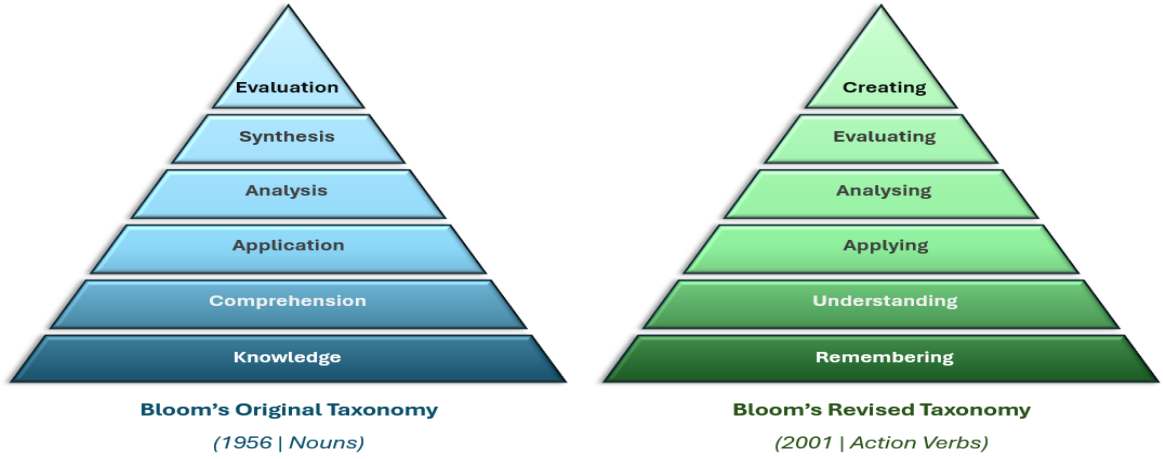

Figure 2.3. Bloom's Taxonomy (1956) Compared to Bloom's Revised Taxonomy (2001)
Source: Adapted from Anderson and Krathwohl (2001)

2.4.2.3. Utilisation of Bloom's Taxonomy

According to Ajayi (2024), there is an exhaustive list of fields and countries that have incorporated Bloom's taxonomy in the development and standardisation of their qualifications, speaking to its versatility and adaptability across educational contexts. For example, research conducted by Ching and Da Silva (2017) proposes that there is evidence of universities in Brazil utilising Bloom's taxonomy in undergraduate business courses in the development of learning outcomes and competencies. In Australasia, Bloom's taxonomy operates as an "explicit structure that has informed debates about the nature of educational experiences" (Barbour, 2005:26); whilst Lalchhandami and Malsawmi (2021) conducted research in India showing Bloom's Revised Taxonomy is referenced as a tool for setting learning objectives in secondary-level education.

Despite the taxonomy's universality, in research conducted by the University of the Western Cape, South Africa, by Dos Reis, Swanepoel, Yu, and Anciano, (2022:37) indicates, "there is no explicit national policy that guides higher education institutions (HEIs) on how to use Bloom's or any other taxonomy to assess students at the appropriate National Qualifications Framework (NQF) level." It can be argued that the procedural knowledge on how to utilise Bloom's revised taxonomy should be obtained by education professionals through their individual training and qualifications. West (2023:1) referred to "teacher education programs explore the value of Bloom's taxonomy as a metacognitive learning framework instead of a hierarchical assessment framework to create authentic learning opportunities to prepare preservice teachers for practice". If the taxonomy is the basis for successful accreditation of qualification designs in South Africa, the standards for its use should be regulated.

Although Bloom's taxonomy is used globally, there are still areas of concern over the use of the taxonomy, where it "should not be the only guide to design the curriculum for the subject" (Rahman & Manaf, 2017:251). The next two sections explore the documented benefits and perceived limitations of Bloom's taxonomy as a guiding tool for curriculum design.

2.4.2.4. Benefits of Bloom's Revised Taxonomy

Bloom's revised taxonomy, as a pragmatic educational tool, offers a standardised approach to designing measurable and objective assessment criteria (Ajayi, 2024). This structured and standardised approach supports evidence-based curriculum design (West, 2023), allowing vertical and horizontal articulation both within and between educational institutions. The taxonomy is also viewed as a universal tool, creating a shared language between institutions regardless of country, thereby facilitating international comparability and ensuring the development of high-quality educational qualifications (University of Central Florida, n.d). Krathwohl, Bloom and Masia (1964) explored Bloom's Taxonomy beyond its structural application in designing assessments, examining its usefulness as a framework for exploring the cognitive processing domain.

Both the original, and later revised version, of the taxonomy acted as a thought catalyst to move the teaching strategies of the time away from mere rote-learning (refer to fundamental pedagogics in Section 2.4.1.2. Guiding Pedagogical Theories) towards deeper learning focused on analysis, evaluation, and creativity, all seen through the hierarchical structure of the cognitive levels and action-verbs (Ajayi, 2024). Whilst the various benefits of Bloom's taxonomy have been identified, in some instances, it is these very same elements which also raise criticism against the taxonomy in the contemporary learning environment. The taxonomy's hierarchical structure, reliance on action verbs, and standardised cognitive levels can also present challenges when applied uncritically or beyond their original scope. The next sub-section explores some of the perceived limitations in more detail.

2.4.2.5. Limitations of Bloom's Revised Taxonomy

Whilst it is acknowledged that Bloom's taxonomy holds value in the educational landscape, its benefits are most explicitly seen in the areas where it is originally intended to be utilised, namely as a standardisation and assessment tool (West, 2023). Masapanta-Carrion and Velazquez-Iturbide (2018) highlighted in their research the potential limitations of Bloom's taxonomy that occur when there are attempts to expand the use of the educational tool outside of its original mandate and without taking into consideration the pedagogical approaches and technological advancements of the contextual environment.

Ajayi (2024) identified the linear illustration of cognitive development as a fundamental flaw in Bloom's original taxonomy. This critique suggested that the hierarchical pyramid ignores the reality of multidirectional learning or the potential for skill regression over time. Furthermore, while the visual format often leads to 'Remembering' and 'Understanding' being categorised as lower-order processes, it is essential to recognise that these skills form the critical foundation without which higher-order thinking and problem-solving cannot be achieved.

The second criticism against the taxonomy has been explained by Das, Mandal and Dasu (2021) as existing at the application-level concerning the correct usage of action-verbs to define movement between the cognitive levels, with multiple verbs often existing at multiple levels. This leads to the potential for misinterpretation when defining learning objectives and assessment criteria, resulting in learning paths that are misaligned with the intended complexity of the field of study. The expertise of an education practitioner in utilising Bloom's taxonomy can be influenced by something as simple as the user's competency in the language of learning; for example, a native English speaker might interpret verb usage very differently to a person who is a second or third language user, implying that the semantic difference across languages influences the effectiveness of Bloom's taxonomy (Mohamed, Zakar, & Alshaikhdeeb, 2019).

The third criticism against Bloom's taxonomy relates to contextual relevance. As technology has advanced and artificial intelligence (AI) has been integrated across various levels of both academic and operational performance, the use of traditional action verbs as a measure of cognitive processing may no longer be applicable (Akintolu, Dlamini, & Letseka, 2022). The increasing use of AI, often with no concrete method for determining its application at the assessment level, has the potential to negate some of the traditional assessment techniques relating to the ability to 'Understand' or "Remember', which have already been identified as fundamental to the development of higher-order thinking skills.

Following the COVID-19 pandemic, the forced migration towards an online, digital learning mode of delivery, and the integration of emerging technologies in collaboration with the adoption of a more social-constructivist and connectivist pedagogical approach, have called into question the efficacy of Bloom's revised taxonomy in a modern learning and teaching environment (Page, 2022). Larson et al. (2022) raised the concern that the use of 'traditional action verbs' does not provide sufficient scope for the assessment of competencies from the perspective of constructivist and collaborativist frameworks in digital learning. An additional 'updating' of Bloom's Revised Taxonomy is a potential way to ensure that the proven framework retains relevancy in a technologically evolving environment that is also shaping and altering preferred pedagogical approaches.

The traditional and revised versions of Bloom's Taxonomy have many proponents, and likewise detractors, supporting or denouncing the benefits of the taxonomy as a curriculum design tool. Whilst it cannot be said that Bloom's taxonomy has not contributed to the evolution and progression of modern pedagogical approaches, the next section explores the concept of digital taxonomies as the next evolutionary step, as more educators move into the online distance learning environment.

2.4.3. Application of Digital Taxonomies

Before engaging in a discussion on a potential 'Digital' taxonomy version, it is important to provide an example of such a Taxonomy as a point of reference for further discussions.

Alaghbary (2021) provides an image that comparatively illustrates the variations in key terms or verbs between the revised Bloom's taxonomy and potential digital taxonomies that take activities relevant to a digital age into consideration. Whilst the variations in verbs or terminologies may seem pedantic or irrelevant to some, they do allow for a larger scope of potential learning and assessment modalities to be introduced into the learning strategy. For example, the ability to 'programme, blog, hack, or categorise and share' does not hold meaning or intrinsic value unless framed within the online, digital context.

Table 2.3. Verb Comparison from Bloom's Revised Taxonomy and Proposed Digital Taxonomy.

Level 1 Remembering	Revised Bloom	Recognizing, Listing, Describing, Identifying, Retrieving, Naming, Locating, Finding
	Digital Bloom	Bullet pointing, bookmarking, social networking, social bookmarking, searching/googling
Level 2 Understanding	Revised Bloom	Interpreting, Summarizing, Inferring, Paraphrasing, Classifying, Comparing, Explaining
	Digital Bloom	Advanced searching, Blog journaling, Categorizing & Tagging, Commenting, Subscribing
Level 3 Applying	Revised Bloom	Carrying out, Using, Executing, Implementing, Showing, Exhibiting
	Digital Bloom	Running and operating, Playing, Uploading and sharing, Hacking, Editing
Level 4 Analyzing	Revised Bloom	Comparing, Organizing, Deconstructing, Attributing, Outlining, Structuring, Integrating
	Digital Bloom	Mashing, Linking, Reverse-engineering, Cracking
Level 5 Evaluating	Revised Bloom	Checking, Hypothesizing, Critiquing, Experimenting, Judging, Testing, Monitoring
	Digital Bloom	Blog commenting, Posting, Moderating, Collaborating, Networking, Testing, Validating
Level 6 Creating	Revised Bloom	Designing, Constructing, Planning, Producing, Inventing, Devising, Making
	Digital Bloom	Programming, Filming, Animating, Mixing, Directing, Producing, Blogging, Publishing

Source: Alaghbary, 2021

Whilst Alaghbary proposed another remediation (2021) to Bloom's taxonomy to incorporate the addition of 'digital verbs', there are alternative variations to Bloom's taxonomy that also take into consideration a technologically advanced learning environment.

In 2008, Andrew Church followed an additional approach to updating Bloom's taxonomy by simply incorporating additional 'digital verbs' pitched at each cognitive level, renaming the concept 'Bloom's Digital Taxonomy' (BDT). Jain and Samuel (2025) contend that while Bloom's Digital Taxonomy (BDT) is widely utilised within global, technology-enabled environments, it does not constitute a genuine theoretical revision. Their critique suggests that the BDT functions merely as an augmentation of the existing framework through the addition of digital verbs, rather than a pedagogical evolution. Consequently, the underlying pedagogical logic that informed the 1956 and 2001 versions remains essentially unchanged within the digital adaptation.

Darwazeh et al. (2023) proposed a more structural departure from the original framework through the 'Digital Learning Taxonomy' (DLT), which expanded the cognitive domain to ten distinct levels of complexity. By attempting to provide explicit guidelines for facilitating specific e-learning outcomes, Darwazeh (2017) moved beyond simple verb additions toward a comprehensive modification of the taxonomy's hierarchy. However, as Darwazeh et al. (2023) acknowledged, the DLT remains a relatively recent variation whose long-term effectiveness and reliability are still being evaluated within the field.

With the emergence of artificial intelligence, 'modern' variations of Bloom's taxonomy have attempted to take advantage of, or at least to acknowledge, the role of AI in learning and cognitive development. Hmoud and Shaqour (2024) identified a critical need to integrate artificial intelligence within the development of modern learning objectives through their 'Integrating Artificial Intelligence for Enhanced Learning' (AIEd) version of Bloom's taxonomy. Their model reconfigures cognitive complexity into six specific categories: Collect, Adapt, Simulate, Process, Evaluate, and Innovate, which are designed to leverage AI tools as active supports in the teaching process. While this reflects a novel attempt to align the taxonomy with emerging technologies, Hmoud and Shaqour (2024) concluded that further evidence is required to establish its fit-for-purpose status in higher education.

While the aforementioned may make academic sense, for effective change to take place, one cannot simply replace one taxonomy with another, especially within the South African regulatory environment, where it forms an integral part of qualification accreditation, articulation, and overall institutional integrity. Barari et al. (2020:3) raise the point that for change to be successful, it needs to begin at the policy level through the establishment and standardisation of processes; "standards and indicators can be either used as a guide to design or evaluate e-learning initiatives from a pedagogical perspective".

It is to this point that the first stage of any proposed research must be to determine the degree to which historical qualifications are meeting the required expectations of regulatory bodies before any suggested improvements might be recommended. Only once a benchmark or point of reference has been established can discourse surrounding whether “the digital update of [Bloom’s] Taxonomy captures the continually emerging learning opportunities in technology-enhanced classrooms" (Alaghbary, 2021:4) be engaged.

The emergence of various digital taxonomies claiming to address the digital needs of a technologically evolving higher education landscape is inevitable. Whether they occur as a simple augmentation of Bloom's Taxonomy or propose a new approach to the categorisation of cognitive levels and learning outcomes design, each proposed alternative needs to be evaluated objectively. This should be done in terms of its potential contribution to future educational needs as well as the flaws or limitations in their designs. The next sub-section explores some of the potential benefits of implementing a digitally enhanced taxonomy.

2.4.3.1. Potential Benefits of a Digitally Revised Bloom’s Taxonomy

One cannot deny the effect technology is having on the educational world, whether the comparison is made of learning management systems replacing the traditional classroom with a virtual campus, or the integration of artificial intelligence assistants contributing towards adaptive learning initiatives (Haleem, Javaid, Qaadri, & Suman, 2022). Digitally revised taxonomies attempt to provide practical modifications to proven taxonomies that incorporate technological advancements to create relevant learning experiences and assessments.

Digital literacy is now equally as important as numerical and language literacy to operate in the 4th and 5th Industrial Revolution, hence the taxonomies that guide our learning attempt to develop these innate skills (Aboderin & Havenga, 2024). Laurillard (2008) was a strong proponent of the belief that if technology-enhanced pedagogies incorporate tools and frameworks that support personalised and adaptive learning, more time can be focused on the development of higher-order thinking and creativity.

2.4.3.2. Limitations of a Digital Taxonomy

One of the primary limitations or criticisms levelled against ‘modern’ digital taxonomies, as highlighted by Lillico (2024), is that they are founded upon traditional taxonomies such as Bloom’s Taxonomy, and therefore still carry many of the limitations or criticisms of the founding taxonomy.

Digital taxonomies founded upon Bloom's theories still follow a linear process of cognitive development without considering the potential for regression or multi-directional learning (Ajayi, 2024). Gkrimpizi and Peristeras (2022) cautioned that the application of digitally-enhanced taxonomies often rests on the flawed presupposition of universal technological access. In the context of developing nations like South Africa, they argued that such frameworks may inadvertently institutionalise imbalances in learner achievement. This suggests that financial inequalities and disparate access to resources could prevent a significant portion of the student population from reaching the learning outcomes defined by a digitally-focused taxonomy. Finally, as the findings of Zhai, Wibowo, and Li (2024) claimed, artificial intelligence in the educational landscape is a relatively modern occurrence; hence, there are still concerns regarding the overreliance of AI hindering rather than aiding cognitive development.

2.5. CONCLUSION

Chapter 2 aimed to establish the theoretical foundations for the study, together with a brief overview of relevant South African policies and acts influencing the Higher Education sector. These discussions, together with a triangulated approach to the review of existing literature, attempted to provide context to the research question identified in Chapter 1, namely, the relevance of Bloom's taxonomy in a digitally evolving educational ODL environment.

The chapter identified that the study would follow a social-constructivist theoretical framework, influenced by the works of Vygotsky and Siemens' social constructivism and connectivism theories. Emphasis was placed on the importance of social engagement and the role technology plays in social interactions, providing the basis for how knowledge is constructed in the ODL space and speaking to how the research for this study will be conducted. Both the Higher Education Act 101 of 1997 (as amended) and the National Qualifications Act 67 of 2008 were briefly described, together with the role they play in the South African Higher Education context, regulating the quality of both Higher Education Institutions and the accreditation of qualifications by the Higher Education Quality Committee of the Council on Higher Education and the South African Qualifications Authority.

The literature review adopted a triangulated methodology, exploring the educational landscape in South Africa from a political, pedagogical and migration to ODL provisioning perspective. A thorough review of Bloom's taxonomy was undertaken, exploring the origins, revisions, applications, and perceived benefits or limitations in the contemporary learning environment. Finally, the emergence of digitally aligned taxonomies was discussed to determine their potential benefits or shortcomings in a digitally aligned ODL space.

One of the primary gaps identified by the literature review is a perceived absence of investigation into how a taxonomy created at a time dominated by cognitivist and behaviourist pedagogical theories has been adapted to effectively align with the collaborativist and connectivist approaches of modern ODL environments. Secondly, there is a perceived lack of studies that explore the actions of education professionals when implementing Bloom's taxonomy, as these professionals become the medium through which the theoretical construct is practically applied to form the foundation of modern-day qualification design and exit level outcomes.

The focus of Chapter 3 is on the research design and methodology adopted in this study, specifically how to gather, analyse, and interpret the data required to evaluate the practical use and perceived relevance of Bloom's Taxonomy in South Africa's Online Distance Learning landscape.

CHAPTER 3:
RESEARCH DESIGN AND METHODS

3.1. INTRODUCTION

To determine whether Bloom's Taxonomy remains relevant for technologically aligned pedagogies in the South African open distance learning environment, the preceding chapter provided the contextual and historical lens through which the research was framed, and that has shaped the perspectives of education professionals involved in qualification design and delivery.

Over the past three decades, following the democratic elections that marked the end of apartheid, the South African Educational system (from primary through to higher education) underwent various political, operational, and pedagogical changes. Most notable of these changes has been the evolution of traditional distance learning into online distance learning. This evolution globally accommodated advancements in educational technology, and more specifically within the South African context, the utilisation of “technology to improve the quality of distance provision” (South African Department of Higher Education and Training, 2014:10). Despite these changes, the use of Bloom's Taxonomy as a prominent tool for designing and developing qualification learning outcomes has remained largely unchanged since the revision of Bloom's Taxonomy in 2001. The literature review provided a valuable context for the achievement of the objectives of this research. Most importantly, the literature review assisted in providing the historical context that shaped the perspectives of the education professionals on the relevance of Bloom's taxonomy. This, in turn, led to the identification of the influence these experiences may have on recommendations for enhancing Bloom’s Revised Taxonomy in a digitally-focused curriculum.

Chapter Three expands upon the theoretical discussion by providing a detailed account of the research design and methods employed in the study to investigate and achieve its aims and objectives. The chapter follows a logical structure by first exploring the rationale for the empirical research. This is then followed by a description of the research design, which includes an explanation of the selected paradigm, approach, and type of research. The research methods deployed during the study are stipulated, with a focus on the selection of participants, the processes of data collection, and the procedures applied in data processing. The trustworthiness of the research is addressed before concluding with the ethical considerations of the study as a whole.

