RECONCEPTUALISING CURRICULUM AND ASSESSMENT IN UNIVERSITIES OF TEHCHOLOGY IN SOUTH AFRICA

by

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DECLARATION

I, Pulane Adelaide Molomo, hereby declare that this research project submitted to the Central University of Technology, Free State for the Degree Philosophiae Doctor: Educationis (PhD Education) is my own independent work; it complies with the Code of Academic Integrity, as well as other relevant policies, procedures, rules and regulations of the Central University of Technology, Free State, and has not been submitted before to any institution by myself or any other person in fulfilment or partial fulfilments for the attainment of any qualification.

Signed: 

Date: 30/06/2019

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"We are drowning in information but starved for knowledge."

– John Naisbitt

ABSTRACT

This study sought to examine lecturers' perceptions on curriculum design and modes of assessment within a differentiated system in universities of technology (UoTs) in South Africa. This research project is predominantly qualitative and adopts an interpretive approach during data collection. Selection of participants consisted of three purposively selected HoDs, fourteen lecturers from different faculties, most of whom come from industries, and twelve purposively selected undergraduate students. A purposive sampling technique was used in the selection of data. Data were collected by using an interview schedule for staff, observation, and questionnaires for students, including document analysis. A thematic analysis was used to sort data qualitatively into emerging themes. It was found that curriculum design and assessment, which integrates theory and practice whilst placing theoretical knowledge at the centre of the curriculum, contributes towards developing students' analytical abilities pertinent to social justice issues and innovative skills. The findings further showed the importance of recognising the uniqueness of the role of universities of technology in comparison with traditional universities in integrating theory and practice that enables the application of knowledge. This study concludes that students' success during the pedagogic encounter depends on meaningful engagement with content knowledge and meaningful ways in which students are assessed to enable them to develop analytical and creative thinking abilities and skills pertinent to solving complex problems and for stimulation of innovative thinking that lays the foundation for using thinking abilities to tackle social justice issues as well as being able to transcend and adapt to the 21st century innovative and knowledge economy.

Keywords: Analytical thinking, assessment, curriculum, differentiation, engaged students

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ABBREVIATIONS & ACRONYMS

Biomed:	Biomedical Technology
CHE:	Council for Higher Education
DHET:	Department of Higher Education and Training
DoE:	Department of Education
Engi:	Engineering
Fash:	Fashion
Graph:	Graphic Design
HE:	Higher Education
HEIs:	Higher Education Institutions
HEQF:	Higher Education Qualification Framework
HospM:	Hospitality Management
HRM:	Human Resource Management
Ind Rad:	Industrial Radiography
Log:	Logistics
NQF:	National Qualifications Framework
OBE:	Outcomes-based Education
PQM:	Programme and Qualification Mix
Rad:	Radiography
RSA:	Republic of South Africa
SAQA:	South African Qualifications Authority
Som:	Somatology
TheatD:	Theatre Design
UoTs:	Universities of Technology
WIL:	Work integrated learning

KEY CONCEPTS

Axiology: Philosophical values constituting knowledge

Curriculum: A term for all selected activities, transmitted and assessed in each programme.

Epistemology: That which constitutes authentic knowledge and how we obtain it

Mode 1: A mode of knowledge that is mostly disciplinary in nature and objective

Mode 2: A mode of knowledge that is mostly trans-disciplinary, heterogeneous and based on social experiences and beliefs

Ontology: That which constitutes reality and how we understand existence (reality approached from either subjective or objective realist ontology)

Pedagogy: A delivery mechanism of curriculum activities that constitute the teaching and learning situation.

CHAPTER 1 : OVERVIEW OF THE STUDY

1.1 INTRODUCTION

While universities are distinct spaces created to advance national priorities for the benefit of society through wider access, curriculum design and the modes of assessment are expected to relate to students' socialness and align to the differentiation and social justice agendas (Council on Higher Education [CHE], 2016). In the same vein, access to knowledge should not be for its own sake, but to liberate and develop students' intellectual abilities and prepare them for the 21st century world. Students thus need to access knowledge in order to have adequate tools to seek the truth rationally and to solve the problems that challenge their being. Thus, a sound curriculum design, accompanied by modes of assessment that enable students to engage meaningfully and to participate in activities that channel them to other types of knowledge (Wheelahan, 2012) should be pursued. The researcher has a Humanities and Social Sciences background. The researcher's conviction is that many people have been deprived of adequate access to meaningful knowledge due to previous skewed policies that regulated the past education system. The researcher's role as an ex-educator and currently a lecturer is stimulated by her passion in education, history, economics, philosophy, development studies and community development. The researcher's desire is to see a university producing knowledgeable, skilled and emotionally matured individuals who are able to learn more and to sift biases from facts to improve the world.

Reforms around curriculum design and modes of assessment in South Africa over the past decades created the impression that curriculum and assessment are pertinent in developing students holistically, and at the same time respond to national agendas by embracing principles of differentiation and social justice (CHE, 2016). Being guided by the social realist school of thought of the external existence of knowledge and its independence from human thought (Jasson-Vorster, 2010), it is critical that curricula open a doorway for students to access knowledge of a lasting value, and for students to be assessed in a manner that will nurture their abilities. In the same vein, the idea that knowledge promotes a better way of looking at reality is confirmed by Morrow (2007), who asserts that access to epistemic knowledge, described by Young (2013b) as

powerful knowledge, is to be taught and distributed in universities to promote holistic development, and to relate to human challenges.

Conversely, the changing nature of curriculum in serving priorities of any dominant ideology followed by any ruling party, was evident from the apartheid ideology which preceded a democratic ideology followed in South Africa up to 1994. During the apartheid era the system of education was dominated by the educator, and modes of assessment used excluded learners. With the dawn of democracy, a new approach to curriculum design and assessment through outcomes-based education (OBE) was introduced and became the driving force for transformation in higher education (Spady, 1988) and was followed by other approaches. Despite introducing different forms of assessment, the approach was focused more on the demonstration of skills to be performed than on the content or theory component, and modes of assessment were aligned to that objective. It is apparent that knowledge in the curriculum is used differently to achieve goals that are important to government and for economic gains. This study attempts to draw attention to the value of different theories that can influence curriculum design and harmonise the relations between everyday knowing and disciplinary knowledge, including modes of assessment that can be used to enhance students' thinking and their different abilities.

In highlighting access to content knowledge in the curriculum design in UoTs within a differentiated system in South Africa, the study touches on some on some of the theories underlying curriculum, development of thinking abilities, skills, the attainment of graduate attributes and modes of assessment that can improve learning. The literature touches on how the focus of curriculum design and modes of assessment used displaced content knowledge as the cornerstone of the curriculum which is pertinent in developing thinking abilities. Chapter 1 provides an overview of the study. It covers the background of the study, followed by the problem statement, purpose of the study, research questions, objectives and propositions, and an overview of selected literature. Covered in this chapter is also an overview of the theoretical framework, the research methodology and an outline on what each chapter will be presenting.

1.2 BACKGROUND AND CONTEXT

Prior to 1994, education policy in South Africa promoted discrimination and inequality in the education system, stemming from the Bantu Education Act, Act 47 of 1953 (Republic of South Africa, 1953). This Act resulted in a segregated education system which offered black people an inferior education compared to that of their white counterparts (Hartshorne, 1953). Similarly, the education system was fragmented and characterised by challenges in terms of training, lack of opportunities and poor access by black people to higher education institutions (Bozalek & Boughey, 2012). Consequently, with the coming of democracy, a complete overhaul of the education system, including curriculum change, was necessary to redress the wrongs of the past. After 1994, the Higher Education (HE) Act, Act 101 of 1997 (Republic of South Africa, 1997) promulgated legislative reforms which set the tone for the new political and socio-economic climate in South Africa. This act also reinforced the issue of reconfiguration of higher education and advancement of nation building following the implementation of the Reconstruction and Development Programme (RDP) (Makgoba & Mubangizi, 2010; Republic of South Africa, 1997). Emanating from these debates was the changing of the education system to advance development while responding to socio-economic needs.

As guided by policy on transformation post-1994, the driving force behind the transformation agenda was the elimination of all that was linked to apartheid and its accompanying inequalities in education, particularly in higher education (Allais, 2011). The White Paper on Higher Education and Transformation in South Africa thus became instrumental in facilitating change and transformation (DoE, 1997). Its aim was to respond to matters relating to equity and access by marginalised groups in HE. All of these, coupled with complications related to funding, necessitated a change in higher institutions, where curriculum would be used to drive the transformation agenda. The widening of access was also done in Britain. However, Ghana and Tanzania were reluctant to widen access (Mathekga, 2012). The process of transformation culminated in the provision of access to education to students from diverse backgrounds, which manifested in greater numbers of students accessing higher learning. The motivation behind this was to develop graduates who were well qualified for highly-skilled employment, and who could contribute to growing the economy (Mouton, Louw & Strydom, 2012; Vandeyar, 2010).

Consequently, the process of addressing problems relating to equity and access to higher education resulted in an overhaul of the size and shape of higher institutions of learning, and this involved aspects such as mergers, governance, and name and curriculum changes that were geared towards meeting the standards and trends followed globally, which also led to a decrease in the overall number of institutions of higher learning (Department of Education [DoE], 1997; Du Pré, 2009; Mouton, 2010). The other reason behind the overhaul was to diversify higher institutions of learning in order to distribute resources in an equitable manner as well as to open up opportunities for previously disadvantaged groups as outlined in the White Paper of 1997 (DoE, 1997).

This translated into 21 universities being reduced to 11 institutions, technical colleges being reduced from 150 to 50, and colleges of education being absorbed into universities (Du Pré, 2009; Mouton et al., 2012). The reduction in the number of HEIs in a way contradicts the principle of redress, equity and participation because it meant that the number of public institutions were reduced but the number of private institutions rose. To the researcher, the number of public institutions in terms of redress and the social justice agenda is far lower when considering the large number of people who were marginalised are still struggling to make ends meet. Notably, technikons, like other institutions of learning, were also affected by these institutional mergers and incorporations (DoE, 1997). Previously, former technikons had been established with the aim of imparting technological and practical knowledge (Du Pré, 2009). Their focus in technology was on specialisation and applied knowledge (Du Pré, 2009). In comparison with traditional universities, their programmes provided students with relevant skills suitable for managers, entrepreneurs and leaders in technology (Committee of Technikon Principals, 2003). Their focus was also on applied research, directed towards discovering the needs of society, while traditional universities focused mainly on theoretical research (Du Pré, 2004).