The next section focuses on the empirical need for the research related to the perceived gap in regulatory guidance on the implementation and evaluation of Bloom's taxonomy as a guiding tool in qualification design.

3.2. RATIONALE FOR EMPIRICAL RESEARCH

As alluded to in both Chapters One and Two, regulations related to the use of Bloom's taxonomy as a guiding tool for the design of qualification learning outcomes for accreditation purposes are reliant predominantly on experiential learning as “there is no explicit national policy that guides higher education institutions (HEIs) on how to use Bloom’s or any other taxonomy” (Dos Reis et al., 2022:37). Before guidelines for the use of Bloom's taxonomy in a technology-aligned online distance learning environment can officially be established, there is a need to move beyond a purely theoretical analysis. This is done by anchoring future implementation processes in the findings of the lived experiences and professional practices of education professionals in South Africa.

This research is framed within an interpretivist model to “gain further depth [of knowledge] through seeking experiences and perceptions of a particular social context” (Alharahsheh & Pius, 2020:43). In this context, the perspectives of education professionals on the use and reliability of Bloom's Taxonomy in technology-aligned online distance learning are examined. This approach is justifiable as it aligns with the social-constructivist theoretical framework, guided by the works of Vygotsky’s social constructivism and Siemens' connectivism. In these two frameworks, learning is defined as “a continual process which occurs in different settings, including communities of practice, personal networks and workplace tasks” (Hendricks, 2019:7). The dual qualitative approach of utilising content analysis, when evaluating qualification exit level outcomes from the SAQA database, and thematic analysis, based on information gleaned from semi-structured interviews with education professionals, provides a detailed viewpoint of education professionals' perspectives of Bloom's taxonomy.

The empirical research of this study is designed to offer a detailed qualitative data set that can be used to further explore the practical implementation of Bloom's taxonomy in a technology-aligned online distance learning environment. The section that follows provides a detailed account of the design of the research, followed by the methods utilised.

3.3. RESEARCH DESIGN

The research design offers a roadmap or framework that guides the study towards responding to the research questions, ensuring that the evidence collected and analysed is done so ethically and appropriately. The design is structured in a logical sequence, first introducing interpretivism as the selected research paradigm, the rationale for selecting a qualitative research approach, and the research type, which defines the scope of the study through the use of a single, bounded case study.

3.3.1. Research Paradigm

A research paradigm represents the set of philosophical assumptions which will guide and shape the manner in which the research activities are implemented. The selected worldview guides the researcher in the nature of reality (ontology) and the nature of knowledge (epistemology) (Kivunja & Kuyini, 2017). This section justifies the use of the interpretivist paradigm, describing how it is the most applicable framework for this study. Interpretivism follows the belief that reality is formed through the collective understanding and experiences of society rather than a single objective reality that exists outside of the group waiting to be discovered (Alharahsheh and Pius, 2020). As Bloom's taxonomy was originally developed as a collaborative activity in 1956 by a committee of education professionals, led by the educational psychologist Benjamin Bloom (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956), it seems only fitting that the analysis of the taxonomy in a technologically aligned context be explored in a similar fashion.

The interpretivist paradigm emphasises the values of the subjective experiences and understanding of multiple education professionals involved in semi-structured interviews, originating from both the public and private higher education sectors. The variation in both the participants' years of experience and scope of practice allows the research questions to be examined from various perspectives. This facilitated attaching greater value to the individuals' working history and perspectives themselves, rather than trying to establish a single objective understanding of how Bloom's taxonomy was 'meant to be implemented' within the online distance learning environment. This is also supported by Mthembu & Mtshali (2013:1) who assert, "… learning is achieved by the active construction of knowledge supported by multiple perspectives within meaningful real contexts".

Framing the research within the interpretivist paradigm allows for the use of a qualitative approach for the capturing of the education professional narratives, whilst the use of a case study provides a specific context that has the potential for rich information to be explored.

The researcher in the interpretivist paradigm takes on the active role of eliciting responses and reflective thinking from the participants during the semi-structured interviews. Interpreting and analysing the responses to identify themes or commonalities within the constraints of the predefined research context through the use of thematic analysis (Pervin & Mokhtar, 2022) aligns with the social-constructivist theoretical framework introduced in Chapter 1, emphasising the co-creation of meaning through dialogue and interaction.

The researcher in this instance had the privilege of studying through public higher education institutions whilst working in qualification and curriculum design in both the public and private sectors across various modes of learning and teaching provision; thus, placing him in the unique position to be able to maintain neutrality and reduce potential researcher bias during the interpretation phase of the research.

To enhance the rigour and trustworthiness of the research framed within an interpretivist paradigm, the credibility of the research was ensured through the verification of participants' professional status prior to the semi-structured interviews, and the transcripts of the interviews will be shared with the individual participants to confirm accuracy and the initial identifications of themes (Ahmed, 2024). Comprehensive audit trails were maintained, together with detailed data tables for the analysis of qualification verb usage for purposes of confirmability, ensuring that the findings are based upon the education professionals' subjective realities.

3.3.2. Research Approach

Consistent with the interpretivist paradigm outlined in the previous section and expanded upon in the methodological overview provided in Section 1.7. Research Methodology, the study followed a qualitative research approach, as "qualitative approaches [are] prized for their breadth, contextual awareness, and capacity to convey the complexity of the human condition" (Sedhai, 2024:2), which aligned well with the study's focus on the perceptions of Bloom's taxonomy.

As the interpretivist paradigm values the subjective experiences and understanding of the study participants, a qualitative approach allows the research to move beyond simply 'yes/no' responses, and allows for the exploration of perceptions behind the 'how' and 'why' regarding the implementation of Bloom's taxonomy in the South African ODL context.

The qualitative approach ensures that sufficient data on qualification design (specifically the use of action verbs in the creation of exit level outcomes) is obtained to provide a rich dataset from which further discussions with education professionals can take place.

As the research follows an interpretivist paradigm, it is expected that the semi-structured interviews will allow for a flexible narrative approach, allowing the discussion to “focus on the topics at hand without constraining them to a particular format” (Machuri, Rasak, Alhansyi, & Syma, 2022:24).

This approach allows the education professionals to organically phrase their own counter-questions and responses during the discussion, whilst the researcher will maintain the focus of the interview by guiding the discussions around the central nodes; namely: the relevance of Bloom's taxonomy, the potential benefits of digitally-focused taxonomies, and the outcomes of the content analysis of exit level outcomes from SAQA's online public database.

3.3.3. Research Type

There are various research types available for the qualitative approach, including ethnography, phenomenology, grounded theory, and case studies. For the purposes of this study, a case study was selected to study a specific phenomenon (Bloom’s Taxonomy) within its own real-world context (South African Higher Education ODL) (Yin, 2018).

The effects of the COVID-19 pandemic lockdown across South Africa created a standardising effect on the modes of learning and teaching provision across all higher education institutions (Mestry, 2023), regardless of sector or field of study. Professionals across both the public and private sectors were exposed to the ODL environment, being required to create and adapt existing qualification pedagogies to accommodate the temporary industry ‘norm’. As a result of such exceptional circumstances, a single case study was selected for this research, focusing specifically on higher education professionals in the KwaZulu-Natal region, belonging to the KZN Quality Assurance Forum (KZN-QAF).

By ‘binding’ the case study to the KZN-QAF, the researcher was able to ensure that the data remains focused on qualified education professionals who have a shared knowledge and experience in the field of Higher Education provisioning. The KZN-QAF came into existence late in 2024, following the regional CHE/SAQA joint workshops on criteria for registration of qualifications and part-qualifications. During the workshops, the various regions were encouraged to develop their own informal quality assurance forums to encourage collaborative learning and understanding of the new Quality Assurance Framework (QAF) and develop Higher Education Practice Standards (HEPS). The members of the forum include education professionals from both the private and public sectors who have a keen interest in both qualification design and overall quality assurance in the higher education sector.

Members of the KZN-QAF were ideally placed to engage in this research as interviewees due to both their professional experience and interest in the field of study.

The single, bounded case study approach has limitations in its ability to generalise its findings across the wider higher education professionals population (Okowa & Odero, 2024); however, following the interpretivist paradigm discussed in Section 3.3.1., this limitation is deemed acceptable due to the potential specialised knowledge of the KZN-QAF members themselves and the potentially deep, contextually rich understanding of the qualification design process these individuals might be able to share (Okowa & Odero, 2024). The process of thematic review will enhance the validity of the findings by identifying and highlighting any themes or commonalities in perspectives encountered (Nowell, Norris, White, & Moules, 2017) across a minimum of seven semi-structured interviews.

Following the description of the research design, the next section focuses specifically on the research methods for data collection and analysis.

3.4. RESEARCH METHODS

The research methods used for this study were designed to address both the current practices of qualification design in South Africa and the perspectives of the education professionals who are engaged with those processes. By using both document analysis of nationally accredited qualifications and qualitative semi-structured interviews, the study allowed for cross-referencing the perspectives of the education professionals with the findings of the document analysis, with the latter providing additional content for discussion with the former.

The following subsections provide details on the selection of participants, how the data was gathered, and the process for interpreting the information using thematic and statistical analysis.

3.4.1. Selection of participants

The COVID-19 pandemic circumstances created a ‘standardised contextual background’ to the implementation of ODL in South Africa, allowing a subset of professionals to be identified, specifically from the KwaZulu-Natal region in South Africa, based on their expertise in qualification design and diverse institutional backgrounds. The perspectives and engagements with these education professionals were considered to be sufficient to gain a fair and comprehensive perspective of education professionals from both the public and private higher education sectors. Specifically, the population group of the study focuses on

members of the KwaZulu-Natal Quality Assurance Forum (KZN-QAF). Duplicate studies can be performed in different provinces where quality assurance forums or higher education communities of practice exist, as the demographics of the participants will be similar.

In this instance, convenience and purposive sampling were used to select seven willing participants with a minimum of at least an NQF level 8 qualification, as described in Section 1.7.2. Research Methods, to ensure experience at the postgraduate level. The selection of seven academic professionals for the semi-structured interviews, from the broader KwaZulu-Natal Quality Assurance Forum (KZN-QAF) membership of approximately thirty, was based upon the principles of saturation and data depth. These principles are often referenced when working with qualitative methodologies, where the quality or depth of responses is valued more than the quantity of responses or data obtained (Naeem, Ozuem, Howell, & Ranfagni, 2024). The concept of 'saturation' focuses on the premise that excessive interviews will no longer yield any additional results or insights as compared to a smaller number. The concept of 'data depth' also focuses on gaining comprehensive or nuanced data from the detailed exploration of participants' experiences and perspectives on Bloom's taxonomy. Given that a sample of seven participants for the semi-structured interviews represents approximately 24% of the larger KZN-QAF constituency, this number of participants was deemed adequate.

When selecting suitable participants for the research, initial demographic questionnaires were issued to the target audience to establish interested participants' credibility and gather baseline demographic and contextual information. The semi-structured interviews themselves formed the core source for data collection and thematic analysis, intending to gather in-depth perspectives and insights from a range of higher education institutional contexts.

A formal request (Appendix B: Request to Utilise KZN QA Forum Mailing List for Interviewee) was sent to the chair and vice-chair of the KZN-QAF for permission to issue email invitations to the full forum mailing list to participate in the anonymous demographic questionnaire, indicating their willingness to engage in further semi-structured interviews on the relevance of Bloom's Revised Taxonomy.

Before the email invitations were issued via the KZN-QAF mailing list, ethical clearance was obtained from the UNISA College of Education Research Ethics Committee (Appendix F: UNISA College of Education Research Ethics Committee). Any participant identifiers (personal names, contact details, SAQA ID numbers, and institutional names) were redacted to ensure the confidentiality of all stakeholders.

3.4.2. Data collection

The steps for data collection are aligned with the three instruments used in the research as described in the previous section.

Document Analysis

The first step of the data collection process involved the review of a randomised sample of qualifications ranging from NQF Level 5-10, where the CHE is identified as the primary or delegated QA functionary, on the SAQA online public database.

The review of the exit level outcomes from these qualifications offers verifiable information to initiate a data-informed discussion during the semi-structured interviews. Discussions surrounding the semantic complexity and use of common action verbs to frame learning outcomes at specific NQF levels provide a standardised foundation from which the discussions about the alignment and reliability of Bloom's taxonomy in the South African ODL environment may be initiated.

Access to accredited qualifications listed on the SAQA public database, registered under the Higher Education Qualifications Sub-framework (HEQSF), with the Council on Higher Education as the primary or delegated quality assurance authority, across the various qualification types from NQF 5 to 10, is available on the SAQA database at https://regqs.saqa.org.za/search.php?cat=qual. The randomised selection of the qualifications for review was calculated using a standard Microsoft Excel (=RAND()) function, the steps of which are provided in the following example:

Table 3.1. Example of how to create a randomised sample list using Microsoft Excel

	A	B	C
1	**Qualification Population Size (N) =**	80	
2	**Sample Size Percentage =**	6,5%	
3	**Qualification Sample Size (n) =**	5	
4			
5	**Population Intergers (1 to N)**	**Random Formula**	**Samples**
6	47	0,01209	0,01209
7	32	0,04151	0,04151
8	12	0,05973	0,05973
9	23	0,06331	0,06331
10	21	0,07120	0,07120
11	31	0,07120	0,07120
12	35	0,08040	0,08040

Step 1: Create the Calculation Format

- Cell B1 equals the total population size of the selected qualification type (N)
- Cell B2 equals the percentage size of the sample required, in this case 6.5%
- Cell B3 contains the formula [=ROUND(B1*B2;0)] to calculate the sample size (n)

Step 2: Create the Population Integer List

- From Cell B6, create a list from 1 to the total population number (N)
- Cell B6 contains the formula [=RAND()], which creates a random integer
- Drag the randomly generated integer the full length of the population list

Step 3: Save and sort the randomisation List

- Copy and paste the randomised values into the corresponding cells in C6 onwards to fix the variables.
- Sort the values from Cells A5 to the final randomised value in Cell C$, based upon the Cell C5 values [smallest to largest]
- The first (n) values in Cell A5 (population integer list) represent the random samples to be used.

Source: Student's own

The relevant qualification, based on its location number in the list of qualifications generated via the SAQA database search, was then reviewed. The details of the qualification (name, type, and specialisation) along with the exit level outcomes were extracted into an offline Microsoft Excel database. The verbs used in each exit level outcome were then identified according to both types of verb and the number of verbs used, and recorded alongside the corresponding qualification data to create a detailed dataset.

Demographic Questionnaires

A demographic questionnaire was administered prior to the qualitative semi-structured interviews to screen participants against the study's selection criteria (Section 3.4.1.) and to establish a profile of their professional backgrounds. A Google Form was sent anonymously to members of the KZN-QAF, where they could enter their details if they wanted to participate in the study. A sample of the participant questionnaire is available in Appendix D. The questionnaire collected information on qualifications, experience, sector involvement, and areas of expertise to identify suitable experts in higher education curriculum design and quality assurance.

Conducted at the same time as the initial document analysis, this process enabled the researcher to finalise the interview sample while document analysis data was being gathered. Seven eligible participants were selected, provided with information and consent documentation, and subsequently scheduled for online semi-structured interviews.

Semi-structured Interviews

For the purposes of collecting and extracting data from the semi-structured interviews, a brief demographic questionnaire was first issued to thirty-one members of the KZN-QAF to determine their suitability for the study (based upon the selection criteria of academic qualifications, sector experience, and area of expertise). Following this, seven members were selected to participate in further discussions, based on their having a minimum of an NQF Level 8 postgraduate qualification and experience in higher education in either curriculum design, accreditation, or quality assurance. A semi-structured interview guide was created comprising nine open-ended questions, grouped into three focus areas. The focus areas addressed (a) the use and perceived relevance of Bloom's Revised taxonomy, (b) perceptions related to digital taxonomies, and (c) a discussion on the findings of the SAQA Qualification exit level outcomes analysis. The full interview schedule is available in Appendix E: Semi-structured Interview Questions.

The management of the qualitative data collected during this research utilised current technologies, leveraging the transcription functionalities of online video conferencing tools (such as Microsoft Teams and various AI note-taking software) to produce verbatim transcripts of the semi-structured interviews, which were verified by the participants before further thematic analysis took place. Each interview session lasted approximately 45 minutes, following which a copy of the transcriptions was provided to the participants for verification.

3.4.3. Data processing

The data processing for this study required a dual approach, utilising both content analysis and thematic analysis as defined in Section 1.7.2.3. Data Analysis.

For the content analysis, Microsoft Excel provided the ideal database system for the collation and analysis of verb usage across the 362 qualification samples. Once the data was sorted into the appropriate table format, identifying the number of verbs used per exit level outcome and identifying the type of action verb, pivot tables were used to analyse the frequency and distribution of action verbs across qualification types. The semantic complexity of exit level outcomes was determined by categorising their use of single, two, or three or more verbs. The framework used for determining the semantic complexity of the exit level outcome statements was guided by literature advocating for the use of single action verbs to create clear and measurable learning outcomes.

For the analysis of the semi-structured interviews, Braun and Clarke's six-phase framework for conducting a thematic analysis, as described by Maguire and Delahunt (2017), was used for the coding and thematic analysis of the semi-structured interview transcripts.

Online large language models (LLMs) utilising artificial intelligence were used to assist in the analysis and evaluation of the language datasets to reduce the effects of human error or research bias in the identification and interpretation of potential themes. The researcher used a structured, multi-step approach to leverage the analytical capabilities of the large language model, specifically the use of Google's Gemini as the primary AI tool. This system was used as the research had access to the full educational profile, allowing advanced file uploads and processing functionalities that are not normally included in the 'free' profiles. Transcripts of the interviews were cleaned to protect interviewees' anonymity before being uploaded, alongside the predesigned interview question bank, codes, and focus areas (refer to Appendix E). The LLM was requested to extract verbatim quotes from the transcripts corresponding to these established questions and codes. To ensure the reliability of this automated extraction, the process was repeated in a secondary LLM model known as perplexity.ai to ascertain whether the same quotes were identified. Following the triangulation between generative AI models, the researcher manually catalogued the responses into a database for the 'physical' review and identification of themes and patterns. The clear actions and roles required for AI-assisted analysis and manual human-led interpretation of results helped to ensure the integrity of the interpretivist paradigm was maintained. A more detailed explanation of the process follows.

Initial themes were identified as:

- 'Current Use' of Bloom's Revised taxonomy (CUB)
- 'Perceived Relevance' of Bloom's Revised taxonomy (PRB)
- 'Impact Of' Bloom's Revised taxonomy on programme accreditation (IOB)
- 'Openness To' Digital taxonomies (OTD)
- 'Features of' Digital taxonomies (FOD)
- 'Comparison of' Digital taxonomies (COD)
- 'Semantic Complexity' of Exit Level Outcomes (SC)
- 'Frequency' of action verb use (Fr)

The interview transcripts were transferred from system-generated text documents to Microsoft Word for participant verification, and then moved to Microsoft Excel, where the database format was more conducive for coding and theme development, organising and cross-referencing the qualitative data. Any personal identifiers of the participants were redacted prior

to analysis, with data being labelled as ‘participant 1, participant 2, etc’ to protect the confidentiality of the participants.

The security of the databases was maintained by creating and utilising offline Microsoft Excel files, backed up onto physical external hard drives. The files were never made accessible via online cloud storage to prevent unauthorised online access.