In alignment with globalisation and internationalisation, changes were implemented that affected technikons: international associations and other professional bodies could not recognise technikons because they were not degree-awarding institutions of higher education (Du Pré, 2004). Subsequently, on 1 January 2004, fifteen technikons were transformed into universities of technology (UoTs), finally being reduced to five independent institutions (Mouton et al., 2012; Du Pré, 2009). The Tshwane University of Technology, the Central University of Technology, the Vaal University of

Technology, the Durban Institute of Technology and the Cape Peninsula University of Technology were established (Department of Education, South Africa, 2002; Du Pré, 2004).

As a result of the extensive mergers that took place in higher education (HE) and the amalgamation of higher institutions of learning, changes had to be made to pre- and post-1994 policies, which had far-reaching consequences in terms of a new approach to curriculum and assessment (Allais, 2007). The magnitude of external forces, particularly from the USA after the technological excellence displayed by the launching into space of the world's first satellite, the Russian Sputnik, motivated the introduction of the outcomes-based approach to curriculum (OBE) by Spady, which spread worldwide (Hodges, 2007 cited in Blackmore & Kandiko, 2012).

In keeping with regional, national, and global trends, South Africa also adopted a new approach to curriculum which replaced the apartheid education system (Luckett, 2010). Politicians, unions, and the private sector, under the democratic and globalisation imperatives, thus channelled a movement towards the adoption of an outcomes approach to curriculum. Clearly, this approach to curriculum is the product of policy changes that moved away from authoritarian teaching, towards a situation where the learner is made the centre in the pedagogical encounter (Klopper, 2009). The OBE approach improved assessment, however, and in the process of addressing skills shortages in science, engineering and several professions inclusive of craft or skilled work, different forms of knowledge were conflated in the curriculum design (Kraak, 2006) and were supported by a performance-based curriculum through policies that were enacted such as the Higher Education (HE) Act, Act 101 of 1997 (Republic of South Africa, 1997). Obviously, this act not only facilitated transformation in the curriculum but also provided access and more opportunities for black people and other marginalised groups (Republic of South Africa, 1997) which was highly commendable.

Clearly, political ideologies and global trends influenced policies which culminated in reforms that resulted in the implementation of different curriculum designs and assessment in South Africa. Political and financial power showed a strong hand in the conceptualisation of curriculum such that the resulting crisis and criticism levelled at the design of curriculum and assessment in South Africa led to a number of curriculum changes. The first was the Outcomes-based Education (OBE) expressed in curriculum

2005, which was replaced by the Revised Curriculum National Statement (RCNS). Its flaws in assessment led to its replacement by the National Curriculum Statement (NCS), which also attracted criticism for being too broad, and which was replaced by the Curriculum and Assessment Policy Statement (CAPS) in 2012.

CAPS addressed some of the issues missing in previous presentations of the curriculum but did nothing to remediate the problems brought by OBE (Le Grange, 2014). Conversely, CAPS brought back content in the curriculum and highlighted different forms of assessment, yet thinking abilities are still not adequately developed due to unchanged ways of teaching and learning. Curriculum reforms were also done in HE and culminated in the review of a number of different programmes to address issues with regard to sizes, shape, physical access, and more importantly articulation, differentiation, and social justice (CHE, 2013). Despite changes made in the curriculum designs and forms of assessment in HE, global trends and pressure from employers still placed a demand on higher education institutions (HEI) to focus on behavioural attributes and aspects of skills needed for the economy (Healy, Mavomaras & Sloane, 2012). To that extent HE is no longer perceived as a public good but, has been turned into a commercialised skills-based establishment (Altbach, 2015).

The issue of preparing students for the world of work by placing emphasis on skills to be demonstrated is compatible with UoTs' niche when tracing their origin in the former technikons, because most of their programmes are profession-orientated and are aimed at producing graduates for the labour market. At the same time, higher education is expected to explore the dual modes within a curriculum, namely both theory and skills (CHE, 2013). Following criticism around the downplay of epistemic access, CHE introduced other reforms that extended degrees and diplomas by an extra year and gradually configured curriculum and assessment by amendments made on qualifications to enable epistemic access (CHE, 2013). The assertion is that disciplines should be powerful foundations of knowledge in which the content of different fields of study is located, in order to stimulate students' reasoning and abstract thinking (Young, 2009, 2013; Wheelahan, 2010). Furthermore, in terms of innovative thinking, universities need to play the roles they had been known for by producing knowledge grounded on concepts needed in the 21st century (Young, 2010), which implies stimulating the mind as well as laying a proper foundation for the social justice principles to depart from. The researcher is of the view that curriculum and assessment that enable students to enhance

logic and reasoning in order promote objectivity on how the world is viewed is needed by each and every nation, in all the sectors of the economy, professions and governments.