With a detailed description of how participants were selected, data collected, and information analysed, the following section outlines how these processes all contribute towards the trustworthiness of the research endeavour.

3.5. TRUSTWORTHINESS

To ensure the trustworthiness of the research and the findings of the analysis, a concise and transparent methodology and research design have been described in the previous sections. To clarify the extent to which the design of the research has been aligned with the expectations of qualitative trustworthiness, the four elements of credibility, transferability, dependability, and confirmability will be expanded upon (Kakar, Rasheed, Rashid, & Akhtar, 2023).

Part of the interpretivist approach requires the researcher to account for their positioning within the research; which, in this case, is one of an 'insider researcher'. Whilst serving as the secretariat of the KZN-QAF provides the researcher with access to a unique group of higher education professionals in the KwaZulu-Natal region, it also has the potential to undermine the trustworthiness of the research through insider bias and unforeseen power dynamics. The researcher's dual role as a secretariat might influence the manner in which the educational professionals responded to the questions or their willingness to participate in the research. To manage any potential threat of power dynamics influencing the responses during the interviews, the researcher made it very clear about two fundamental aspects of the relationship. Firstly, the researcher openly acknowledged the seniority of the educational professionals from both a qualification and experience perspective, ensuring that the participants were viewed as the 'knowledgeable peer' in the interactions, aligned to Vygotsky's social constructionist approach. The interviewees were also assured of the independence of the research and the semi-structured interviews from the operations of the KZN-QAF, and they were reminded of the voluntary and anonymous nature of their contributions. The process of allowing the interview participants the opportunity to review the interview transcripts also ensured that the discussions were captured objectively, free of any potential interviewer bias in interpretation.

Credibility was ensured through the utilisation of extremely reliable and verifiable data sources and expert education professionals with the necessary qualifications and experience. The data for the examination of qualification exit level outcomes was extracted directly from the South African Qualifications Authority Database verbatim. Suitable participants selected for the semi-structured interviews were from the KZN-QAF and were all employees of recognisable and reputable higher education institutions in both the private and public sectors. The brief demographic questionnaire further refined the selection criteria to ensure only those individuals who met the qualification and experience criteria were eligible for participation.

Through the utilisation of detailed sampling strategies and comprehensive documentation across both the ELO content analysis and thematic reviews of semi-structured interviews, the research design offered step-by-step accounts of how the methodology can be duplicated and transferred to future studies. The dependability of the research was ensured through the systematic use of database management and analysis utilising offline Microsoft Excel applications. The verbatim transcripts of the semi-structured interviews were system-generated via the participants' preferred allocation for online video conferencing, checked by the participants themselves before analysis could take place (McKim, 2023).

As the qualitative research focused on the subjective perceptions of the education professionals, the researcher (being an experienced qualification and curriculum designer himself) was aware of the potential for researcher bias to influence the collection and analysis of the data.

As such, the confirmability of the research was assured through the regular active verification of data by the participants themselves to ensure that no misinterpretation was present prior to the thematic analysis. The utilisation of large language AI models (LLM) during the thematic analysis of the transcripts aided in ensuring that any themes identified during the analysis were done so in an objective and neutral manner, thereby reducing the potential for subjective researcher bias in theme identification and coding. Research supports that “LLM-based thematic analysis is an efficient and cost-effective tool for quickly generating initial codes and themes, and helping researchers familiarise themselves with textual data” (Wong, et al., 2025:37).

Having established the trustworthiness of the research, the following section highlights the ethical considerations that took place through the research process, and which lend credibility to the findings discussed in Chapter 4.

3.6. ETHICAL MEASURES

The ethical integrity of the research was assured throughout all the relevant stages of data collection, analysis and reporting by embedding ethical practices at key points of the research design to ensure the safety and confidentiality of the participants. Ethical considerations for the study were also addressed in Section 1.8. Ethical Considerations.

Steps were also taken to ensure compliance with the relevant regulatory bodies (SAQA) and the ethical guidelines of the Higher Education Institution (UNISA). Ethical clearance was formally obtained from the UNISA College of Education Research Ethics Committee (reference number 8044) by following the required online application process, thereby gaining approval for a period of three years (until 25 August 2028). All methodology described and implemented aligns with the initial research proposal and ethical clearance application, ensuring compliance with the institution's ethical requirements. Adhering to an institute of higher education's ethical research protocols offers an essential safeguard for both the researcher and the study participants (Ederio et al., 2023)

Although the data extracted for the qualification exit level outcome analysis was obtained from SAQA's publicly accessible database, express permission to utilise the data for the intended research purpose was communicated to the SAQA Secretariat through the submission of the required 'SAQA POPIA Undertaking' application form. This step, whilst not mandatory, reinforced the researcher's attempt to ensure the ethical management of sensitive qualification data. This additional process was in alignment with the regulatory requirements of SAQA's privacy statement and informed consent processes. The unique identifiers of each qualification extracted (including SAQA ID and institutional name) were redacted during the reporting stage of the research to ensure the confidentiality of the registered institutions. Even when information is publicly available, the researcher has a moral obligation to ensure that no harm comes to any participants or stakeholders in the study (Joseph, 2023).

From an ethical perspective, participation in the semi-structured interviews was voluntary, with all personal identifiers redacted to ensure the confidentiality of participants. Informed consent was ensured throughout the study, with participants being able to withdraw at any time during the research should they wish.

SAQA ID numbers and the names of institutions were redacted when gathering and analysing data from the SAQA online database to ensure the confidentiality of the education institutions as a whole.

All data during this study were collected and analysed for the exclusive purpose of this research endeavour. The findings of the Exit Level Outcome (ELO) analysis were shared with the participants during their semi-structured interviews to provide additional foundational content upon which to reflect and comment on the current use of Bloom's Revised Taxonomy in the design of learning outcomes. The verbatim transcripts from these interviews were also made available to the respective participants for verification prior to any further analysis, allowing them to maintain control over their personal inputs. By providing the interview participants with copies of the transcripts, the researcher upheld the 'pillars of trustworthiness' as described by Ahmed (2024), ensuring that the transcripts were a true reflection of the participants' perspectives.

These ethical design components were explicitly described throughout the research design and methodology to ensure that the ethical integrity of the research is maintained both in the primary instance and for any future attempts to duplicate or refine the research in any future studies.

3.7. CONCLUSION

Chapter 3 moved beyond the theoretical constructs defined in the first chapter, framed within the context of existing literature established in the second chapter, to offer a more practical view of the implementation of the research by defining the foundational framework and systematic processes guiding the research. The empirical rationale for the research was established, framing the research within an interpretivist paradigm to ensure that the subjective perspectives of education professionals formed the primary focus. The qualitative approach involving both content analysis of accredited qualifications on the SAQA database and the thematic analysis of semi-structured interviews with higher education professionals was described in detail to ensure the transparency of the research methodology and potential transferability of the research for future studies. A strong focus towards ethical compliance to ensure the integrity of the research findings and the overall protection of the participants' right to anonymity was embedded throughout the research design, contributing towards the overall trustworthiness of the research. The detailed and methodical approach to the research methodology creates the contextual background upon which the analysis and reporting of findings are discussed in the following chapter.

CHAPTER 4:
FINDINGS AND DISCUSSION

4.1. INTRODUCTION

The previous chapter provided a comprehensive description of the systems and processes that would create the foundation upon which the study is based. In this chapter, the findings from the research are presented and discussed to address the central purpose of this study; namely to establish (1) the current state of registered qualifications as far as alignment to Bloom's taxonomy is concerned, through the identification of frequently used action verbs; and (2) the perspectives of higher education qualification design experts on the potential value of digital taxonomy both as a curriculum design tool and the role it plays at the regulatory level in the context of South African higher education.

By examining the transcripts of the seven semi-structured interviews held with education professionals, utilising Braun and Clarke's thematic analysis framework, the findings firstly endeavour to answer the research question concerning the relevance of Bloom's Taxonomy for technologically aligned pedagogies in the South African open distance learning environment. Secondly, the results of the thematic analysis show the level of semantic complexity educational professionals employ when designing exit level outcomes for qualifications. This analysis also illuminates how the selection of specific action verbs influences the effectiveness of technologically aligned teaching strategies within open distance learning (ODL) contexts. Thirdly, the findings illustrate the perspectives of education professionals on the utility of Bloom's Revised Taxonomy versus Digital taxonomies for qualification design in the Fourth Industrial Age. Ultimately, the findings inform recommendations aimed at enhancing the relevance and practical application of Bloom's Revised Taxonomy in a digitally-focused curriculum design.

The following sections firstly present the findings of the qualification data set analysis from the SAQA online database, examining the frequency of verb use and the semantic complexity of exit level outcomes. After this, the thematic analysis of the semi-structured interviews is presented across five themes, followed by an overall discussion and interpretation of the findings as they relate to the overall research question.

4.2. GENERAL PARTICIPANT AND DATA INFORMATION

To provide the contextual background of the qualitative research, details on the SAQA-accredited qualification datasets and the demographics of the education professionals are provided.

4.2.1. Qualification Data Set (Document Analysis)

The stratified sampling of qualifications from the SAQA database was described in the previous section 3.4.1. 'Selection of participants'. The table below illustrates the qualification types included in the stratified sampling, the total population per qualification type at the time of data extraction, and the respective sample sizes.

Table 4.1. Total HEQSF Registered Qualifications with the CHE Listed as the Delegated QA Functionary

NQF LEVEL	QUALIFICATION TYPE	POPULATION SIZE *(N)*	SAMPLE SIZE *(n)*
05	Higher Certificate	334	22
06	Advanced Certificate	80	5
	Diploma	530	35
07	Advanced Diploma	385	25
	Bachelor Degree	943	61
08	Postgraduate Diploma	536	35
	Honours Degree	828	54
09	Master's Degree	1470	95
10	Doctoral Degrees	433	30
TOTAL		5539	362

Source: SAQA: Search for a Registered Qualification (https://regqs.saqa.org.za/search.php?cat=qual)

Qualifications were selected at random across the classification of educational subject matter fields (CESM), in an attempt to ensure fair representation across the fields. Further details on how this randomisation was completed is available in Table 3.1. Example of how to create a randomised sample list using Microsoft Excel.

4.2.2. Profile of Interview Participants

An anonymised Google form was issued to all members of the KZN-QAF, with the invitation to participate in the semi-structured interviews. The figure below illustrates the demographics of the education professionals who completed the form, with seven out of eight individuals agreeing to participate further in the study.

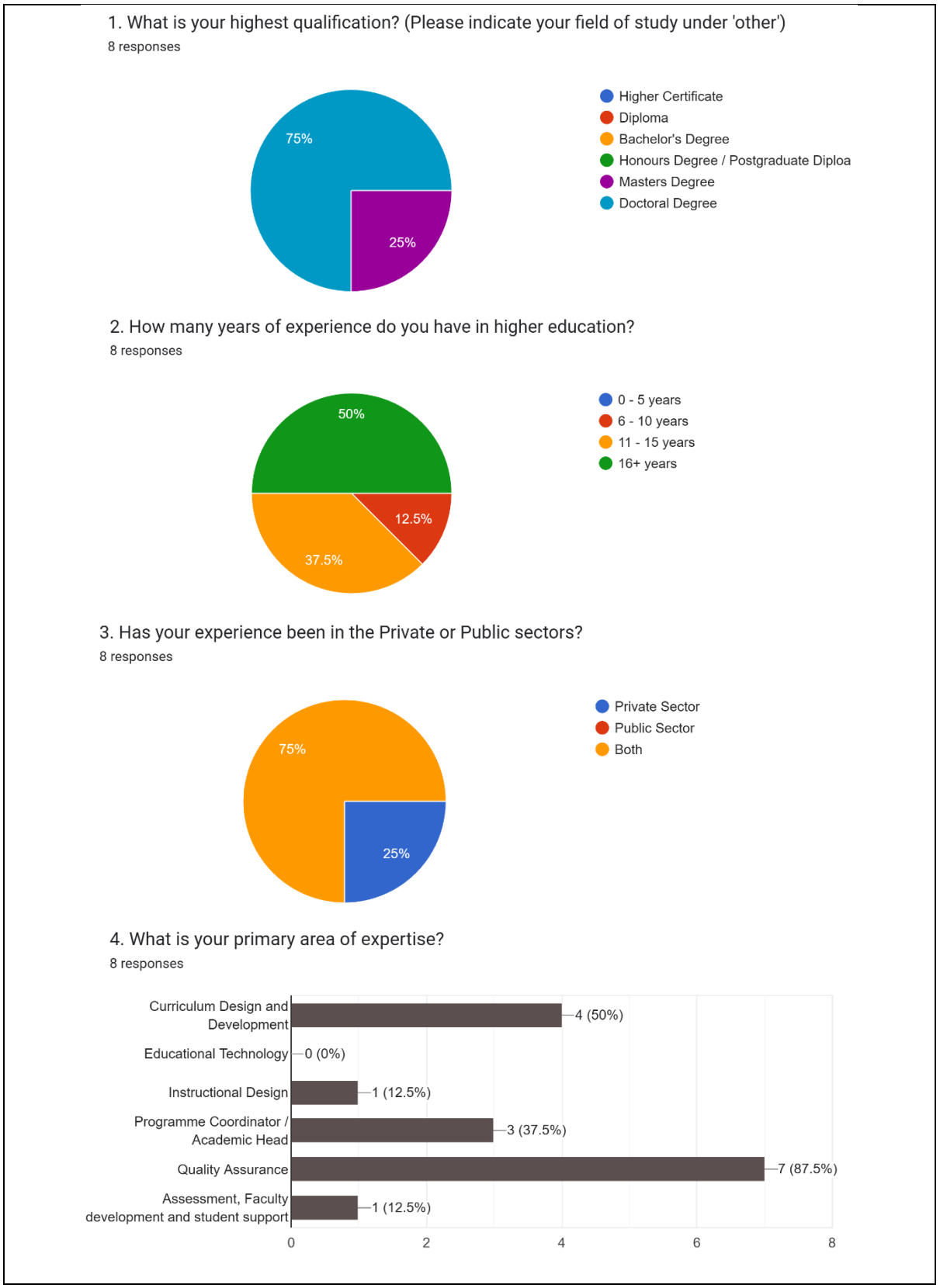

Figure 4.1. Demographics of Education Professional Participants.

Source: Google Forms

The participants in the semi-structured interviews were all highly experienced professionals, with six of the participants having a doctorate, and four of the participants having in excess of ten years of experience across both the public and private higher education sectors. The credentials of the participants who agreed to participate in the study established the required credibility of their perspectives on the relevance of Bloom's taxonomy across multiple fields of study and levels of cognitive complexity.

The section that follows presents the findings from both the qualification dataset content analysis and the thematic analysis of the semi-structured interviews with the education professionals.

4.3. PRESENTATION OF EMPIRICAL FINDINGS

The research methodology and empirical findings explored the experiences of education professionals regarding their perceived relevance of Bloom's taxonomy in the online distance learning environment in South Africa, within which they operate. This exploration into the subjective realities of participants aligns with the interpretivist paradigm, with the identified themes such as the perceived cognitive rigidity, the lack of contextual relevance in a digital environment, and the varied interpretations of action verbs associated with Bloom's taxonomy, speaking directly to socially constructed meaning rather than objective measurements. The themes identified during the thematic analysis reflected the shared interpretation and experiences of the participants on Bloom's taxonomy within the South African ODL space and regulatory environment, rather than factual statements that could be confirmed or denied. This focus on subjective perspectives confirms the suitability of the interpretivist approach in this study for generating rich, contextual insight into the relevance of Bloom's taxonomy as a curriculum design tool for creating and evaluating exit level outcomes.

In addition, the research design and the results of both the content analysis and the thematic analysis align closely with the chosen social-constructivist theoretical framework. Sharing the content analysis findings on semantic complexity and verb frequencies with the interview participants was done to stimulate in-depth dialogue and social interaction. This was done to aid the framing of the subsequent discussions on the actual use of Bloom's taxonomy in accredited qualifications. This is a process that aligns with Vygotsky's theories around the development of shared understanding in the creation of collective meaning.

Offering the ability to education professionals to reflect on the implications of Bloom's taxonomy within the online environment, and then to investigate the potential links and connections between their responses, is also reminiscent of Siemens' perspective of learning.

In such instances, “online learning depends on the fluid, dynamic interchange of ideas between students and facilitator” (Krueger, Porter, & Burke, 1998:206), or in this case between the interviewer and interviewee.

The empirical findings of the research are presented in two sections below, with the first section addressing both the frequency of verbs used in exit level outcomes and the semantic complexity caused by multiple verb usage in exit level outcomes across the qualification dataset. The findings of this analysis were shared with the education professionals during the semi-structured interviews. The aim of this was to provide the contextual background in which further discussions on the relevance and use of Bloom’s taxonomy in shaping learning outcomes in an online, digital learning environment were framed.

The second section addresses the thematic analysis of the seven semi-structured interviews with the education professionals themselves, focusing on five overarching themes covering the current use and perceived relevance of Bloom’s Revised Taxonomy, its perceived impact on programme accreditation processes, emerging perspectives on digital taxonomies, and participant feedback on the content analysis of exit level outcomes.

4.3.1. Findings of the Document Analysis (Qualification Exit level Outcomes)

4.3.1.1. Semantic Complexity of Exit level Outcomes

As previously defined in Section 1.11. Clarification of Key Concepts, semantic complexity refers to the extent to which a sentence or statement allows multiple interpretations. Within the context of learning outcome development, this concept highlights that each verb should represent one clear, observable action or competency to ensure consistent understanding and assessment. If the learning outcome includes additional verbs, multiple actions could be presented, leading to uncertainty about which action must be observed to ensure the level of competency is achieved (Vedaraman & Stapleton, 2013).

For this research, the semantic complexity of exit level outcomes was measured according to whether one, two, three or more verbs were used in the formulation of the exit level outcome, with the higher the number of verbs utilised in a single statement indicating an exit level outcome of increasing semantic complexity.

Table 4.2 illustrates the findings of semantic complexity in relation to verb usage across the nine different qualification types.

Table 4.2. Analysis of Qualification Exit Level Outcomes – Semantic Complexity

Qualification Type	NQF Level	Total No. of ELOs	Semantic Complexity		
			No. of exit level outcomes with x1 verb	No. of exit level outcomes with x2 verbs	No. of exit level outcomes with x3 or more verbs
Higher Certificate	05	140	30	69	41
Advanced Certificate	06	32	10	17	5
Diploma	06	207	102	65	40
Advanced Diploma	07	159	57	55	47
Bachelor's Degree	07	418	142	141	135
Bachelor's Honours Degree	08	348	132	91	125
Postgraduate Diploma	08	202	70	61	71
Master's Degree	09	543	200	186	157
Doctorate	10	185	100	56	29

Source: Student's own

It was interesting to note that across all the qualification types, more than 50% of all exit level outcomes were formulated using more than two verbs, which demonstrates a significant deviation away from the theoretical 'best practice' of designing exit level outcomes with a single action verb and/or concept to ensure easily identifiable competency areas with mutually exclusive assessment measurables (Vedaraman & Stapleton, 2013).

4.3.1.2. Frequency and Distribution of Action Verbs

When investigating the frequency of verbs used in the design of exit level outcomes, the top ten most frequently used verbs per qualification type were identified and recorded for further comment by the education professionals. Table 4.3 illustrates the frequency tables of the data set.