Clearly, development of students and objectives set in the curriculum will not be realised if they are not accompanied by sound and balanced modes of assessment. To that effect, assessment becomes a key component in driving the content and outcomes set in the curriculum to ensure that the objectives of teaching and learning are realised. Hale and Astolfi (2011) argue that quality learning is to be prioritised, so that student thinking abilities may be enhanced and assessment be used to measure their understanding. The poor development of thinking abilities can be traced back in the types of assessment that were encapsulated in previous curriculum structures which emphasised reciting and recall of content (Yates, 1966). Such assessment promoted short-term memorisation with little understanding of the subject and hampered meaningful learning. Arguably, modes of assessment that accompany reforms in the curriculum design are expected to maximise students' thinking abilities and not to repeat the past education system's mistakes in depriving students of knowledge. To that effect, Hale and Astolfi (2011) place emphasis on higher education to employ assessment strategies that enhance higher order thinking, so that they are able to analyse and view the world critically and are able to use the knowledge and skills to transcend to the 21st century space of knowledge complexities.

1.3 PROBLEM STATEMENT

The discourse on curriculum and assessment within a differentiated system in UoTs in South Africa presents a concern about the purpose of HE, particularly around the issue of preparing students for employability and educating them to think critically. The concern is on curriculum design and assessment which seems to focus more on the individualistic needs of employers and as such commercialised (Badat, 2009; Altbach, 2015), while students' thinking abilities are not adequately developed to be able to deal effectively with social justice issues and other complex problems of the 21st century. The importance placed on the economic activities and behavioural aspects of attributes needed in the marketplace are such that curriculum and assessment designs are

instrumentalised, and diverge from a differentiated and social justice agenda (CHE, 2013; Holmes, 2013; Jackson, 2016).

Clearly, the importance placed on technological advancement and economic progress by policy makers disrupts the role of universities in creating a sound social climate to nurture students' talent and unlock their potential to the fullest (Florida, Knudsen & Stolarick, 2010). The concern is that students are turned into commodities as job seekers and partially moulded citizens who lack independent thinking and critical perspectives into issues, including a lack of interest in socio-political issues that fall outside the scope of their careers (Fataar, 2016; Wheelahan, 2010; Young, 2008). The issue is that curriculum and assessment activities develop students for the immediate employment needs and do not develop students for future sustainable learning because they fail to develop deeper learning. As a result, students are also unable to engage effectively with their immediate environments (Giroux, 2014). Hence, curriculum and assessment in HE needs to be configured to address the different needs of the society (Healy, Mavomaras & Sloane, 2012).

Also, the manner in which forms of assessment are used fails to provide a pathway of differentiation in developing the mind towards becoming a powerful tool to be used to engage on a deeper level with reality and also social justice issues (Young, 2015). Quite alarming is the measuring of students' success based on the application of skills and greater involvement with industries (CHE, 2013), whilst issues of social justice and the redress agenda as espoused in White Paper 3 on the Transformation of Higher (DoE, 1997) are not met. Concentration seemed to be on the number of students who access HE, more than on the kind of knowledge they receive. As a result, specialisation in areas such as engineering, radiography and others that require an extensive mastery of foundational concepts of disciplines, seemed not to be sufficiently integrated, such that inadequacy around epistemological access is denoted as the failure of universities to maintain their key role of conducting teaching and learning in an effective manner (Balim, 2015). Surprisingly, the country laments the shortage of critical skills, yet there is no attempt made at curbing the problem from basic education as feeders for HEIs.

Although some articulation gaps have been addressed by introducing foundational programmes including the replacement of the modular system by semester or year subjects in UoTs, yet different ways in which students learn and acquire knowledge are

still not adequately addressed (Badat, 2009; Ogude, Nel & Oosthuizen, 2014; Wheelahan, 2010; Young, 2010). Yet the forms of knowledge in the curriculum have not successfully been dealt with because skills development, more than epistemic access, is prioritised. In the process of curriculum changes, facilitators in implementing curriculum and assessment changes to improve their practice are not given training to change their teaching methods. The problem is further compounded by the ineffective application of different modes of assessment, and as a result the maximisation of the development of thinking abilities is being limited.

The critical issue is the preparation of students to navigate complex situations. However, curriculum design and the accompanying modes of assessment used, do not create enough space to develop students adequately and differently. Also, the focus placed more on the development of skills, curriculum design and assessment tasks is such that these are low in realism aspects and are developing students poorly in the realm of analytical thinking and problem-solving abilities (Carless, 2015). Although the type of assessment used allows students a space to share their views, the knowledge students bring to class and the activities they can demonstrate, are not enough to broaden their knowledge and develop the logic needed for innovation, and neither are they sufficient preparation to cope with complexities of the 21st century (Maton, 2014).

The challenge is that assessment appears to focus more on the measurement of learning than on assessing content knowledge, and this does not translate to a change in thinking amongst students, or in learning how to tackle challenges objectively (Price, Carroll, O'Donovan & Rust, 2011). This raises a concern about curriculum and assessment which Karodia, Shaikh and Soni (2015: 6) describe as a defect and a crisis in South African HE which has taken approximately two decades before it can be fixed. Furthermore, in integrating technology to lessen the burden in regard to the lecturer–students ratio, use is made of multiple-choice formats that are reliable and quicker to mark; however, they reduce engagement and the ability to use knowledge in new situations. Summative assessment is also mainly conducted through a written mode and does not adequately reach out to students who are differently abled. Also, affective modes are also not adequately explored (Blackmore & Kandiko, 2012). Consequently, students possess skills and certificates, but they are unable to solve complex problems that require deep thinking, because the assessment designs fail to assess knowledge as an object of study (Joughin, 2009; Davidson & McKensie, 2009; Allais, 2010).

Assessment is supposed to enhance quality in learning through more engagement with the subject. However, due to the quality of students entering HE, quality of assessment is affected. As a result, the nature of knowledge being assessed does not sufficiently unlock innovative thinking because assessment is more on the lower levels of Bloom's Taxonomy: of recalling facts, understanding, explaining, for example, and less on innovative problem solving. This impacts on the type of students being produced, as well as on the throughput rate (CHE, 2013). Furthermore, assessment seems to lack in depth, because the focus is predominantly on skills, certification, compliance to internal policies, such that problem-solving skills are not fully developed (Carless, 2015). All these add to lack of students' holistic development which compromised adequate access to theoretical knowledge (Allais, 2010; Young & Muller, 2010).

Foundational principles that are not adequately emphasised also compound the crisis in curriculum theory and assessment, which in turn weakens the value of a university education (Burke, Scurry, Blenkinsopp & Graley, 2016). Through schooling and HE, a democratic society is expected to concentrate on socialisation of its citizens. This commences in childhood, and the end product ought to be citizens who have character, morals, responsibility, soft skills, ability to analyse situations, and the ablity to discern between truth and bias. However, the structure of the curriculum and modes of assessment being used pose barriers to students' achievement of multi-faceted traits, resulting in skewed development. Furthermore, curriculum is found not to be broad enough to focus on the academic and social aspects in order to produce multi-faceted citizens who are able to think critically (Ricci & Pritscher, 2015). These are shortcomings that warrant improvement.

Clearly, curriculum and the accompanying modes of assessment seem not to be effectively shaping individuals' attitudes and thoughts, such that crime and other social ills are on the rise because not enough attention is focused on the area of knowledge production that provides leverage for the development of analytical and methodological powers that would enable students to challenge biases in world (Soudien, 2010; Maton, 2014). The expectation is for curriculum and modes of assessment to be used in a manner that directs a pathway for differentiation and social justice, to equitably reach out to students from different backgrounds; however, this is poorly done. Furthermore, a crack inherent in the differentiated HE system in South Africa is the failure to adequately integrate social justice principles that are embrace Ubuntu principles in the

curriculum design and assessment (Chilisa, 2015; Lange, 2017). Also, pedagogy and assessment appear not to respond effectively to the current socio-economic challenges such as unemployment, poverty, good governance and lack of innovation due to the poor development of high levels of thinking.

All of the above issues have some implications for curriculum and assessment in promoting quality learning, enhancing critical thinking and embracing the differentiation and social justice agenda in South Africa.

1.4 RESEARCH QUESTIONS

The main aim of the study followed by the resea questions identified for this study are the following:

- This study sought to examine curriculum design and modes of assessment within a differentiated system in UoTs and to assess their effect on the development of students.
- In what ways have the past practices of technikons influenced the design of curricula and assessment at UoTs?
- To what extent does the nature of knowledge shape the curriculum design of various fields of practice in the preparation of graduates of UoTs?
- How do the curricula of different professional fields of study at UoTs prepare graduates for the changing market and employment?
- How do assessment and curriculum design in different fields of study at UoTs prepare graduates to address issues of social justice and other challenges related to the 21st century?

1.5 PURPOSE OF THE STUDY

The purpose of this study is to examine curriculum design and modes of assessment used within a differentiated system in UoTs and their effect on the development of students.

1.6 PROPOSITION(S) OF THIS STUDY

Propositions are concepts or statements that may be judged as true or false (Miller, 1990). The following propositions have been formulated for the research:

- The past practices of technikons influenced curriculum design in various fields of practice in UoTs.
- The nature of knowledge shapes the curriculum design and modes of assessment of the various fields of practice in UoTs.
- The curricula of different professional fields of UoTs prepare graduates for changing markets and employment.
- Curricula and assessment prepare students to deal with issues of social justice and other issues related to the 21st century.

1.7 AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to examine curriculum design and modes of assessment within a differentiated system in UoTs in South Africa, while the objectives of this study are firstly, to map out philosophies and theories underlying curriculum and to highlight the modes of assessment being used; secondly, to understand how past practices at technikons influenced how curriculum and assessment are designed in UoTs; thirdly, to analyse factors that affect curriculum and assessment designs; and fourthly, to indicate how diverse curriculum designs and modes of assessment impact on developing students differently to deal with issues of social justice, as well as other challenges related to the 21st century.

1.8 AN OVERVIEW OF THE LITERATURE

1.8.1 Market needs on the curriculum

The reform process in education can be traced back to the influence of global markets and the issues raised by labour unions regarding the acquisition of skills and what workers were able to do (Spreen & Vally, 2010), with less emphasis on the development of intellectual abilities. Without a doubt, a curriculum that placed an emphasis on skills was seen as the answer to the country's economic development and job creation needs,

skills shortage and literacy challenges (Shay, 2013). Economic and global trends were key in influencing educational curriculum designs and assessment during the apartheid era while also promoting an Afrikaner ideology of unequal economic opportunities (Horrell, 1968), which resulted in gross inequalities economically, socially, and politically, and which promoted rote learning. The researcher argues that curriculum reforms and the accompanying modes of assessment that focus more on economic trends and less on epistemic success, affect the maximisation of students' intellectual development and the opportunity to use knowledge innovatively.