Table 4.3. Analysis of Qualification Exit Level Outcomes – Verb Frequency

Qualification Type		Higher Certificate	
NQF Level	05	No. of Qualifications	22
Top Ten Verbs Based on Frequency			
01.	Demonstrate		57
02.	Understand		45
03.	Apply		23
04.	Knowledge		21
05.	Communicate		16
06.	Use		13
07.	Evaluate		8
08.	Identify		6
09.	Manage		6
10.	Select		5
Top Ten Verbs as a %			68.7%
Total Number of Verbs			291
Total Number of ELO			140

Qualification Type		Advanced Certificate	
NQF Level	06	No of Qualifications	05
Top Ten Verbs Based on Frequency			
01.	Demonstrate		11
02.	Understand		10
03.	Knowledge		9
04.	Apply		7
05.	Provide		4
06.	Support		4
07.	Analyse		2
08.	Prepare		2
09.	Advise		1
10.	Calculate		1
Top Ten Verbs as a %			86.4%
Total Number of Verbs			59
Total Number of ELO			32

Qualification Type		Diploma	
NQF Level	06	No. of Qualifications	35
Top Ten Verbs Based on Frequency			
01.	Demonstrate		56
02.	Apply		39
03.	Knowledge of		35
04.	Understand		30
05.	Evaluate		16
06.	Identify		14
07.	Manage		12
08.	Develop		9
09.	Perform		8
10.	Analyse		7
Top Ten Verbs as a %			64.2%
Total Number of Verbs			352
Total Number of ELO			207

Qualification Type		Advanced Diploma	
NQF Level	07	No of Qualifications	25
Top Ten Verbs Based on Frequency			
01.	Demonstrate		48
02.	Apply		39
03.	Understand		29
04.	Knowledge		13
05.	Develop		12
06.	Use		10
07.	Evaluate		9
08.	Plan		8
09.	Communicate		7
10.	Manage		7
Top Ten Verbs as a %			59.1%
Total Number of Verbs			308
Total Number of ELO			159

Qualification Type		Bachelor Degree	
NQF Level	07	No. of Qualifications	61
Top Ten Verbs Based on Frequency			
01.	Demonstrate		127
02.	Apply		97
03.	Understand		86
04.	Evaluate		38
05.	Knowledge		38
06.	Analyse		30
07.	Communicate		29
08.	Use		24
09.	Identify		22
10.	Develop		21
Top Ten Verbs as a %			61.8%
Total Number of Verbs			829
Total Number of ELO			418

Qualification Type		Honours Degree	
NQF Level	08	No of Qualifications	54
Top Ten Verbs Based on Frequency			
01.	Demonstrate		81
02.	Understand		49
03.	Apply		42
04.	Analyse		37
05.	Identify		34
06.	Communicate		32
07.	Knowledge		31
08.	Develop		24
09.	Evaluate		24
10.	Use		20
Top Ten Verbs as a %			54.3%
Total Number of Verbs			689
Total Number of ELO			348

Qualification Type		Postgraduate Diploma	
NQF Level	08	No. of Qualifications	35
Top Ten Verbs Based on Frequency			
01.	Demonstrate		49
02.	Apply		41
03.	Understand		23
04.	Develop		21
05.	Analyse		18
06.	Identify		17
07.	Knowledge		14
08.	Address		13
09.	Manage		12
10.	Evaluate		11
Top Ten Verbs as a %			54.1%
Total Number of Verbs			405
Total Number of ELO			202

Qualification Type		Master's Degree	
NQF Level	09	No of Qualifications	95
Top Ten Verbs Based on Frequency			
01.	Demonstrate		163
02.	Apply		74
03.	Knowledge of		67
04.	Understand		52
05.	Analyse		48
06.	Evaluate		41
07.	Communicate		38
08.	Identify		35
09.	Conduct		29
10.	Design		29
Top Ten Verbs as a %			55.3%
Total Number of Verbs			1042
Total Number of ELO			543

Qualification Type		Doctorate	
NQF Level	10	No. of Qualifications	30
Top Ten Verbs Based on Frequency			
01.	Demonstrate		39
02.	Analyse		20
03.	Understanding		17
04.	Evaluate		16
05.	Contribute		15
06.	Apply		14
07.	Conduct		11
08.	Manage		10
09.	Collect		9
10.	Design		9
Top Ten Verbs as a %			54.4%
Total Number of Verbs			294
Total Number of ELO			185

Source: Student's own

The most frequently used verbs did not appear to be aligned correctly to the corresponding NQF level of the qualification, and often appeared across multiple qualification types and NQF levels, further attesting to the potential non-alignment with Bloom's taxonomy. For example, the ability to' demonstrate an understanding', which is categorised as a dual action verb, can be categorised as non-observable or 'lower-order' cognitive processes according to Bloom's Revised Taxonomy. When reviewing the data to present to the educational professionals for further discussion, it can be clearly seen that both 'demonstrate' and 'understanding' appear within the top five most frequent verbs used across all HEQSF-aligned qualifications, ranging from NQF level 5-10. This occurrence speaks to the claim that the use of Bloom's revised taxonomy action verbs is often misaligned with the NQF level of the qualifications, potentially as a result of a lack of official or formalised training on how to implement the verbs accordingly.

This finding aligned with one of the criticisms levelled against Bloom's taxonomy in research conducted by Das, Mandal and Basu in 2021, where it was argued that multiple verbs often exist at multiple NQF levels, leading to the misinterpretation of action verbs when drafting learning objectives and assessment criteria. The lack of official documentation to guide the use of Bloom's taxonomy, as claimed by Dos Reis in research conducted in 2022, further supports the findings that curriculum designers and/or education professionals often rely on their variable experiential learning in both the design and evaluation of qualifications using Bloom's to align learning outcomes to the correct level of cognitive complexity across qualification types. This lack of standardisation has the potential to confuse both student and educator alike regarding the expected competencies to be displayed at each NQF level.

4.3.2. Findings of the Thematic Analysis (Semi-structured Interviews)

As stated in Chapter 3, Section 3.4.3. Data Processing, the questions used in the interview schedule, and identified for the thematic analysis (following the Braun and Clark framework) were identified as:

- Current use of Bloom's Revised Taxonomy
  How are you or your institution currently implementing Bloom's taxonomy in the design or review of exit level outcomes?
- Perceived relevance of Bloom's Revised Taxonomy
  What do you consider to be the benefits or limitations of the continued use of the taxonomy in an online, digital learning environment?
- Impact of Bloom's Revised Taxonomy on programme accreditation,
  How much of an influence do you feel the taxonomy has on the CHE and SAQA accreditation process of new qualification designs?
- Openness to digital taxonomies
  Have you ever considered adopting a digital taxonomy to better align with technological advancements – If so, which taxonomies have you considered?
- Features of digital taxonomies
  What technological terms, features or applications would make a difference to your curriculum designs and why?
- Comparison of Digital taxonomies
  Do you think a digital taxonomy should replace Bloom's taxonomy, or is there merely a need for a revision to accommodate technological advancements?

- Semantic complexity of Exit Level Outcomes
  What are your thoughts on using multiple verbs in exit level outcome design and its potential impact on the complexity of competency achievement?
- Frequency of action verb use
  What are your thoughts upon seeing what the top ten most frequently used action verbs per qualification type are?

These questions in the interview schedule, available in Appendix G: Summary of Thematic Analysis, were grouped into five overarching themes to assist in answering the research question. These five broad themes are:

- Theme 1: Current Use of Bloom's Revised Taxonomy
- Theme 2: Perceived Relevance of Bloom's Revised Taxonomy
- Theme 3: Impact of Bloom's Revised Taxonomy on Qualification Accreditation
- Theme 4: Perspectives on Digital Taxonomies
- Theme 5: Feedback on ELO Content Analysis

4.3.2.1. Theme 1: Current Use of Bloom's Revised Taxonomy

Whilst Bloom's taxonomy is generally recognised as a tool for the development of learning outcomes, and is frequently used in various educational settings, the manner in which it is implemented is not uniformly applied. Regardless of the shifting nature by which Bloom's taxonomy is applied, moving between a traditional application and one influenced by other contemporary frameworks, a significant theme is that of the historical precedent that Bloom's taxonomy has set in programme design.

Bloom's taxonomy is often seen as the default taxonomy used globally, with Participant 7 referring to Bloom's taxonomy as:

> "The Bible, as it were, and we would then convince ourselves to say that this is central to the design and the review of the qualifications exit level outcomes".

Despite this perception of Bloom's taxonomy as a 'traditional default' to programme design, it appears that Bloom's is increasingly viewed as requiring a supplementary framework to increase its relevance in an evolving educational environment.

Specifically in the South African regulatory environment, participants often collectively referenced the use of SAQA's level descriptors offering more value in the development of exit level outcomes when merged with Bloom's taxonomy to create more 'smart' or applicable learning outcomes, with Participant 2 claiming that:

> "No, I think we're moving away. Well, well, not completely away, but transcending I would say into now smart is becoming even more applicable than Bloom's, you know, SMART**."
>
> ** SMART – Smart | Measurable | Achievable | Relevant | Time-bound

Regardless of this perception of the need to supplement Bloom's taxonomy, it is still viewed as a useful tool for the training and development of new academic professionals in distinguishing higher-order and lower-order cognitive tasks for assessment design and evaluation purposes, with Participant 5 stating they find Bloom's taxonomy:

> "quite useful 'cause I do quite a lot of external examining and looking at papers and often. Depending on the level".

Overall, while Bloom's Revised Taxonomy retains its prominence as a foundational tool for learning outcome development and assessment design, participants in the study felt that its relevance as a standalone taxonomy would align more strongly with the needs of the South African ODL environment if it were integrated with contextually grounded frameworks such as SAQA's level descriptors or SMART criteria to ensure relevance. This finding aligns well with another criticism levelled against Bloom's taxonomy in the literature review, that the taxonomy suffers from limitations when attempting to expand its use outside of its original mandate (Section 2.4.2.5. Limitations of Bloom's Revised Taxonomy). These limitations are evident when the pedagogical approaches and technological advancements of the contextual environment are not taken into consideration (Masapanta-Carrion & Velazquez-Iturbide, 2018).

4.3.2.2. Theme 2: Perceived Relevance of Bloom's Revised Taxonomy

As stated in the previous section, Bloom's taxonomy is still held in high regard for its usefulness in guiding new academics in formulating learning outcomes and assessments. However, as a standalone tool, the education professionals in the interviews felt that Bloom's taxonomy often fails to fully meet the needs of the 4th Industrial Revolution (refer to Section 1.11 Clarification of Key Concepts), with a noticeable lack of contextual relevance, practical

application, and perceived cognitive rigidity, where it “should not be the only guide to design the curriculum for the subject” (Rahman & Manaf, 2017:251). This also aligns with Siemens’ connectivism theory that posits that learning in the modern, digital age should focus, or at least align with, network-based systems to enhance learning using the digital mediums available.

The participants shared the perception that Bloom’s taxonomy was framed within the traditional teaching environment, predating major digital and societal events (for example, pre-COVID and pre-generative artificial intelligence). As a result of advancements in technologies, Bloom’s taxonomy does not necessarily offer a clear articulation of action verb usage into the ODL space, with the result that academics who are not ‘techno-savvy’ struggle to accurately interpret how traditional verbs translate into a digital environment.

Participant 1 described their personal experience when attempting to utilise Bloom’s taxonomy in the digital environment as follows:

> “What is the word technology literate? So, techno-savvy. So, if they would apply Bloom's technology taxonomy, now say ‘apply’, how will they interpret ‘apply’ in the technology context, because I don't have more than basic knowledge of a digital environment?”

This statement by the participant highlights their own self-awareness regarding the lack of exposure or perceived ‘comfort’ for adapting Bloom’s taxonomy to the digital environment. With emerging technologies such as generative AI and machine learning becoming a part of almost every industry, these technological advancements have become practical imperatives across fields rather than in niche information communication industries, further highlighting the need for Bloom’s taxonomy to accommodate these changes in learning outcomes designs. These nuanced interpretations of Bloom’s taxonomy in an evolving, ODL environment require specialised training to ensure accuracy and consistency in application. Within the South African landscape, this can become even more convoluted when one takes into consideration both the number of official languages and the digital divide in technology exposure, with Participant 3 stating that:

> “I think that some of these or maybe all of Bloom’s taxonomy, you can find that it is kind of preventative towards student success. And especially from the African point of view, in terms of the home language, you can find that it restricts certain students, especially those who are coming from rural areas”.

The idea that Bloom's taxonomy has the potential to restrict certain students based upon their demographics was further elaborated upon with participants sharing the perception that Bloom's taxonomy, in its current form, imposes a cognitive rigidity by prescribing a single progression path for learning (Soozandehfar & Adeli, 2016) without taking into consideration either cultural differences in learning approaches (Akintolu, Dlamini & Letseka, 2022) or differentiated learning in an online environment.

It was proposed that Bloom's taxonomy, as a tool for designing learning outcomes, can create a potential obstacle in a progressive ODL environment, not due to the taxonomy itself but rather through the manner in which it has been implemented historically, with Participant 7 explaining that:

> "It's a little bit of pride because people just think, but I worked on this thing for so long. You know, we've always been, we've always been doing it this way. It does not mean that the way was incorrect. That way has served its purpose."

Whilst the potential limitations of Bloom's taxonomy were highlighted within the context of the South African online distance learning environment, all the participants shared the same perception that Bloom's taxonomy still holds a fundamental role in programme accreditation in relation to South Africa's higher education regulatory environment.

Whilst retaining its status as a foundational and globally recognised instrument (often referred to by participants as "the Bible" of programme design and central to qualification accreditation in the South African higher education sector), Bloom's Taxonomy is increasingly viewed as requiring supplementary frameworks. This necessity for supplementary integration with contextually grounded criteria, such as SAQA's level descriptors or the SMART framework, is advocated for by education professionals to enhance its contemporary relevance amidst the evolving technological environment of the 4th Industrial Revolution.

4.3.2.3. Theme 3: Impact of Bloom's Revised Taxonomy on Qualification Accreditation

When exploring the impact of Bloom's taxonomy as a critical factor in the accreditation of new qualifications, the perspectives of the education professionals interviewed were that the evaluation of the taxonomy focused primarily on mechanical processing of outcome verbs, rather than a deep, consistent engagement with the taxonomy's underlying cognitive principles. The concept of 'mechanical processing' of Bloom's taxonomy was further explained as a fixation on action verbs by accreditation bodies, reducing the application of the taxonomy

to a mere administrative layer. This viewpoint was epitomised by Participant 7's statement that:

> "I firmly believe that the majority of applications became quite mechanical in their administrative and in its academic sort of processing."

Interestingly, another aspect that presented itself was that, although the accreditation bodies have a perceived fixation on the administrative application of action verbs, the accreditation evaluators often do not apply the 'rules of application' consistently. This came to the forefront of discussions when reviewing the top ten verbs appearing in exit level outcomes from the document analysis of the dataset from the SAQA database, with one participant noting that action verbs were often not aligned to the NQF level of the qualification. Participant 1 commented that:

> "But then SAQA, that is, they are the owners of the exit level outcomes for registration, the level descriptors for registration purposes. They don't pick it up."

This level of discrepancy and potential lack of alignment may stem from the accreditation system of peer reviewers required for qualification accreditation. The peer reviewers are subject matter experts in the corresponding field, but are often not curriculum experts who focus on the technical details of the verb selection rather than contextual application. This claim is supported by Soozandehfar and Adeli (2016), who state that "Bloom's Taxonomy is often misinterpreted and misapplied by educators" (Soozandehfar & Adeli, 2016:5).

Key limitations include Bloom's perceived cognitive rigidity, a noticeable lack of clear articulation regarding the translation of traditional action verbs into the ODL space, and its potential to act as a measure preventing student success for those impacted by the digital divide. Furthermore, the impact of the taxonomy on programme accreditation is characterised by a mechanical processing of outcome verbs, a fixation that has been observed to result in outcome loading and a pervasive ambiguity of verb usage across several NQF levels, thus raising significant questions regarding the genuine scaffolding and the differentiation of cognitive complexity.

4.3.2.4. Theme 4: Perspectives on Digital Taxonomies

When raising the potential application of more contemporary 'digital taxonomies', the responses of the participants were reviewed regarding their openness to the application of digital taxonomies, the potential features that may offer value, and the potential of such

contemporary taxonomies to replace Bloom's Taxonomy in qualification and programme design. Refer to Section 2.4.3. Application of Digital Taxonomies.

There was a consensus amongst the participants that there is a need to supplement Bloom's taxonomy, and all participants shared the perspective that their respective institutions and/or colleagues were interested in more contemporary digital taxonomies. This requirement to update or supplement Bloom's taxonomy with digital verbs or competencies is supported by Akintolu, Dlamini, and Letseka (2022) when they state that "for professional educators to achieve the best results and add value for the learners, there is a need to follow the application of Bloom's Taxonomy and incorporate technology" (Akintolu et.al., 2022:46). However, it appears that the desire to explore the uses of digital taxonomies was perceived as merely a current trend aligned with the emergence of artificial intelligence into mainstream education institutions, with Participant 6 commenting that:

> "Everyone is now saying, oh, we need to look at the digital taxonomy because they can't move past Bloom's taxonomy."

This statement could reflect the perceived reluctance to "move past Bloom's taxonomy" due to the reliance on Bloom's taxonomy as a fundamental feature of qualification accreditation in the South African higher education regulatory landscape. Rather than speaking to any specific digital taxonomy, the general opinion was that the existing Bloom's taxonomy merely needed to adopt a more flexible approach to the interpretation or allocation of action verbs to specific NQF levels, with a stronger focus on contextual relevance when formulating learning outcomes. The reluctance to move away from Bloom's taxonomy entirely was centred around the education professionals' lack of experience in the digital learning environment, with education professionals defaulting to the traditional Bloom's taxonomy to ensure compliance in the qualification accreditation process. When asked the degree to which institutions were engaging with digital taxonomies, Participant 2 noted that:

> "We've only started to do that now. Yes, only just begun because we were so, you know, old school, I should say, where everybody was using Blooms and because we use the CHE guidelines so closely in applying for these programs. But yeah, we've only started to incorporate that now, but very limited. Very, very limited."

When the topic of potential features of digital taxonomies was raised, the discussions tended to focus on two main topics, namely the application of verbs in a digital environment and the ethical use of technology for application and innovation, with Participant 2 noting:

> “We would speak about verbs like create or innovate. Now that can be thought of in terms of the way graduates must not just now understand technology, but now also be able to design, adapt and yeah, innovate."

From the discussion, it appears that there was a limited desire or need to incorporate technologically advanced features from a digital taxonomy and rather a shift in the manner in which Bloom’s taxonomy is applied in the digital environment. This perspective needed further unpacking as tools such as the use of online simulations or digital case studies (software applications rather than elements of a digital taxonomy) showed more relevance in preparing students for a technologically aligned workplace. The use of existing action verbs from Bloom’s taxonomy was simply adapted to accommodate the use of online learning artefacts. This was justified by the idea that the way people learn has not changed, but rather the medium of learning from physical space to digital, online environments.

Participant 7, who originated from an information technology (IT) institution, emphasised the need to interpret the use of different action verbs from the perspective of digital inclusion as a means of addressing the digital divide that exists within the South African socio-economic landscape, stating that:

> "Things like employability started making a feature, and then you started seeing things like simulations happening for certain programs, digital case studies."

The use of such online simulations has moved beyond the scope of IT-related fields across a range of fields of study, where the importance of action verb selection now has to work at achieving the learning objectives of both the field of study and the level of digital literacy for all students.