The researcher is also of the view that each country has a sovereign authority and an obligation to examine the needs of its own society first, and to strengthen its curriculum design and the accompanying modes of assessment in order to respond to the country's challenges and skills shortages before fully adopting what international countries are following. As highlighted by Yates and Grumet (2011) and Biesta (2012), global trends influencing curriculum embraced a generic form thereof, focusing on competencies and lacking in meaningful content, and consequently giving rise to passive learning (Yates & Grumet, 2011; Biesta, 2012). Passive learning would not enable the development of intellectual abilities that are needed in the country to enhance analytical thinking abilities that contribute towards innovations for the benefit the whole society. Likewise, as argued by Young (2008) and Wheelahan (2010), access to knowledge which is not firmly rooted in disciplines takes away human power to think outside the box. Lack of a proper foundation of conceptual knowledge seems to be a crippling factor that delays students and individuals who enter HE from completing their studies timeously, and also hinders fair competition with other nations.

The focus on outcomes and generic skills is still embraced in CAPS as well as in curriculum reforms made in HE as such, a gap of knowledge has been created from the centre of the curriculum and assessment forms which weakens the development of analytical skills. The researcher is of the view that development of students' higher mental abilities correlates with knowledge anchored in disciplines as advocated by social realists including modes of assessment that activates higher order thinking. According to Drew (2013), the development of 21st century skills stems from building critical thinking. This is in contrast to a curriculum that focuses on display of performance rather than on the knowledge that is included in the curriculum itself (Kahn, 2015). This implies that knowledge that comes from the knowers (Maton &

Muller, 2007) or students is improved through the acquisition of structured, systematic knowledge embedded in the curriculum. The argument presented here is that not only procedural knowledge matters, but that disciplinary knowledge is equally important in terms of developing students' thinking abilities and their holistic development (Clarence, 2017).

Additionally, the claim is that an approach which uses disciplined, embedded knowledge has room for differentiated, diversified knowledge forms which give rise to a better curriculum and better-informed graduates (Muller, 2008; Young, 2008). Consequently, through the language of logic and scientific rules, students can accept, modify, or falsify their claims against the judgements of others and arrive at the truth (Mitra, 2016). The researcher is of the view that democratic values geared towards the promotion of social justice and knowledge that lead to factual truth, especially regarding higher education (HE), fall short of reaching the expected results. This is so because disciplinary knowledge that embeds the scientific approach to learning was overshadowed by skills-based knowledge in the curriculum (Muller, 2009). To this effect, this study seeks to bring attention to the fact that the nature of reality cannot be mixed with social actors' imperfect knowledge of reality.

1.8.2 The National Qualifications Framework (NQF) and the effects of the outcomes approach

The cascading effect of the dominance of skills over disciplinary knowledge in curricula in the new democracies also changed the articulation paths of students in the erstwhile colonies. In South Africa, the marginalisation of knowledge was orchestrated by a change towards the pursuit of skills facilitated by the National Qualifications Framework (NQF) (Allais, 2006). The National Qualification Framework (NQF), through the South African Qualifications Authority (SAQA) policy, articulates exit levels through measurable standards of knowledge, reduces the focus on theoretical knowledge based on disciplines, such as Physics, Mathematics, Biology, Economics and others (Allais, 2009). Consequently, this has resulted in the poor connection of knowledge to other aspects of reality, such as politics, society, and the environment, with serious implications for general development. This can be perceived as an imbalance regarding the teaching of content and skills which promoted passive learning.

Young and Gamble (2006) add that the qualification framework upsets the balance between formal and informal institutions in the sense that any form of knowledge, whether found at home, in the workplace, at schools or institutions of learning, was considered knowledge, which resulted in the conflation of knowledge forms and their roles.

Such a shift in the location of qualifications from traditional institutions, as well as their articulation in terms of market outcomes, has had a negative impact on the aim of education that seeks to develop students holistically. The NQF and the outcomes approach to curriculum are viewed as commodities of education because more students obtain more qualifications that do not necessarily translate into the valuable knowledge required for use in various situations (Young & Gamble, 2006). Firstly, the boundaries between the old and the new systems of qualifications are, comparatively speaking, narrow. Secondly, progression from one level to the next is not as easy as it appears. Thirdly, the selection and collection of units making up learning outcomes which translate into a qualification emerge as separate parts (Yates & Grumet, 2011). Yet qualifications are expected to represent the knowledge and skills, as well as the nature of learning acquired. To this effect, Young and Allais (2011) argue that qualifications should be rooted in knowledge and located in institutions.

Allais (2010) asserts that the NQF was designed to describe the broad structure of qualifications that are embedded within the national education system, aiming at setting standards and the level of entry and exit of academic qualifications. At the centre of the NQF is the national educational standard, which describes learning outcomes that are linked to assessment standards and emphasise the product of learning aiming at satisfying economic needs (Yates & Grumet, 2011). The outcome model and the national standards are identical and complementary and represent the radical replacement of a syllabus-led curriculum. They display a hierarchy of qualifications which are articulated through learning outcomes (Allais, 2010; Wheelahan, 2010; Young & Gamble, 2006).