As stated in the previous paragraphs, there was a strong consensus between all the participants that the complete replacement of Bloom’s Taxonomy with a digital taxonomy was not only unnecessary, but also considered a risky endeavour considering the state of change within the South African higher education regulatory environment with the adoption of the new Quality Assurance Framework (QAF) and various Higher Education Practice Standards (HEPS). One proposal put forward by Participant 3 was that the use of digital taxonomies or revised digital action verbs would be more beneficial at the postgraduate levels of study, where the students’ fundamental academic literacy skills have already been developed in their undergraduate qualifications.

> "I think it will be beneficial [digital taxonomies], but at the higher NQF level for now, so that you know we can get used to the digital ones before we can even move to the lower NQF level."

The emphasis was placed on the concept of transformation, supplementation or reinterpretation of the existing Bloom's taxonomy rather than a replacement thereof.

These theoretical discussions on the relevance of Bloom's taxonomy and the potential adoption of digital taxonomies then shifted to a brief review of the results of the content analysis conducted on the qualification dataset from the SAQA online database (which was shared with the participants) to see how these findings aligned with the earlier discussions. Questions addressing the results of the content analysis can be seen in the interview schedule in Appendix E under question section 4.

4.3.2.5. Theme 5: Feedback on Exit Level Outcome (ELO) Content Analysis

When examining the semantic complexity of exit level outcomes, more specifically, the ideal number of action verbs allocated per learning outcome, the perspectives of the participants were divided equally. There were those participants who felt that certain action verbs could be 'paired' to create a practically assessable learning outcome, such as the use of 'select and apply' or 'apply and justify'. Other participants felt that learning outcomes with more than a single action verb would result in 'outcome loading', with Participant 1 stating:

> "If you write an outcome, you will not put in two or three verbs because then it becomes so loaded. How are you going to test that? Because in your [Assessment Criteria] ACs, then you end up with a lot of associated assessment criteria at the end because you have to unpack that whole thing in how you're going to assess".

As a result of outcome loading, there is the potential to lose focus on what the learning outcome is intended to achieve, with the risk of redundancy occurring merely to achieve perceived compliance with accreditation criteria. This aligns with those issues highlighted in Section 2.4.2.3. Utilisation of Bloom's Taxonomy, specifically the areas that note the areas of concern over the use of Bloom's taxonomy, where it "should not be the only guide to design the curriculum for the subject" (Rahman & Manaf, 2017:251). The lack of formal training in the utilisation of Bloom's taxonomy by education professionals can lead to the misinterpretation, misalignment and overuse of action verbs.

The results of the content analysis on the dataset available in Section 4.3.1.1. Semantic Complexity of Exit level Outcomes illustrated that across the different NQF qualification types analysed, more than 50% of exit level outcomes contained two or more verbs, raising the question of how focused these learning outcomes really were. When the findings were presented to the participants, Participant 2 commented that:

> "I find that where you would increase it [action verbs] and go to two and even sometimes three, then the actual focus of it is lost."

The discussion on the intended focus of learning outcomes then shifted to the findings of the content analysis pertaining to the most frequently used verbs across qualification types. The result of the analysis showed pervasive ambiguity in meaning and excessive repetitiveness of verbs across different NQF levels, such as was witnessed in the use of the action verbs 'demonstrate' and 'understanding' (refer to Section 4.3.1.2. Frequency and Distribution of Action Verbs). The meaning and suitability of verbs are seen as heavily dependent on the individual user's contextual perception and history, creating vast semantic differences.

The repetitiveness of verbs across qualification types and NQF levels illustrated a clear misalignment of action verbs to the appropriate cognitive level, as per Bloom's taxonomy. This finding raised concerns about the accreditation process being fundamentally flawed in its ability to enforce genuine scaffolding and differentiate cognitive complexity. Participant 4 pointed out that if the same action verb can be used across multiple levels of cognitive complexity, how does one actually determine the level of skills that must be demonstrated to determine competency?

> "So how do the people actually differentiate? How do they scaffold? If you find the same verbs at all the NQF levels, then it means that whether we are actually assessing or teaching an NQF thing is exactly the same."

The results from these themes provide valuable insight into answering the research question surrounding the perceived relevance of Bloom's Taxonomy for technologically aligned pedagogies, specifically in the context of South Africa's Open Distance Learning Environment.

4.4. CONCLUSION

Chapter 4 presented and interpreted the findings of the qualitative research, gathered and analysed using the methodology described in the third chapter. This involved the content analysis of accredited qualifications extracted from the SAQA online database, and the

thematic analysis of semi-structured interviews with higher education professionals actively working within the public and private South African higher education sector.

The main findings from the research uncovered that, whilst Bloom's taxonomy still holds prominence as the foundational design tool for qualification exit level outcome designs and subsequent accreditation with the South African regulatory bodies, its relevance as a standalone taxonomy is slowly diminishing as the application of technology becomes more prominent across various fields of study. When the results of the content analysis were shared with the education professionals to encourage in-depth conversations, it was determined that qualifications were frequently being accredited with semantically complex exit level outcomes (more than 50% of statements containing more than two verbs), indicating a trend for 'outcome loading' that has the potential to complicate the ability to accurately assess student competency levels. This fact, together with the misalignment of action verbs to the appropriate qualification NQF level, as seen through the determination of the top ten most frequently used verbs across qualification types, further aligns with the education professionals' perceptions.

These views hold that the regulatory bodies have reduced the application of Bloom's taxonomy to a mechanical, administrative requirement for accreditation. Within the context of the South African ODL environment, the education professionals described Bloom's taxonomy as often suffering from 'cognitive rigidity', assuming that all students learn the same way and ignoring the contextual influence of specific fields of study. The consensus amongst the interview participants was that Bloom's taxonomy would never be entirely replaced, but rather needs to undergo transformation, supplementation, or reinterpretation to ensure that the taxonomy maintains its relevance in a technologically advanced 4IR environment. The benefits of digital taxonomies were discussed, although there was a clear reluctance from the education professional to adopt any of the more contemporary taxonomies due to the lack of longitudinal evidence of effectiveness and their inability to align with South Africa's higher educational regulatory bodies.

In summary, the perceived relevance of Bloom's taxonomy is split according to whether it is viewed from its application with the current South African regulatory environment for accreditation purposes, or a future focus on ensuring relevance with emerging technologies in an advancing global economy. In the current context of qualification accreditation in South Africa, Bloom's taxonomy is still highly relevant as it forms a fundamental element for accreditation. However, as a standalone taxonomy for qualification exit level outcome design, participants perceive Bloom's Taxonomy as quickly losing its relevance due to its limitations in application in both the ODL environment and across various fields of study that are highly influenced by generative artificial intelligence and advanced technology.

In the following Chapter 5, summarised findings are presented to provide a context for the conclusions and recommendations on exit level designs and taxonomy implementations. The chapter also addresses the limitations of the study and suggestions for future research.

CHAPTER 5:
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION

From an overarching perspective, the study aimed to investigate whether education professionals view Bloom's Taxonomy as still holding relevance within the context of South Africa's open distance learning environment, given the fast pace at which technology is shaping various industries, including the education sector. Having presented the research problem in Chapter 1, the review of relevant literature in Chapter 2, the research design and methodology in Chapter 3, and the findings of the document analysis and the semi-structured interviews in Chapter 4, this final chapter offers a summarised account of how all the findings integrate to respond to the defined research problem.

The chapter concludes by outlining the possible limitations of the study and offers recommendations for education professionals and future researchers on the relevance of Bloom's taxonomy in shaping learning outcomes as an integral aspect of higher education qualification accreditation in South Africa.

5.2. SUMMARY OF THE LITERATURE REVIEW

The literature review in the second chapter framed the study in the theoretical framework of both Vygotsky's 1978 Social Constructivism and Siemens' 2005 Connectivist Theory (Section 2.2. Theoretical Framework). The importance of social learning through the benefits of utilising complex digital environments and/or communities afforded to modern researchers through the use of emerging technologies was highlighted.

The COVID-19 pandemic and the forced migration of South Africa's higher education sector (in both private and public institutions) into the online distance learning environment (ODL) made the Vygotsky and Siemens frameworks ideal for the purposes of positioning the research.

The study focused on gaining data and understanding through social interaction and collaborative meaning-making, combining the content analysis of qualification exit level outcomes with thematic analysis of semi-structured interviews with education experts to investigate how Bloom's Taxonomy is currently applied and perceived amid evolving digital and pedagogical contexts.

The literature review provided the historical background for the study by briefly exploring the evolution of the South African educational landscape from 1953 to the current date of 2025 (Section 2.4.1. Development of the South African Higher Education Environment). The review touched on the central policies and regulatory bodies that govern the environment in which the study is positioned, namely the Higher Education Act 101 of 1997 (amended 2016) and the National Qualifications Framework Act 67 of 2008. Knowledge of these acts was essential to the study to understand how they address distance education and the integration of technology to widen access and improve educational outcomes.

The development of Bloom's taxonomy from its origins in 1956 to the revised version of 2001 (Section 2.4.2. Bloom's Taxonomy) was examined to highlight the function of the taxonomy as a comprehensive educational framework. Originally designed to identify varying levels of cognitive complexity as an assessment tool, to its most recent iteration as a taxonomy used in qualification accreditation in the South African Higher Education landscape, this information was essential to determine the relevance of the taxonomy within its current scope of application. While Bloom's Taxonomy remains central to the South African curriculum design and quality assurance, its traditional cognitive focus poses potential limitations in addressing the demands of contemporary pedagogies, highlighting the need for more technologically aligned frameworks that integrate social-constructivist principles with digital advances.

Finally, the literature review offered a brief introduction to various contemporary taxonomies that are currently being operationalised around the world, some a mere adaptation of Bloom's taxonomy, with others offering a more innovative perspective on how learning outcomes should be defined within the digital age (Section 2.4.3. Application of Digital Taxonomies). This section offered a glimpse into alternative taxonomies that, whilst still in the development stages, offer differing perspectives on how to evolve alongside the advancements in science and technology.

5.3. SUMMARY OF THE EMPIRICAL STUDY AND FINDINGS

The empirical research of this study, as described in Chapter 3 and applied in Chapter 4, utilised a qualitative research approach to explore the experiences and perceptions of education professionals on the relevance of Bloom's taxonomy in the South African ODL environment.

Data was first collected from the South African Qualifications Authority public database on accredited qualifications, so that a content analysis could be performed on the verbs used in the development of exit level outcomes.

The results of the content analysis showed a clear misalignment between the most common action verbs used in the formulation of exit level outcomes and the intended NQF level of the respective qualifications. These results aligned with the literature review that stated that the overlapping of action verbs occurs across NQF levels. In addition, the lack of official guiding documentation in South Africa had the potential for creating unwanted confusion between both student and teacher alike, with “a distinct lack of alignment between what is taught and what and how learning is assessed” (dos Reis, et.al., 2022:39). These findings were shared with the participants during the semi-structured interviews to provide a rich source of data upon which the conversations could be founded.

A purposive sample of participants was collected or obtained. Seven highly experienced education professionals from across both the private and public higher education sectors participated in the semi-structured interviews. This was followed by a thematic analysis conducted upon the transcripts utilising Braun and Clarke’s Braun and Clarke’s six-phase framework, as described in Chapter 1's Section 1.7.2.3. Data Analysis. The results of the thematic analysis, fully expanded upon in Chapter 4, Section 3: Presentation of Empirical Findings, are summarised below:

5.3.1. Theme 1: Current Use of Bloom's Revised Taxonomy

Bloom’s Revised Taxonomy remains a foundational tool used around the world (Momen et at., 2022), including in South African higher education, particularly in qualification design and learning outcome development. However, its application and evaluation are not standardised within the South African regulatory environment, with many of the interviewed education professionals viewing it as a traditional default or “the Bible” for qualification design. Participants from the semi-structured interview highlighted that while Bloom’s taxonomy continues to provide a helpful framework for distinguishing the complexity of cognitive tasks, especially for training new academic staff and assessment design, as a standalone taxonomy, it will need to be supplemented with another framework to maintain its relevancy in a technology-evolving context.

5.3.2. Theme 2: Perceived Relevance of Bloom's Revised Taxonomy

The results of Theme 2 showed significant overlap with the outcomes of Theme 1, with many participants pointing out the limitations of Bloom’s taxonomy when viewed within the context of the 4th (and future 5th) Industrial Revolution, most notably the focus on individual cognitive development with the exclusion of social or online learning experiences.

Bloom's taxonomy was viewed as a 'rigid' framework that had no clear translatability into the online or digital learning environment, often being open to interpretation by both educators and regulatory evaluators.

It was also pointed out that within the culturally and linguistically diverse landscape of South Africa, the interpretation of verbs or cognitive complexity levels was open to subjective interpretation due to the lack of official guiding documentation. Despite these limitations, Bloom's Taxonomy was still viewed as vital within the South African Higher Education regulatory environment, predominantly due to the lack of viable alternatives.

5.3.3. Theme 3: Impact of Bloom's Revised Taxonomy on Qualification Accreditation

In light of the outcomes identified in Themes 1 and 2, Bloom's Taxonomy's application within the South African qualification accreditation seems to have devolved to one of a purely administrative or procedural nature, rather than as a taxonomy for the identification of cognitive complexity. Due to the peer review process of qualification accreditation, and the already determined lack of standardised application due to limited official guiding documents, at the level of accreditation, Bloom's taxonomy is used in a 'mechanical' fashion, resulting in misalignment of verbs with NQF levels and issues with cognitive scaffolding. The current process often results in the accreditation of qualifications with vague learning outcomes that do not reflect accurate levels of cognitive differentiation, thereby undermining the learning and assessment standardisation intention behind the original design of Bloom's taxonomy as a whole.

5.3.4. Theme 4: Perspectives on Digital Taxonomies

There was a broad consensus amongst the interview participants that whilst digital taxonomies held merit within the technology-evolving educational landscape, the efficacy of their implementation still had to be determined and accepted by the regulatory bodies prior to the adoption by institutions or individual education professionals. Given the current regulatory landscape of South Africa, the complete replacement of Bloom's taxonomy was not deemed as feasible; however, the potential supplementation of the taxonomy with already existing frameworks, such as the SMART framework or SAQA's own published 'Level Descriptors', has the potential to provide the contextual information that the standalone Bloom's taxonomy is perceived to be lacking. Given time, the inclusion of Digital Taxonomies might be feasible for postgraduate studies, where the foundational academic skills have already been developed, and the focus is then on creating or synergising information within a specific field of study.

5.3.5. Theme 5: Feedback on Exit Level Outcome (ELO) Content Analysis

The results of the content analysis showed that more than half of all the exit level outcomes contained two or more verbs, potentially leading to confusion regarding assessability or the diluting of outcome purpose. Interview participants expressed mixed views upon reviewing the results of the content analysis, with some stating that two verbs per exit level learning outcome were acceptable, provided that the verbs produced a single assessable event or output to determine the level of student competence. Additionally, the frequent use of the same verbs across multiple NQF levels created ambiguity regarding the level of expected complexity, making it difficult to scaffold content or to distinguish the skill competency levels of students accurately.

The combined outcomes of these five themes directly address the research problem defined by this study, along with sub-problems as described in Chapter 1, Section 1.4: Research Question, in the section to follow.

5.4. RESEARCH CONCLUSIONS

The primary aim of this study was to determine the perceived relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment. This section addresses the research questions posed in Chapter 1, Section 1.4: Research Question. Table 5.1 presents a summary of the findings across the four sub-questions related to the main research question.

Table 5.1. Responses to Research Sub-Questions

Sub-Questions	Findings
1. At what level of semantic complexity are education professionals designing their exit level outcomes for accredited qualifications?	Based upon the content analysis of the dataset, education professionals are designing semantically complex exit level outcomes, with more than 50% of learning outcomes containing two or more action verbs, indicating a tendency toward complex or "outcome loading" learning outcomes. This raises concerns about the loss of focus and redundancy in achieving accreditation compliance. The use of multiple verbs per outcome often creates challenges in assessment clarity and cognitive scaffolding. Consequently, there is debate about the practical assessability and focus of these compounded learning outcomes.

Sub-Questions	Findings
2. How might the use of specific action verbs influence the effectiveness of technologically aligned teaching strategies in open distance learning contexts?	Action verbs selected at the appropriate NQF level, aligned with the desired level of cognitive complexity and digital learning activities, aid in facilitating accurate assessment and meaningful engagement. The use of vague or repetitive verbs merely to gain qualification accreditation status can obscure the intended learning and obstruct the design of effective, technology-integrated assessments. Therefore, accuracy in action verb selection is essential to support both digital literacy development and contextual relevance within ODL environments.
3. What are the perspectives of education professionals on using Bloom's revised taxonomy versus adopting Digital taxonomies in qualification design for the 4th industrial revolution?	Education professionals regard Bloom's Revised Taxonomy as a foundational yet increasingly limited framework for qualification design in the 4th Industrial Revolution. While it remains essential for ensuring regulatory compliance and academic consistency, participants emphasised its lack of contextual and technological relevance in modern digital learning environments. There was consensus that Bloom's taxonomy should be supplemented rather than replaced, through integration with frameworks such as SAQA's level descriptors, SMART criteria, or emerging digital taxonomies.
4. What recommendations can be made to enhance the relevance and application of Bloom's Revised Taxonomy in a digitally-focused curriculum design?	Bloom's Revised Taxonomy should be supplemented with contextual frameworks such as SAQA's level descriptors and SMART criteria to ensure relevance in digital and ODL environments. Education professionals require formal training to interpret and apply action verbs effectively within technology-mediated contexts, reducing mechanical or inconsistent application. Bloom's taxonomy should be adapted to accommodate digital competencies, ethical technology use, and culturally diverse learning approaches.

Source: Student's own

5.4.1. Response to Main Research Question

This section evaluates the findings of the research in direct relation to the main research question of the study, namely: 'What is the relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment?'. When examining the findings of the research and its applicability towards the main research question, it can be seen that the findings can be framed within two inherent contexts of the research question itself, namely, the relevance of Bloom's taxonomy as a pedagogical tool in ODL, and the relevance of Bloom's taxonomy in the South African regulatory environment, regardless of technological status or mode of provision.

5.4.1.1. Technologically-aligned Pedagogies in ODL

The standalone application of Bloom's taxonomy as an educational tool for the design of learning outcomes in the online distance learning environment is deemed as insufficient and suffering from cognitive rigidity when addressing the needs of the 4th Industrial Revolution. This is potentially a result of the learning theories that were predominantly used at the time of Bloom's taxonomy's creation, most notably cognitivism and behaviourism. The modern ODL environment encourages collaborative or group-based learning and interactivity, which is aligned with social-constructivist and connectivist learning theories. Learning in the pre-COVID-19 landscape was predominantly 'localised' or physical/contact learning, where the focus was on the individual. As higher educational institutions have migrated to online learning management systems (LMS), learning has now taken on a global or digital aspect where the learning group or society is now the focal point.

The findings from the interviews with the education professionals found that they perceive Bloom's taxonomy as not offering clear articulation for action verb use in the ODL environment, often causing difficulty for those education professionals who lack the necessary competence or confidence to engage with the digital space. The overarching theme that presented itself was that, rather than full replacement, Bloom's taxonomy requires transformation, supplementation, or reinterpretation through the merging of SAQA's level descriptors or other relevant frameworks (for example, the SMART framework) to stay relevant in an evolving ODL landscape. Expanding on this concept to articulation out of higher education and into the workplace, if qualification exit level outcomes are not using the action verbs or terminologies utilised in technologically-aligned workplaces, then there will be a skills gap between the competencies achieved during studies and the expectations of industry.

5.4.1.2. South African Higher Education Regulatory Environment

When exploring the relevance of Bloom's taxonomy within the South African context, Bloom's taxonomy is still viewed as a foundational design tool, or the 'bible' that is essential for the successful accreditation of qualifications and programmes with the relevant regulatory bodies. Even though the application of Bloom's taxonomy as an element of accreditation evaluation was regularly critiqued as following a mechanical or administrative process, often lacking in consistency, its use was still seen as crucial for achieving regulatory compliance. Even though the participants of the interviews raised concerns about the current manner in which Bloom's taxonomy is implemented as an evaluation tool by regulatory bodies, with questions raised about the current system's capacity to enforce genuine scaffolding or differentiate cognitive complexity, Bloom's taxonomy is still viewed as relevant for the purposes of qualification accreditation.

5.5. LIMITATIONS OF THE STUDY

While the study provides valuable insights into the relevance of Bloom's taxonomy in the South African ODL landscape, the following limitations are acknowledged:

Sample Size: The study relied on a qualitative approach, utilising purpose sampling of only seven education professionals. Whilst this methodology provided deep insight, the findings cannot be generalised to all higher education institutions in South Africa, given that the South African Regulatory environment is in a current state of flux, with many institutions requesting a hybrid or blended approach of delivery for the selected mode of provision for their qualifications. This hybrid or blended approach may impact the manner in which the exit level outcomes of qualifications are designed, using the action verbs from Bloom's revised taxonomy to specifically address the outcomes depending on their anticipated mode of provision.

Contextual Specificity: The research was conducted within the specific regulatory context of the South African Higher Education landscape; hence, the findings relate specifically to the South African environment. Certain elements of the research can be expanded upon for future international studies; however, the regulatory landscape of South Africa must be taken into consideration, as this would have shaped the experiences and perspectives of the education professionals

Subjectivity: As with all qualitative research, the information gathered is based on the perceptions and lived experiences of the participants, which are influenced by their individual levels of digital literacy and years of experience. During the semi-structured interviews, some

of the more senior education professionals openly commented upon their lack of experience with, and confidence in using, online distance learning technologies.

5.6. RECOMMENDATIONS

The following recommendations originate from the research into the perceived relevance of Bloom's Taxonomy within the South African Higher Education landscape.

Whilst Bloom's taxonomy is seen as the default approach to the design of exit-level outcomes purely to meet the requirements of the regulatory bodies' perceived 'mechanical and administrative' approach to learning outcomes evaluation, this status quo can only be maintained for a limited time period. As technology integrates with more fields of study across global economies, it will only be a matter of time before educational professionals around the world start to acknowledge the limitations of following the traditional approach to implementing Bloom's taxonomy to adequately address the evolving needs of graduates in the 4IR and 5IR working environments.

Recommendations to the South African Regulatory Bodies (CHE / SAQA)

Given the current approach of the CHE and SAQA to leverage peer reviews as the mechanism for qualification evaluation, it seems logical that, as the perceptions of educational professionals adapt over the perceived relevance of Bloom's taxonomy in South Africa's online distance learning environment, the catalyst for change will occur within the regulatory bodies themselves. As a result of this, for the South African Higher Education landscape to retain its overall legitimacy within the global academic landscape, referring specifically to the online distance learning (ODL) context, the manner in which Bloom's taxonomy is applied will require reinterpretation, nationwide training on application, and a reimagining of how the accreditation of qualifications is assessed.

Recommendations to the South African Educational Professionals

As identified as a prominent theme in the findings, it is unlikely that Bloom's taxonomy will ever be entirely replaced, but will rather transform through reinterpretation or amalgamation with secondary frameworks to better contextualise the individual qualifications to meet the needs of the fields for which they are designed. Whether this 'marriage' of frameworks will occur with the existing SAQA level descriptors, another traditional framework such as SMART, or a more contemporary digital taxonomy offering a plethora of more technologically-aligned verbs remains to be seen. The results from this research indicate that, whilst Bloom's taxonomy still retains its relevance according to the current system of qualification evaluation, this level of

relevance is quickly becoming obsolete as the influence of technology, within both the modes of provision and the content of learning itself, becomes more pronounced. Therefore, for those individuals designing or evaluating South Africa's qualifications, the manner in which Bloom's taxonomy is applied will require a significant reinterpretation and alignment with international standards on online learning.

5.7. SUGGESTIONS FOR FUTURE RESEARCH

To build upon this study, three further future research areas might be considered:

Broader Comparative Studies: Due to the limited number of individuals involved in the study, the research could be replicated on a larger scale, either across a broader sample of South African education professionals to determine if the reliance on Bloom's is systemic across the entire South African sector, or at an international level with professionals engaged in ODL to determine the level of relevance of Bloom's taxonomy in an evolving landscape.

Testing Hybrid Frameworks: The findings of the research advocate for an amalgamation of frameworks, calling for a hybrid taxonomy that merges Bloom's Taxonomy with other frameworks for contextual relevance, whether this be from a professional body with its own industry standards or another pedagogical framework. A study exploring the efficacy of such hybridisation would offer valuable insights into the possible evolution of learning outcome design in both the South African regulatory environment and globally.

Regulator Perspectives: This study focused purely on the perspective of education professionals in the roles of qualification designers and did not touch on the variable of whether any of the participants themselves were registered as peer evaluators with the South African regulatory bodies. Future studies could explore the concept of Bloom's continued use in the accreditation landscape from the perspectives of peer reviewers and official regulatory leaders to understand the rationale behind the perceived enforcement of Bloom's taxonomy as a guiding accreditation tool.

5.8. CONCLUSION

Bloom's Taxonomy is a 20th-century pedagogical tool that has held prominence at a global level for nearly seven decades, having undergone an official revision only once during that time period. As the 21st century brings with it technological advancements that are shaping the way we perceive and learn about the world around us (both physical and digital), the question has been raised as to whether the time is right for a further revision of the taxonomy

that has formed the foundation of the very qualifications and industries that now require further change.

The question raised by this study focused on the perceived relevance of Bloom's taxonomy within the confines of the South African Higher Education landscape, and more specifically, within the South African ODL environment, which has been highlighted by the South African government as a tool necessary for increasing access to education in a highly diversified economy. The significance of this study lies in the perceived frustration felt by education professionals who have acknowledged the need for revision or enhancement of Bloom's Taxonomy, yet feel restricted by either a lack of exposure to such technology or a perceived rigidity by regulatory bodies to accept the inevitable change required to stay relevant in a technologically evolving landscape.

The study also illustrates a potential way forward, not through the abandonment of Bloom's taxonomy, but rather through a continued evolution of the taxonomy through the amalgamation with more contemporary systems or frameworks, thereby preparing South African graduates for a technology-aligned economy and global landscape.

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APPENDICES

Appendix A: Request For SAQA POPIA Undertaking Form

PO BOX 111
Cato Ridge
KwaZulu-Natal
3680

03 March 2025

South African Qualifications Authority
Lourie Place, 189 Lunnon Road
Hillcrest Office Park
Hillcrest
Pretoria
0083

Attention: SAQA Secretariat
(saqasecretariat@saqa.org.za | saqainfo@saqa.org.za)

REQUEST FOR SAQA POPIA UNDERTAKING FORM FOR MASTERS IN EDUCATION RESEARCH

I, Andrew James Hayward – Student Number 36634131, am currently registered for my Master's in Education Specialising in Open Distance Learning (ID 98999) at the University of South Africa, supervised by Prof. Geesje Van den Berg (Vdberg@unisa.ac.za). The title of my research is:

'*The Relevance of Bloom's Taxonomy For Technologically Aligned Pedagogies in the South African Open Distance Learning Environment'*

As per the SAQA Policy titled 'Privacy Statement and Informed Consent – August 2021', subsection 4.2, I would like to request **SAQA's POPIA Undertaking Form** to use your database as part of my study.

Part of my quantitative research will involve obtaining data from the SAQA public database, focusing specifically on registered qualifications accredited by the Higher Education Qualifications Sub-framework (HEQSF), which lists the primary or delegated quality assurance functionary as the Council on Higher Education (CHE).

The population will be further defined by focusing on programmes listed as Level 5-10 on the National Qualifications Framework (NQF).

Whilst the SAQA ID numbers of qualifications will be recorded, this will be used only for purposes of being a unique identifier for the dataset, as the research is focused on determining the frequency of Bloom's action verbs used in each qualification type, along with the number of verbs used per exit level outcome statement. Neither the SAQA numbers nor the names of the institutions will be used as part of the research and shall not form, or be referenced to, in the findings of the research

– both the SAQA numbers and names of institutions will be redacted in the raw datasheets upon submission to the University of South Africa.

A copy of my UNISA registration document has been included in this request as Annexure A to serve as evidence of enrolment in the above-mentioned qualification.

Kind Regards,

Mr. Andrew James Hayward

(UNISA – 36634131)

Appendix B: Request to Utilise KZN QA Forum Mailing List for Interviewee

PO BOX 111
Cato Ridge
KwaZulu-Natal
3680

05 May 2025

KwaZulu-Natal Quality Assurance Forum

Attention: Mr. Devan Munien (*Chairperson*)
Dr. Thiruveni (Tilly) Moodley *(Vice-Chairperson)*

REQUEST TO UTILISE KZN QAF MAILING LIST FOR MASTERS IN EDUCATION RESEARCH

I, Andrew Hayward *(KZN QAF Secretariat)*, am currently registered for my Master in Education Specialising in Open Distance Learning (ID 98999) at the University of South Africa, with the title of my research being:

'*The Relevance of Bloom's Taxonomy For Technologically Aligned Pedagogies in the South African Open Distance Learning Environment'*

As part of my research, I will be conducting online, semi-structured interviews with Higher Education academics, quality practitioners, and curriculum design experts to determine their perspectives on the potential value of digital terminology at both a theoretical framework and regulatory level in the context of South African higher education.

This letter serves as a formal request to the chair and vice-chair of the forum to utilise the KZN QAF mailing list to send out invitations to members of the forum to determine their availability and willingness to participate in the research.

I look forward to receiving a positive response from you both

Kind Regards,

AJ Hayward

Mr. Andrew James Hayward
(UNISA – 36634131)

Appendix C: Participation Information Sheet and Consent

PARTICIPANT INFORMATION SHEET

Ethics clearance reference number	
Research permission reference number	
Title	The Relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment
Date	

Dear Prospective Participant

My name is Andrew James Hayward, and I am doing research with Prof. Geesje van den Berg, a Professor in the Department of Education: Curriculum and Instructional Studies, towards a Master of Education in ODL at the University of South Africa. We are inviting you to participate in a study entitled '*The Relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment*'.

3. What is the purpose of the study?

I am conducting this research to, firstly, find out the extent to which education professionals involved in qualification design align themselves with and support the use of Bloom's revised taxonomy in the context of South Africa's technologically aligned distance learning environment. Secondly, to determine whether higher education professionals might be willing to adopt digital alternatives to the traditional taxonomy, and if so, what considerations should be made to accommodate most South African students and academics alike

4. Why am I being invited to participate?

The target population for this study focuses on professionals within the South African Higher Education environment, both public and private sectors, who have had experience in curriculum design and the shift towards an online, distance learning environment.

As a member of the KwaZulu-Natal Quality Assurance Forum, your expertise in the field of quality higher education provision has already been acknowledged by the forum, and thus you are a prime candidate to offer your perspectives and experience in the research topic.

Permission was obtained from the Chair and Vice Chair of the Forum to utilise the forum's mailing list to reach out to you to enquire about your willingness to participate. There are approximately thirty-six (36) individuals listed in the mailing list, of which a minimum of seven (7) individuals will be required to participate in the research.

5. What is the nature of my participation in this study?

Your participation in the study will involve two sections, one being contingent upon the other.

The first section is a brief questionnaire of four (4) demographic-type questions concerning your highest qualification, years of experience in the private or public sector, and your area of expertise. The final question is merely to indicate your willingness to continue the discussion in online, one-on-one interviews. The first section should take no more than 5 minutes of your time; examples of the questions are provided at the end of this document.

Should you agree to continue the discussion further, then a one-on-one virtual discussion will be scheduled at a time that is convenient to you. The interview should take no more than one hour (1hr), and you will be provided with a transcript of the discussion for your reference. Examples of the questions are provided at the end of this document.

6. Can I withdraw from this study even after having agreed to participate?

Before participating, please review the following information regarding your rights and the conduct of this research:

- **Confidentiality and Anonymity**: Participation in this study is entirely voluntary. Should you decide to participate, please be advised that neither your name nor your institution will be recorded. All data collected will be kept anonymous.
- **Right to Withdraw**: You may withdraw your consent and discontinue participation at any time before, during, or post the online interviews. Demographic information from the questionnaire is anonymized, and thus it will be impossible to identify your responses for removal should you choose to withdraw.
- **Use of Data:** The information you provide will be used solely for the purposes of this academic research. Copies of transcripts from the semi-structured interviews will be made available to participants to authenticate.

7. What are the potential benefits of taking part in this study?

The preliminary research for this study has involved an analysis of the exit level outcomes (ELOs) from 362 qualifications accredited by the CHE and listed on the SAQA database across various qualifications (NQF 5-10). The analysis focused on the semantic complexity of outcome statements and the frequency of action verbs used in each qualification type. The insights drawn from this analysis will be shared with those of you who choose to participate in further one-on-one interviews.

8. Are there any negative consequences for me if I participate in the research project?

There should be no reputational risk to either you or your institution through participation in this research. Copies of transcripts from the semi-structured interviews will be made available to participants to authenticate before being analysed. All personal or institutional identifiers will be removed from the data collection, analysis and reporting aspects of the research.

9. Will the information that I convey to the researcher and my identity be kept confidential?

All personal or institutional identifiers will be removed from the data collection, analysis and reporting aspects of the research. Your answers will be given a code number, or a pseudonym, and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. Copies of transcripts from the semi-structured interviews will be made available to participants to authenticate before being analysed. Your contributions may be reviewed by people responsible for making sure that research is done properly, including the members of the Research Ethics Review Committee.

10. How will the researcher(s) protect the security of data?

All records of your responses will be stored on a password-protected computer and saved on a Microsoft-based cloud platform linked to the UNISA domain. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable (such as using the data for a purpose unrelated to the initial aim and objectives or the study).

11. Will I receive payment or any incentives for participating in this study?

There are no payments or rewards offered, financial or otherwise, for participation in this research activity

12. Has the study received ethics approval?

This study has received written approval from the Research Ethics Review Committee of the Department of Education: Curriculum and Instructional Studies of Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

13. How will I be informed of the findings/results of the research?

If you have any questions, require further clarification, or would like to be informed of the final research findings, please do not hesitate to email me at 36634131@mylife.unisa.ac.za or

contact me via +2776 549 74 35. The findings are accessible for three months following the acceptance and approval of UNISA. Should you have concerns about the way in which the research has been conducted, you may contact Prof. Geesje van den Berg at Vdberg@unisa.ac.za or on +2712 429 48 95. Contact the research ethics chairperson of the College of Education, Prof AT Motlhabane, at Motlhat@unisa.ac.za if you have any ethical concerns.

Thank you for taking the time to read this information sheet and for participating in this study.

Thank you,

AJ Hayward

Mr. Andrew James Hayward

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____ (*participant name*), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

- I have read (*or had explained to me*) and understood the study as explained in the information sheet.
- I have had sufficient opportunity to ask questions and am prepared to participate in the study.
- I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (*if applicable*).
- I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.
- I agree to the recording of the online semi-structured interview
- I have received a signed copy of the informed consent agreement.

Participant Name & Surname *(please print)* _____

_____ _____

Participant Signature Date

Researcher's Name & Surname *(please print)* _____

_____ _____

Participant Signature Date

Appendix D: Participant Questionnaire (Demographics)

Participant Demographics

1. What is your Highest Qualification?

- ☐ Higher Certificate *(Field:)* _____
- ☐ Diploma *(Field:)* _____
- ☐ Bachelor's Degree *(Field:)* _____
- ☐ Master's Degree *(Field:)* _____
- ☐ Doctoral Degree *(Field:)* _____
- ☐ Other (please specify): _____

2. How many Years of Experience do you have in Higher Education?

- ☐ 0–5 years
- ☐ 6–10 years
- ☐ 11–15 years
- ☐ 16+ years

3. Has your Experience been in the Private or Public Sector?

- ☐ Private Sector
- ☐ Public Sector
- ☐ Both

4. What is your Primary Area of Expertise?

- ☐ Curriculum Design and Development
- ☐ Educational Technology
- ☐ Instructional Design
- ☐ Programme Coordinator / Academic Head
- ☐ Quality Assurance in Higher Education
- ☐ Other (please specify): _____

5. Discussion on Bloom's Revised Taxonomy

Please indicate your willingness to continue the discussion in online, one-on-one interviews.

- ☐ Yes, I am willing *(Email:)* _____
- ☐ No, thank you

Appendix E: Semi-structured Interview Questions

Semi-structured Interview Sessions

Semi-structured Interview Requirements

Intention: The open-ended questions are designed to encourage discussion with education professionals on their interpretation and experiences in using Bloom's Revised Taxonomy in curriculum design. The questions will attempt to determine their potential willingness to engage with alternative digital taxonomies better aligned to modern modes of provision.

Resources: The findings of the content analysis of qualification exit level outcomes extracted from the SAQA database will be shared with participants to encourage discussion.

1. Interview Details

Participant Identifier:	
Date & Time:	
Meeting Link:	

2. Questions: Bloom's Revised Taxonomy

Questions		**Identified Themes or Keywords**
Current Use:	How are you or your institution currently implementing Bloom's taxonomy in the design or review of exit level outcomes?	
Relevance:	What do you consider to be the benefits or limitations of the continued use of the taxonomy in an online, digital learning environment?	
Impact:	How much of an influence do you feel the taxonomy has on the CHE and SAAQA accreditation process of new qualification designs?	

3. Questions: Digital Taxonomy

Questions		**Identified Themes or Keywords**
Openness:	Have you ever considered adopting a digital taxonomy to better align with technological advancements – If so, which taxonomies have you considered?	
Features	What technological terms, features or applications would make a difference to your curriculum designs and why?	
Comparison:	Do you think a digital taxonomy should replace Bloom's taxonomy, or is there merely a need for a revision to accommodate technological advancements?	

4. Questions: Results of Content Analysis

Questions		Identified Themes or Keywords
Complexity:	What are your thoughts on using multiple verbs in exit level outcome design and its potential impact on the complexity of competency achievement?	
Frequency:	What are your thoughts upon seeing what the top ten most frequently used action verbs per qualification type are?	
Comments:	Are there any additional comments or points you would like to make on the future of learning outcome design for a technologically advancing mode of provision?	

Thank you for your Participation

Your opinions and insights will contribute significantly to understanding and potentially reimagining the role of Bloom's taxonomy in South Africa's digital era. A copy of the interview transcript will be made available to you to confirm and authenticate.

Appendix F: UNISA College of Education Research Ethics Committee

UNISA university of south africa

College of Education _ERC

NHREC Registration # : (if applicable)
Ref #: 8044
Name: Mr Andrew James Hayward
Student #: 36634131
Staff #:

Date: 26/08/2025

Dear: Mr Andrew James Hayward

Decision: Ethics Approval from 26/08/2025 to 25/08/2028

Researcher: Mr Andrew James Hayward

35 Kingfisher Drive, Inchanga Park Country Village, Inchanga West, 3706

Durban

36634131@mylife.unisa.ac.za +27765497435

Supervisor: Professor Geesje van den Berg vdberg@unisa.ac.za

Co-Supervisor:

Co-Researcher(s):

Email address:

The Relevance of Bloom's Taxonomy for Technologically Aligned Pedagogies in the South African Open Distance Learning Environment

Qualification: Master of Education in Open Distance Learning (98999)

Thank you for the application for research ethics approval by the College of Education _ERC for the above-mentioned research study. Ethics approval is granted for three years .