The NQF, as part of the curriculum tool for reforms, became a critical tool in transforming education into a single framework, allowing students to move freely and to progress within the framework pathways. It introduced the principles of transparency, portability and the recognition of qualifications in a single qualification framework

(Young & Gamble, 2006). However, it failed to recognise the difference between the different forms of knowledge as espoused by the social realist theory in differentiating and acknowledging that one form of knowledge emerges from knowers (Maton & Muller, 2007) who are custodians of knowledge. However, as postulated by Maton and Moore (2010), knowledge cannot remain in the context where it was first located. The researcher argues that for graduates to be able to solve complex problems and bring social order, they need to acquire deeper knowledge that will fit the task. This is the reason why students need to be developed differently: to acquire both skills and thinking abilities. The assertion above is further supported by the assertion that some South African educational programmes are experiencing certain knowledge gaps due to a deficit in content and conceptual knowledge (Rusznyak, 2015).

1.8.3 The impact of transformation on content knowledge

Passive learning was a feature connected to previous education systems before 1994 whereby teaching and learning focused on the recall of information (Yates, 1966) instead of the deepening of understanding. The researcher argues that the curriculum design and assessment modes used then, did not maximise the development of thinking abilities of individuals who were not exposed to what Young (2008) terms powerful knowledge, hence the effects of the skill shortage and generally a slow socio-economic development of the country. The social realist stance, on the other hand, advocates for the development of thinking abilities and skills that are to be used to solve contextual problems. Undoubtedly, the post-1994 transformation discourse has had an impact on the knowledge base of the curriculum and has placed the child at the centre of education without consideration of the knowledge domain of education (Young & Allais 2011). Consequently, criticism has been levelled at this approach, and it has been suggested that qualifications should be rooted in knowledge and located in institutions (Young & Allais, 2011).

In the process of transformation and change, assessment activities that were conveyed in the curriculum in most programmes were made to bear instrumentalist characteristics in the sense of focusing on conditions of learning, and students having to exhibit the mastery of a skill through visible demonstrations rather than developing deep knowledge. South African higher education implemented an instrumentalist model

regarding curriculum and aimed to promote the economic aspect by producing students who would serve the market rather than overall challenges in their contexts (CHE, 2000). The democratic values that were geared towards the promotion of equity and access, especially in higher education, fell short of reaching the expected results, particularly in terms of social justice and academic knowledge. This is so because disciplinary knowledge that embeds the scientific approach to learning was eclipsed in the curriculum (Muller, 2009).

According to Blackmore and Kandiko (2012), most of the US Ivy League institutions, which follow a broad liberal education, view an instrumental employability agenda in the curriculum as limiting the educational aim of developing students holistically. The Ivy League institutions prioritise the value of learning and its application in a variety of contexts and reject the discourse of a limiting focus on the skills to be demonstrated. Research has also shown that in some institutions in Hong Kong, outcomes are drawn from educational aims which attempt to move away from focusing more on standards and generic skills. This is done to balance theory and practice and to maintain coherence between conceptual and procedural knowledge (Blackmore & Kandiko, 2012).

Similarly, the claim is that an instrumental approach to education, which raises education to the level of a commodity and reduces its value to its efficacy in terms of economic growth, cannot effectively promote social justice (Wheelahan, 2010). What is critical is the development of the intellectual disposition and reasoning ability, which involves strategic thinking, and a critical eye when unpacking literary works. The researcher argues that graduates who were exposed to an imbalanced curriculum and assessment experienced inadequate development of their intellectual abilities, because conceptual knowledge designed to develop logical reasoning lost its position and power in the curriculum (Carlson & Fleisher, 2002). As a result, priority should be placed on the development of thinking abilities in order that students can be ushered into the 21st century world which needs innovative, critical and analytical skills.

1.8.4 Assessment

While curriculum embodies the knowledge and skills that are driven through the teaching and learning process, assessment on the other hand, determines whether the curriculum provides the vital knowledge and skills of the discipline, and whether

students are developing the desired competencies and values (Webber & Tschepikow, 2013). As alluded to, past traditional methods of assessment that were used promoted passive learning (Yates, 1966), which hindered full development of intellectual abilities. Summative examinations with no opportunity for re-assessment were the main tool used to measure success. With OBE and the Revised National Curriculum Statement (RNCS), continuous assessment and feedback were popularised and used to measure students' success (DoE, 2002). This concept also gained prominence in HE. As a result, student success no longer relied solely on summative assessment. According to the researcher new forms of assessment opened up an opportunity for the use of different tools such as test, oral questioning, case studies, portfolios, assignments, projects, reflections and observations which may be administered formally or informally to students. However, what the curriculum places emphasises on, and poor ways of assessing students, may also limit the maximum development of thinking abilities. To this effect, Edward (2015) highlights the use of assessment in the classroom which is characterised by parity and meaningful participation to enable the development of thinking abilities as a form of empowerment in order to challenge biases and to improve human conditions.