The **low risk application** was **reviewed** by the College of Education _ERC in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising during the undertaking of the research study that may affect the ethical integrity of the study, including those involving research participants, third parties, or juristic persons, must be reported in writing to the College of Education _ERC without delay.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that may affect study-related risks to research participants, juristic or third persons, must be reported in writing to the College of Education _ERC, accompanied by a progress report.

5. The researcher will ensure that the research study complies with all applicable national legislation, professional codes of conduct, institutional guidelines, and scientific standards relevant to the specific field of study. Where applicable, adherence to the following South African legislation is essential: the Protection of Personal Information Act (No. 4 of 2013), the Children's Act (No. 38 of 2005), and the National Health Act (No. 61 of 2003)

6. Future use of this research data is permitted only in de-identified form and only for secondary research with objectives similar to those of the original study. Any secondary use involving identifiable human data will require additional ethics clearance.

7. No fieldwork activities may continue beyond the stated expiry date (25/08/2028). A completed Research Ethics Progress Report must be submitted as an application for renewal and is subject to approval by the Research Ethics Committee. A Close-Out Report must be submitted upon completion of the research study.

8. The College of Education _ERC may require the submission of regular progress reports on an annual basis, in alignment with Section 7.2 of the Unisa Policy on Research Ethics (2024).

Additional Conditions

1. Disclosure of data to third parties is prohibited without explicit consent from the research participants and Unisa.
2. Research data must be stored in compliance with the university's research data management policy for a period of up to 15 years.
3. When publishing the results, the researcher must take appropriate precautions to safeguard the confidentiality and privacy of the research participants, juristic persons, third parties, and the university, in accordance with institutional policies and ethical standards.
4. Adherence to the National Statement on Ethical Research and Publication Practices, specifically Principle 7 on Social Awareness, must be ensured. This principle states: 'Researchers and institutions must be sensitive to the potential impact of their research on society, marginal groups, or individuals, and must consider these when weighing the benefits of the research against any harmful effects, with a view to minimising or avoiding the latter where possible.' The University of South Africa (Unisa) accepts no liability for any failure to comply with this principle.

Note

The reference number 8044 should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Kind regards,

Prof Justin Oswin August
Chair of College of Education _ERC
E-mail: augusjo@unisa.ac.za

Prof M Makoe
Executive Dean / By delegation from the Executive Dean of College of Education _ERC
E-mail: qakisme@unisa.ac.za, magolmc@unisa.ac.za

Appendix G: Summary of Thematic Analysis

G1. Current Use of Bloom's Revised Taxonomy

Code	CUB		
Question	How are you or your institution currently implementing Bloom's taxonomy in the design or review of exit level outcomes?		
Keywords or Themes	• Experiential application; Reliance on the 'triangle' model; Preference over level descriptors. • Framework use; Integration; Shifting to alternative models (SMART). • Full design process utilisation; NQF 5 to 9 program design; Assessment criteria; Specific and Exit level Outcomes. • Personal utility; External examining; Faculty development tool. • Secondary tool; Primary reliance on SAQA/Critical Cross-Field Outcomes; Reference document only. • Status quo; Continuing traditional design; No current institutional change. • Unquestioned centrality; "The Bible"; Scaffolding tool; Learned through experience; SAQA Level Descriptors alignment.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 1	18:00	It's very rare. I don't. If I look at the things I based on my knowledge of that triangle, I apply Bloom's taxonomy. I don't really go to the level descriptors unless. It's a specific skills or professional program and I want to make sure that, you know, my thinking is aligned with what SAQA states.
	Participant 2	16:05	Essentially, we are using Bloom's as a framework. So, it's a framework that we refer to when we are, for example, designing the exit level outcomes.
	Participant 2	17:06	No, I think we're moving away. Well, well, not completely away, but transcending I would say into now smart is becoming even more applicable than Bloom's, you know, SMART.
	Participant 3	9:14	We are adapting it in terms of designing our programs from the highest from your NQF level 5 to NQF level. Nine so far, those are the programmes that we have designed, and then we use it in, that sense. That's how we apply it and we also use it for the specific outcomes for each module.
	Participant 3	9:47	And for the exit level outcomes, so the whole design process is using Bloom's Taxonomy.
	Participant 4	8:11	Yeah, that is very, very interesting. I had to basically find my own way in trying to merge or align the taxonomies with the SAQA level descriptors.
	Participant 4	8:47	Level descriptors rather than with the blooms. That is just in a nutshell, yeah.
	Participant 4	10:08	So, I personally am I work far more with the SAQA level descriptors then I keep an eye on the Taxonomies, but I'm not so like focused on that.
	Participant 4	11:10	Not necessarily, but as I've said, I find it very easy to work with the level descriptors because once I've actually designed the purpose of the program and you will know this because this was our approach.

Code	CUB		
Question	How are you or your institution currently implementing Bloom’s taxonomy in the design or review of exit level outcomes?		
Keywords or Themes	• Experiential application; Reliance on the 'triangle' model; Preference over level descriptors. • Framework use; Integration; Shifting to alternative models (SMART). • Full design process utilisation; NQF 5 to 9 program design; Assessment criteria; Specific and Exit level Outcomes. • Personal utility; External examining; Faculty development tool. • Secondary tool; Primary reliance on SAQA/Critical Cross-Field Outcomes; Reference document only. • Status quo; Continuing traditional design; No current institutional change. • Unquestioned centrality; "The Bible"; Scaffolding tool; Learned through experience; SAQA Level Descriptors alignment.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 5	6:23	the cognitive domain of Bloom's taxonomy, which I actually found quite useful and adapted some of it. So, you know, Bloom's has in a way been part of my life for a long time. Um But that was the original Bloom's and then obviously the revised one.
	Participant 5	10:03	I know it's it’s almost an artificial distinction, but the the higher order thinking and the and the lower order thinking, you know, the lots and the hots. I actually find that quite useful 'cause I do quite a lot of external examining and looking at papers and often.
	Participant 5	10:21	Depending on the level, I'm actually working on one now. It's for fourth year medical students and and then I will look at it to see, you know, whether the questions they're asking or at the higher level or the lower level, and my report always includes an analysis of that.
	Participant 5	10:56	The right diagnosis and the list that's been given or whatever. So, it's not. I don't necessarily think that Bloom is is directly applicable to to every situation, but I found it a useful starting point. Let's put it that way.
	Participant 5	11:16	useful way of getting new new lecturers, new academics to understand that you know there are there are different levels at which you want students to be to actually be operating in the cognitive levels.
	Participant 6	12:35	A model that we've adopted as yet, unless there's something I don't know from the learning and teaching space, but in terms of the development of qualifications, we're still continuing the way we are. There is, there are frameworks I know that they were looking at, but I'm not. Really sure if they implemented that yet.
	Participant 7	6:00	Because everything that we do, I mean that's it's almost the first sort of technical layer of any program submission that we have to do.
	Participant 7	6:35	And rightfully said what we've learned ourselves, not necessarily regulatory taught or regulatory.
	Participant 7	17:53	We would stick to that and design. Everybody knows Blooms and we would scaffold according to Blooms and and and that would be.

Code	CUB		
Question	How are you or your institution currently implementing Bloom’s taxonomy in the design or review of exit level outcomes?		
Keywords or Themes	• Experiential application; Reliance on the 'triangle' model; Preference over level descriptors. • Framework use; Integration; Shifting to alternative models (SMART). • Full design process utilisation; NQF 5 to 9 program design; Assessment criteria; Specific and Exit level Outcomes. • Personal utility; External examining; Faculty development tool. • Secondary tool; Primary reliance on SAQA/Critical Cross-Field Outcomes; Reference document only. • Status quo; Continuing traditional design; No current institutional change. • Unquestioned centrality; "The Bible"; Scaffolding tool; Learned through experience; SAQA Level Descriptors alignment.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 7	18:05	The Bible, as it were, and we would then convince ourselves to say that this is the central to the design and the review of the the qualifications exit level outcomes. OK, does it? Does it align with Bloom's taxonomy? All right, we would say this is makes sense in terms of.
	Participant 7	19:53	Uh, certain types of questionnaires or mappings. Taxonomy Bloom's still underpinned the outcome, but there was an attempt to express the learning.

G2. Perceived Relevance of Bloom's Revised Taxonomy

Code	PRB		
Question	What do you consider to be the benefits or limitations of the continued use of Bloom’s taxonomy in an online, digital learning environment?		
Keywords or Themes	• Digital interpretation difficulty; Lack of techno-savvy academics; Cognitive demand variance; High expertise required for assessment. • 5IR/6IR relevance gap; New digital competencies; Ethical/AI considerations • Restrictive practicality; Home language barrier; Confusion due to lack of verb explanation; Preventive of student success. • Societal context change; Mode-neutral transformation; Need to Reframe/Reflect digital society; Bloom's is outdated (pre-2012/COVID). • Academic pegging; Lack of transfer; Excludes psychomotor/affective; Contextual/Discipline limitations • Outdated; Traditional classroom origin; Difficulty with higher cognitive levels and digital aspects. • Cognitive rigidity; Mode limitation (written response); Failure to adapt to online/digital context; Prescribing a single progression path.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 1	24:26	What is the word technology literate? So, techno-savvy. So, if they would apply Bloom's technology taxonomy now say apply, how the hell will they interpret apply in the technology?
	Participant 1	24:46	Context because I don't have the more than basic knowledge of in digital environment
	Participant 1	25:40	Use Bloom's. Yeah, and Bloom's technology to its. It might be an easy exercise you think you, but there is a way to use it to assess it on a Level 7. But then you have to be so. uh such an expert in curriculum design and also now know how you can use a multiple choice questionnaire to test on a level seven. Not everybody can do that. And how do you develop your question back?
	Participant 1	28:35	I think we have to adapt these verbs because communicate might have a different meaning then, because the cognitive demand will be different.
	Participant 2	11:33	So that's now becoming even more prevalent in the IT space because of us now being firmly in five IR and now seeing the onset of six IR.
	Participant 2	18:45	Also, how it actually influences the curriculum design, especially for technological subjects where we mentioned now that it is no moving away from the effect of artificial intelligence.
	Participant 3	6:07	When you look at them, they don't apply as such. So, therefore, like they're sort of restrictive, they don't expand into so many ways of practicality, so to say.
	Participant 3	7:17	And I think that some of these or maybe all of Bloom’s taxonomy, you can find that it is kind of preventative towards student success. And especially from the African point of view, in terms of the home language, you can find that it restricts certain students, especially those who are coming from rural areas who have learned English at a later stage. Who haven't learnt English at a lower grade, so it can restrict them in in in in in in some way. So I agree with you in terms of they're restrictive. Maybe there can be a way that they can be supplemented by other explanations.

Code	PRB		
Question	What do you consider to be the benefits or limitations of the continued use of Bloom's taxonomy in an online, digital learning environment?		
Keywords or Themes	• Digital interpretation difficulty; Lack of techno-savvy academics; Cognitive demand variance; High expertise required for assessment. • 5IR/6IR relevance gap; New digital competencies; Ethical/AI considerations • Restrictive practicality; Home language barrier; Confusion due to lack of verb explanation; Preventive of student success. • Societal context change; Mode-neutral transformation; Need to Reframe/Reflect digital society; Bloom's is outdated (pre-2012/COVID). • Academic pegging; Lack of transfer; Excludes psychomotor/affective; Contextual/Discipline limitations • Outdated; Traditional classroom origin; Difficulty with higher cognitive levels and digital aspects. • Cognitive rigidity; Mode limitation (written response); Failure to adapt to online/digital context; Prescribing a single progression path.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 3	24:49	Yeah, the problem is that as you as you said, compared to the SAQA descriptors, they are more explained on what is expected of you, but these ones are not explained. That's why there's a confusion even.
	Participant 3	30:31	That's where the issue is. And then while they don't understand the current Bloom's taxonomy and then we integrate something that is new, maybe it can make it worse, yeah.
	Participant 4	20:22	Can you remember and then the standards that that is either sitting in the adverb or the adjective and then the context of performance.
	Participant 4	20:42	But because the context of society, society is not the same anymore as in 2012. I mean, Andrew, if you think it's only 13 years.
	Participant 4	21:37	Yeah, I I wouldn't say supplemented, but definitely they're going to have to be reframed to reflect. Yeah, yeah, they're going to have to be reframed to reflect.
	Participant 4	21:58	The different, the digital, the digital context of of society and I mean learning takes place in society. So, because society, yeah, because society looks so much different.
	Participant 5	7:56	So I don't believe that the the the. I mean people do produce lists of of verbs, but but I think the verbs are have to be very contextualized and have to be very discipline, discipline related. Now obviously some of them will be, but they're not, they're not like typical Bloom's verbs, so.
	Participant 5	11:16	It also always interests me that we always devolve back down to, well, not back down, but but to the the cognitive taxonomy and very seldom use the affective or the psychomotor. And that probably also relates to the fields we're in. But if you're thinking about medicine or, you know, physio and all.
	Participant 5	13:31	And we teach them teamwork, but we never use Bloom's taxonomy at the. yeah, to define these kind of team related skills and if you, I mean you might, you might put something in like you know, must be able to operate effectively in a team and you'll say, well, oh, that's at quite a high level, you know, we'll make that a.

Code	PRB		
Question	What do you consider to be the benefits or limitations of the continued use of Bloom's taxonomy in an online, digital learning environment?		
Keywords or Themes	• Digital interpretation difficulty; Lack of techno-savvy academics; Cognitive demand variance; High expertise required for assessment. • 5IR/6IR relevance gap; New digital competencies; Ethical/AI considerations • Restrictive practicality; Home language barrier; Confusion due to lack of verb explanation; Preventive of student success. • Societal context change; Mode-neutral transformation; Need to Reframe/Reflect digital society; Bloom's is outdated (pre-2012/COVID). • Academic pegging; Lack of transfer; Excludes psychomotor/affective; Contextual/Discipline limitations • Outdated; Traditional classroom origin; Difficulty with higher cognitive levels and digital aspects. • Cognitive rigidity; Mode limitation (written response); Failure to adapt to online/digital context; Prescribing a single progression path.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 5	15:00	um I also think that quite a lot of what we're doing and using Bloom's taxonomy is kind of almost like pegged in the in the academic environment and isn't necessarily thinking about the transfer and the translation of those particulars.
	Participant 6	5:46	I think also another point on that Bloom's taxonomy is that it just dates way back to traditional classroom teaching in a classroom setting and it is not. I know there is a later.
	Participant 6	9:21	But the problems might arise where higher cognitive levels and then the digital aspect is where you will find problems because yeah, I that's what I I think about the where we would find issues. I think as you go go up there whether it's more high cognitive levels.
	Participant 7	18:25	A student's cognitive progression as as though a student cannot cognitively progress in any other way. OK, we would design the assessment in accordance with that same foundation. All right, so you're working from your foundational understanding to a higher order application.
	Participant 7	19:17	So applying and analyzing, as an example, needed to go beyond a written response and the regulation started introducing this component of work. Integrated learning started making a feature equivalency of provision.
	Participant 7	38:10	We'll just call it experiential, right? Maybe not work integrated learning, but experiential learning has to play a bigger, a bigger part and that makes a lot more room, especially like in the program submissions and stuff.
	Participant 7	48:51	It's a little bit of pride because people just think, but I worked on this thing for so long or we've been doing, you know, I'm so tired of hearing that excuse. We've been doing it for this long. You know, we've always been, we've always been doing it this way. It does not mean that the Way was incorrect. That way has served its purpose. It was fit for purpose for that season. That season has now has now come to an end. Um, I think it's a fantastic topic and yeah, I think.

G3. Impact Of Bloom's Revised Taxonomy on Programme Accreditation

Code	IOB		
Question	How much influence do you feel the taxonomy has on the CHE and SAQA accreditation process of new qualification designs?		
Keywords or Themes	• Accreditation non-compliance; Regulatory bodies not 'practicing what they preach'; Peer review by non-curriculum experts. • Application is key; Critical for curriculum design; Effectiveness depends on interpretation. • Mechanical processing; Technical over academic focus; Not legislated; SAQA/HEQSF relevance questioning. • No issues; Accreditation bodies align with Bloom's; Provides a foundational framework. • Over-concentration on verbs; Regulator focus over practical design; Excessive application focus (WIL/Honours). • SAQA relationship; Accreditation driver; ELO variability; Administrative		
References	**Participant**	**Timestamp**	**Quote**
	Participant 1	17:25	But then SAQA that is they are the owners of the exit level outcomes for registration, the level descriptors for registration purposes. They don't pick it up.
	Participant 1	19:22	Yeah, but The thing is, what they do is they don't practice what they preach because they give you these things. But if you look at the current qualifications that had gone through the reregistration process, it's still it is.
	Participant 1	21:01	The experience here and how they see it, but they know they know the discipline now because they know the content, but they don't know curriculum design and this is now an indication of what I tell you.
	Participant 2	18:10	I know I think it can be effective depending on the application, of course how it is applied. So that for me is key. So yes, like any framework or any model, it's in the application.
	Participant 3	14:09	I think they concentrate on the verb and on the too much on the Bloom’s taxonomy. Honestly it's blinking because even the line of evaluation you can see that they concentrate on the On the on the bloom taxonomy and the web for for for for for instance the the the the the evaluators when coming to the honours programmes the questions.
	Participant 3	14:59	To explain, especially they they look at the verbs more. So yeah, in the bloom text, I think they concentrate on the on the verbs and on the Bloom text, you know.
	Participant 3	27:38	You know, of practicality or something like that. So yeah, we we we concentrate too much on on on on Bloom taxonomy more than anything else.
	Participant 5	16:00	And all this accreditation stuff is the relationship between Bloom's and the the SAQA level descriptors. So I mean there there is obviously overlap there because those descriptors tell you tell you quite a lot.
	Participant 5	16:53	And I was astounded at the very even in Foundation for Professional Development, FPD. Obviously nobody was was looking at our our institutional approach to writing exit level outcomes because they're amazingly variable.

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References	**Participant**	**Timestamp**	**Quote**
	Participant 5	17:33	The way those are relating to either Bloom or or or level descriptors, cycle level descriptors is very variable and and I think they need they probably needs to be. I mean I I don't know if it's necessary that we have a A1 size fits all guideline but um I think.
	Participant 5	17:53	it would be quite useful, particularly if if we're now contesting the the Bloom's taxonomy, or at least the cognitive ones, in the in the digital space.
	Participant 6	13:29	I I think we we it's like the CHE and SAQA they they basically have accreditation processes and with the Bloom's taxonomy that's that underpins it. If I could say the there is an alignment in the learning outcomes assessment strategies and I think you have descriptors. So I think with SAQA and CHE they've they have built that in. So there were no there are no issues.
	Participant 7	5:22	No, Andrew, I think that actually it's a, it's a really, really nice study. In fact, it's quite a nice branch of of some of the the themes that emerged from my study. So we had quite a few respondents questioning Bloom's for one and just questioning. By virtue of question in Blooms, the I don't want to say the relevance, but maybe maybe relevance is the right question where our frameworks are then at, in particular the SAQA NQF level descriptors and then what is going to be the impact on the HEQSF in particular.
	Participant 7	6:00	Because everything that we do, I mean that's it's almost the first sort of technical layer of any program submission that we have to do.
	Participant 7	6:35	And rightfully said what we've learned ourselves, not necessarily regulatory taught or regulatory.
	Participant 7	15:50	I firmly believe that the majority of applications became quite mechanical in its administrative and in its academic sort of processing. And if I can just explain that, I think it got to a point so, so.

G4. Openness to Digital Taxonomies

Code	OTD		
Question	Have you ever considered adopting a digital taxonomy to better align with technological advancements? If so, which taxonomies did you consider?		
Keywords or Themes	• Considering alternatives; Limited adoption; SMART framework mentioned. • Everyone is talking about it; Seen as a necessary progression; Not yet formally adopted • Important consideration: Need for a new framework due to Bloom's obsolescence; Study spin-off. • No current digital adoption; Still using traditional taxonomy. • Useful idea; Not a final list; Contextualization		
References	**Participant**	**Timestamp**	**Quote**
	Participant 2	17:22	That, yeah, yeah, yeah, exactly. So for us in the IT space, yes, we consider Bloom's, but we also consider other taxonomies, I should say, especially it's like, for example, smart and bring that into our alignment, yeah.
	Participant 2	20:15	No, actually we've only started to do that now. Yes, only just begun because we were so, you know, old school, I should say, where everybody was using blooms and because we use the CHE guidelines so closely in Applying for these programs. But yeah, we've only started to incorporate that now, but very limited. Very, very limited.
	Participant 3	12:18	I understand you. We haven't used the digital ones so far.
	Participant 5	9:25	And so I think this idea of creating a new list for for the digital space is useful.
	Participant 5	9:45	But it's again, it's it's not the only list. You know other depending on what you're doing and and how you're doing it, you may have other verbs that that you want to put in.
	Participant 6	6:32	I know that that's the one that everyone is now saying, oh, we need to look at the digital taxonomy because they can't move past Bloom's taxonomy. There's the that's all we know. That's that's all that I think even the regulators, as you've mentioned, it's nowhere in guidelines and regulations. It's just an assumed to be in place.
	Participant 7	8:33	I think some sort of digital framework may become quite important in light of this.

G5. Features of Digital Taxonomies

Code	FOD		
Question	What technological terms, features or applications would make a difference to your curriculum designs and why?		
Keywords or Themes	• Digital inclusion; Higher cognitive/IT/technical aspects. • Employability; Simulations; Digital Case Studies; Integrated learning; COVID-accelerated changes. • Global work context; Moving with the times; Student advancement. • Industry relevance; 4IR/5IR competencies; Verbs: create, innovate, design, adapt; Ethical Intelligence (EI). • Teamwork/Social environment; Lack of prescription; Undefined competencies; Multidisciplinary skills. • Technology-informed learning; Digitisation; Societal change; E-governance/E-commerce concepts.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 2	21:57	Two things come to mind, one being pedagogical intent and the other industry relevance. So when we speak of those frequency of verbs, you know the apply, analyse, evaluate.
	Participant 2	23:15	And then finally mention it again the four IR and five IR competencies. So then we would speak about verbs like create or innovate.
	Participant 2	23:30	Now that can be thought in in terms of way graduates must not just now understand technology, but now also be able to design, adapt and yeah, innovate.
	Participant 2	32:33	And not just AI, but I'm thinking about ethical intelligence, you know? And yeah, we, I mean, we spoke about it previously, years previously where the flipped classroom was mentioned, right?
	Participant 3	13:00	We need to move with the times so that the students, they can also be advanced so that and especially the fact that the students now they get, they are global, they can go and work anywhere. So this can be of assistance instead of only speaking to the traditional ones.
	Participant 4	19:28	The role of technology and governance and then globalization and good governance and citizen engagement and participation, equity and social justice and adaptability and resilience. So why I'm raising this?
	Participant 5	17:53	And you mentioned the fact that students are creating an online social environment.
	Participant 5	18:13	There are like there are teamwork things going on there and I'm not sure we prescribing what that looks like strongly enough, you know the thing we'll say. Everyone wants teamwork, but it actually tells you very little about what's expected.
	Participant 6	9:40	That they would like to infuse digital inclusion. It may be more difficult on higher of the taxonomy than lower. That's also something to consider.
	Participant 7	19:37	Started making a feature. Things like employability started making a feature and then you started seeing things like simulations happening for certain programs, digital, digital case studies.

G6. Comparison of Digital Taxonomies

Code	COD		
Question	Do you think a digital taxonomy should replace Bloom's taxonomy, or is there merely a need for a revision to accommodate technological advancements?		
Keywords or Themes	• Adaptation/Revision needed; Changing cognitive demands of existing verbs. • Point of departure; Supplementation; Contesting the cognitive domain. • Reframing required; Transformation over supplementation/replacement; Adapting to digital context. • Revision/Reinterpretation; Adding new verbs; Technology speed/obsolescence; Broad categories needed. • Supplementation over replacement; Mixture/Expansion; Gradual adoption starting at higher NQF levels; New taxonomy introduction is too complex/confusing. • Supplementation over replacement; Partnership approach. • Too much risk; University status goal; Need for regulatory guidance		
References	**Participant**	**Timestamp**	**Quote**
	Participant 1	28:35	I think we have to adapt these verbs because communicate might have a different meaning then, because the cognitive demand will be different.
	Participant 3	7:00	That they can be supplemented because we can't change them just like that. Maybe if there will be expansion on each aspect of the Bloom taxonomy, maybe that can assist.
	Participant 3	13:18	I think it will be beneficial, but at the higher NQF level for now, so that you know we can get used to the digital ones before we can even move to the lower level NQF level.
	Participant 3	29:40	Yeah, it needs some supplements. This Bloom taxonomy.
	Participant 4	20:22	I think those elements will stay, but they are going to have to be transformed, not necessarily for the mode of delivery.
	Participant 4	21:37	Yeah, I I wouldn't say supplemented, but definitely they're going to have to be reframed to reflect. Yeah, yeah, they're going to have to be reframed to reflect.
	Participant 4	22:16	They are going to, like I said, they're going to have to be restrained to reflect the digital nature of society. That's how I would answer that question.
	Participant 5	9:45	So for me, it's a point of departure, not an end point.
	Participant 5	17:53	it would be quite useful, particularly if if we're now contesting the the Bloom's taxonomy, or at least the cognitive ones, in the in the digital space.
	Participant 6	15:28	It's too much of A risk, honestly. I don't think that is something that we could take on, especially now with the latest information of institutional types

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References	**Participant**	**Timestamp**	**Quote**
	Participant 7	7:24	Say, hey guys, we need to actually revise this thing. It's probably not going to serve us the way we would want it to in the next 5 to 10 years as as it would have with with every other framework that it is that we are. That we are following. Um. Yarn, I think it would be really nice if you had, I mean everything else is following a sort of community of practice route and I'm just thinking out loud. It would be really nice if your study at some point makes it through to a community of practice as well to say OK.
	Participant 7	13:27	So I think not to say that these are necessarily invalid, I think that there's probably a whole bunch more verbs that have to be either added or there has to be a reinterpretation of within what what we consider to be part of this digital space.

G7. Semantic Complexity of Exit Level Outcomes

Code	SC		
Question	What are your thoughts on using multiple verbs in exit level outcome design and its potential impact on the complexity of competency achievement?		
Keywords or Themes	• Agreement on complexity; Acknowledgement of confusion for lecturers/students. • Depends on the number and NQF level of the qualification • Extreme inconsistency; Verbal clutter; Unclear complexity; Institutional misalignment. • Outcome loading; Unpacking difficulty; Excessive assessment criteria; Testing complexity. • Redundancy; Verb clutter; Critically think as an example; Adding verbs for compliance/sake of it. • Single-verb preference; Loss of focus; Difficulty in assessing multiple competencies.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 1	12:33	Oh, what do you call the thing? If you write an outcome, you will not put in two or three verbs because then it becomes so loaded. How are you going to test that? Because in your ACS then you end up with a lot of associated assessment criteria at the end because you have to unpack that whole thing in how you're going to assess that you know it is. It doesn't work for me.
	Participant 2	6:28	Yeah, the exit level, I personally prefer it to be more focused, so I wouldn't go for more than one action item as such. So you kind of channel that learning and it's very specific.
	Participant 2	6:45	I find that where you would increase it and go to two and even sometimes three, then the actual focus of it is lost.
	Participant 4	44:13	Almost the same at all the in all the programs. Now how do you justify that?
	Participant 4	44:22	So how how do the people actually differentiate? How do they scaffold? If if you find the same verbs at all the NQF levels, then it means that whether we are actually assessing or teaching an NQF thing is exactly the same.
	Participant 5	17:13	well I mean in the one qualification it's like one exit level outcomes goes on for about three lines and it's got about 20 verbs in it and the other one has got five words with one of which is the verb you know so the so the way the way in which we're writing exit level outcomes and
	Participant 7	18:43	I remember it even got to a point where we would argue what does it mean to critically think you would write. You would write the word critically and you would shove it into a question or you would put it into an exit level outcome. We're like, guys, this is just are we being redundant here because you're just adding a verb now for the sake of.

G8. Frequency of Action Verb Use

Code	Fr		
Question	What are your thoughts upon seeing what the top ten most frequently used action verbs per qualification type are?		
Keywords or Themes	• Alignment with SAQA level descriptors; Mapping outcomes; Link to knowledge modules. • Ambiguity of 'demonstrate'; Contextual/experiential semantic differences; Disagreement with low-frequency verbs ('apply', 'manage'). • Linked to Level Descriptors; Two verbs are acceptable at the modular level. • Meaning and suitability of verbs are based on the user's contextual perception and history • Repetitiveness, Pitched too high • Understand" misuse; "Apply" limited scope; Exam-based assessment; Meaningless description. • Verbs inappropriate for NQF level; Accreditation flaw; *Understand* too low for Doctorate		
References	**Participant**	**Timestamp**	**Quote**
	Participant 1	8:55	Oh, it was so interesting because I looked at these things and can I just tell you one thing? I think I'm now pre-empting some of your questions, but I have to before I forget. The word demonstrate comes up; the verb comes up every time. But what does it really?
	Participant 1	9:21	Really means because you don't know. Demonstrate the so they can have it on a level 5, they can level 6789 and 10 demonstrate.
	Participant 1	14:47	Do you now get your verbs like apply in here? Why do you? Why do you get manage as a last verb? One of the last verbs because and identify.
	Participant 2	4:24	Yeah, when I saw this, I actually thought of the SAQA level descriptive.
	Participant 2	4:53	And in terms of how you would relate that or doing alignment of a program in terms of as you see the exit level outcomes, so the program outcomes and then mapping that to the actual.
	Participant 2	28:53	Yes, I would think definitely there is because especially in terms of like if you look for example the knowledge modules, within those knowledge modules you've got knowledge topics and those topics are designed in terms of those levels as well.
	Participant 3	22:43	Top 10 verbs on fluency apply to me, does not belong to a higher certificate. And demonstrate doesn't belong there.
	Participant 3	23:24	To me, doesn't belong there. It's on the higher NQF level. Evaluate is on a higher NQF level, very higher. Yeah, NQF level 9/10.
	Participant 4	48:07	I'm inclined to say when it comes to specific outcomes, it's fine to use the double, double, double. I almost want to say double A2 pronged approach to performance. Let's call it that.
	Participant 4	48:23	But yeah, yeah, at modular level. But when it comes to exit level outcomes, what is very interesting though is that if you look closely, you will see that.

Code	Fr		
Question	What are your thoughts upon seeing what the top ten most frequently used action verbs per qualification type are?		
Keywords or Themes	• Alignment with SAQA level descriptors; Mapping outcomes; Link to knowledge modules. • Ambiguity of 'demonstrate'; Contextual/experiential semantic differences; Disagreement with low-frequency verbs ('apply', 'manage'). • Linked to Level Descriptors; Two verbs are acceptable at the modular level. • Meaning and suitability of verbs are based on the user's contextual perception and history • Repetitiveness, Pitched too high • Understand" misuse; "Apply" limited scope; Exam-based assessment; Meaningless description. • Verbs inappropriate for NQF level; Accreditation flaw; *Understand* too low for Doctorate		
References	**Participant**	**Timestamp**	**Quote**
	Participant 4	50:05	Yes, yes, that that was something that I've noticed before that there's not much differentiation there. But so, so to answer your question, I think when it comes to exit level outcomes, it's fine I would say to have two.
	Participant 5	7:01	But just an aside, I'm still very aware of how often people put the word understand into the outcomes that they want instead of putting a verb or something similar, you know, a description that's meaningful. So, but I know that.
	Participant 5	7:36	So I think, yes, there are, there are, there are gaps and there are overlaps. You know, I I find apply kind of pops up all over the place. Apply is a wonderful word. You must be able to apply what you've learned. It comes here and there and everywhere. It's it. And then those verbs are.
	Participant 5	15:20	And attributes. And yeah, so we say you must be able to apply it, but what we actually mean is apply in the in an exam situation or in a project situation or something like that. I suppose we are in instances we probably are teaching the students project management skills and things like that, but I'm not sure that.
	Participant 7	22:05	I I just thought it was like ridiculously high. I was just like, why is it so repetitive?
	Participant 7	24:41	I think it's difficult to say how many, but it seems excessive. It seems it seems like a lot.
	Participant 7	26:38	If you can demonstrate, if you can demonstrate, I can demonstrate that I can bake a cake. What is the purpose of apply? Please tell me I can apply a recipe.

G9. General Comments

Code	GC		
Question	Are there any additional comments or points you would like to make on the future of learning outcome design for a technologically advancing mode of provision?		
Keywords or Themes	• Affective/Psychomotor domains; Non-traditional verbs (diagnose/manage); Transfer to work; Benchmarking complex skills. • Lack of official guidance; Next generation; Framework required due to rapid changes • Need for revision; Not serving future needs (5-10 years); Community of practice for framework building. • New/Advancing modes of provision (Hybrid, Hyflex); QCTO practical advantage; Work experience modules; Personalised pathways. • Preference for SAQA Level Descriptors; Critical Cross-Field Outcomes (CCFO) foundation; Rationale-driven design; Competency selection for program purpose. • Supplement with practical competencies • Supplementing Bloom's with SAQA Level Descriptors; SAQA descriptors are easier to understand; Need for full integration of SAQA descriptors into design/assessment.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 1	7:16	They use various ways and that can play a role as well, because every one of these words or terminology or concepts can be interpreted differently. You can't you get the ODEL. Or you get the ODL, then you get distance learning, then you get distance mode of delivery, and then you get distance mode of provisioning. And all of these play a role because there is a type of a cognitive.
	Participant 1	7:52	Meaning linked to this or the way you interpret it is also different. Now if you focus on open distance learning environment, it says remove all the barriers to learning.
	Participant 1	22:59	Your academics now that are the subject experts in the field, they are so old there is now you don't get a lot of juniors or you know entering the field.
	Participant 1	23:15	They might just use the stepping stone to get somewhere else to obtain your qualification and then go to the workplace. But the old people, like professors and so on, they rather would focus on research because this is where they generate research funds for them. It's an additional income.
	Participant 2	26:11	Is in exactly that because our programs, when I say our on the HE side, tend to be more theoretical as you mentioned. But when I looked and started to learn more about the TVET, your naked QCTO qualification, CTA programs, etcetera.
	Participant 3	16:23	Yeah, I think, and it can go back to where you say that we can supplement the bloom taxonomy. Maybe the bloom taxonomy can be supplemented by those level descriptors because they go hand in hand whether you like it or not.
	Participant 3	17:58	Like appearing on one section and they can, they can really like be integrated from your exit level outcomes, your specific outcomes, your assessment and everything. So they can sort of be integrated into the whole design.

Code	GC		
Question	Are there any additional comments or points you would like to make on the future of learning outcome design for a technologically advancing mode of provision?		
Keywords or Themes	• Affective/Psychomotor domains; Non-traditional verbs (diagnose/manage); Transfer to work; Benchmarking complex skills. • Lack of official guidance; Next generation; Framework required due to rapid changes • Need for revision; Not serving future needs (5-10 years); Community of practice for framework building. • New/Advancing modes of provision (Hybrid, Hyflex); QCTO practical advantage; Work experience modules; Personalised pathways. • Preference for SAQA Level Descriptors; Critical Cross-Field Outcomes (CCFO) foundation; Rationale-driven design; Competency selection for program purpose. • Supplement with practical competencies • Supplementing Bloom's with SAQA Level Descriptors; SAQA descriptors are easier to understand; Need for full integration of SAQA descriptors into design/assessment.		
References	**Participant**	**Timestamp**	**Quote**
	Participant 4	11:28	I've got the purpose of the program, so now I know where I want the program to go and then I look at my level descriptors to formulate my exit level outcomes to with with one purpose to unpack the purpose. So, in other words, I I take my cue. From the level descriptors and I say OK, which competencies do I want this program to develop in in the student? Some many institutions take all things I I don't necessarily.
	Participant 5	8:11	Applicable across the board, but you know in my field which training of health professionals, I'm not a health professional myself, I'm actually scientist, but there are things that you want them to be able to do which don't appear in any Bloom's list that you may see, you know things like diagnose or.
	Participant 5	11:16	It also always interests me that we always devolve back down to, well, not back down, but but to the the cognitive taxonomy and very seldom use the affective or the psychomotor. And that probably also relates to the fields we're in. But if you're thinking about medicine or, you know, physio and all.
	Participant 5	13:31	And we teach them teamwork, but we never use Bloom's taxonomy at the.
	Participant 6	6:52	So nobody actually gives us that guideline on the use of taxonomy, the Bloom's taxonomy for development of qualifications, exit level outcomes, review of exit level outcomes, none of that. So I think we are limited in that space. So this is a good topic.
	Participant 6	17:45	But I mean the next generation has a lot more hard work to do because of the rapid changes.
	Participant 7	27:37	It's changing so fast. Things are changing so fast and now we we said that we've got this like rigid framework. It's like the micro credentialing thing, like it's there. No one's making this thing alive, but it's it's a it's a parallel to be drawn. The same thing that's happening over there is is what should be happening here.

Appendix H: Editor's Report

LANGUAGE EDITING REPORT

THIS IS TO CERTIFY THAT

I, Dr Annatjie Erasmus (6102220081085), have performed the language editing of the Master of Education dissertation, titled: "The relevance of Bloom's Taxonomy for technologically aligned pedagogies in the South African Open Distance Learning Environment", provided to me by Andrew James Hayward (Student Number: 36634131)

Standard functions of the language editing process I apply, include:

- Sentence construction, word order and concise forms of expression
- General language- and higher education use-of-language conventions
- Typing errors and/or spelling
- Flow of thought, inclusive of the order and sequence of ideas in paragraphs to ensure the focus is on what should be emphasised or illuminated
- Sentence and paragraph lengths
- Accuracy of statements in the context of higher education legislation and quality assurance
- In-text referencing, citing and quoting and reference list
- Layout and general display
- General consistency and alignment with Unisa requirements
- Use of terminology aligned with standardised higher education practice
- Conceptual gaps and clarity as well as contextual application
- Avoidance of jargon and accepted academic writing conventions
- General grammar

I wish Andrew all the best with the last steps of completing his degree.

Dr Annatjie Erasmus

(HDE) Commerce IV (University of Stellenbosch)
National Diploma in Commercial Practice (Unisa)
Master's Degree in Technology, Commercial Administration (Vaal University of Technology)
D Phil in Science and Technology Studies (University of Stellenbosch)

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Date of report: 21 January 2026

Appendix I: Turnitin Report

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