1.8.5 Reforms in the curriculum and social justice

As postulated by Boughey (2008) the contribution of past experiences of poor exposure to knowledge, pertinent in enhancing logic, are the results of the number of students who are not able to complete their studies successfully. Furthermore, the inefficiency of curriculum design and modes of assessment which poorly develop logic and scientific ways of reasoning are also evidenced in the low number of students or academics who swell the ranks to become lecturers enrolling for postgraduate qualifications (Department of Higher Education and Training [DHET], 2012) and still conduct the teaching and learning in the manner in which they were taught and assessed.

The researcher is of the view that inequalities in the curriculum design and accompanying modes of assessment that do not effectively develop reasoning and analytical abilities of students, are barriers to the social justice agenda of knowledge that contributes in stimulating reasoning powers that assist in freeing people from biases and imperfections. Young (2008) maintains that knowledge that is selected in the

curriculum should be based on sound disciplines because of its liberating powers and its contribution to the development of thinking abilities. This assertion links to the idea which the social realists hold about the role curriculum and assessment should play in the development of cognitive abilities. Undoubtedly, the pedagogical interaction during the teaching and learning process seems to be the key to opening up meaningful engagement with the content. Similarly, Muller (2012) concedes that access to a systematic knowledge creates a thriving environment that contributes in reducing social injustice because it gives people the leverage to think rightly on how to navigate from difficult situations instead of yielding to emotions that bring chaos and disorder in the world.

1.9 THE THEORETICAL FRAMEWORK

This study adopts a social realism framework. Like other "isms", schools of thought or belief, social realism recognises the social nature of where knowledge is located (Archer, 2000) and where a synergy is created that allows knowledge to be advanced to a higher level knowledge form which embeds scientific elements. Social realism is a school of thought of sociology in education emanating within the sociology of education that was propagated by Durkheim, and it follows a non-empiricist investigation of reality (Archer, 2000; Bernstein, 1999). The theory becomes the basis upon which this study seeks to examine how curriculum and modes of assessment are designed or whether they need to be further improved in order to address the development of thinking abilities needed for innovation, and it is also used as a grounding platform from which the differentiation and social justice agendas are to depart. Social realism advocates for curriculum design and modes of assessment to be preceded by a formal, well-grounded knowledge of social reality above informal knowledge, because the latter does not follow well-known scientific principles that culminate in logical reasoning in the process of acquiring knowledge (Archer, 1995; Young, 2008). The study's interest is in the logical basis of formal knowledge which enables the development of intellectual abilities and the researcher concurs with the assertion maintained by Young (2008), that knowledge which provides logic and reasoning abilities is to be considered as the point of departure in addressing equality and social justice, and that there should be a link that connects knowers to knowledge (Maton & Muller, 2007). The researcher

is thus of the view that knowledge obtained from disciplines and being assessed effectively lends itself to the social justice arena, in the sense that it enhances reasoning abilities that enable society to question biases, maladministration and unbecoming practices that violate human rights.

Since the focus of this theory is on epistemology, on how we first know the world through interaction with others or socialisation through schooling or HE, the theory highlights the simultaneous understanding of the socialness of knowledge and its truthfulness by illuminating the importance of scientific knowledge not for itself, but for its application in a social context (Maton & Moore, 2010; Young, 2013b). In this regard, the social realist framework directs the path for curriculum design and modes of assessment to draw knowledge from disciplines and to be applied in social contexts for the benefit of the society, as well as to solve complex problems in an orderly and logical manner using intellectual abilities for the benefit of the society.

As such, curriculum and assessment designs need to consider how students are developed, hence the concept of developing skills and thinking abilities is the subject of debate in curriculum design and assessment matters. In the same vein, the theory acknowledges that the different beliefs that society possesses are not rooted in scientific theoretical principles and thus are unable to look into reality in an objective way. Hence the importance of epistemic access is illuminated through focus on content articulation in the curriculum design and modes of assessment, not mainly for the development of skills but for deeper learning, and for society to understand reality better because it is centred on the idea that knowledge is more than itself and has the potential to shift from whence it was produced (Maton & Moore, 2010).

Actually, the belief is that knowledge is real; it exists beyond our thoughts, independently of our social context but has to be used in the social context, and as such, disciplinary specialisation (Maton & Moore, 2010; Young, 2007; Maton, 2006) in curriculum design and the mode of assessment used to develop learning are significant and key in enhancing logic and reasoning. The theory has a progressive outlook in preparing students for the world of the 21st century because it recognises the differentiation and social justice agendas as well as accommodating subjects that do not have disciplinary foundations for students to be developed differently. Hence, the

curriculum designs and assessment of UoTs as tools for the transformation processes need to provide a space for students to be developed differently.

1.10 AN OVERVIEW OF THE RESEARCH DESIGN AND METHODOLOGY

Presented here is an overview of the research design and methodology which will be discussed further in chapter four.

1.10.1 Research design and methodology

A research design is a plan for a study that describes the type of study and the overall framework on how the process of inquiry is to unfold (Dawson, 2009). The design also reflects upon the theoretical framework that will be incorporated into the study and its knowledge claims (Creswell, 2014). As a result, the research design's point of departure is the problem statement and the evidence required to answer the problem statement, whilst the research methodology is a theory of how the research inquiry should proceed, which involves analysis of the assumptions, principles, and procedures in a particular approach to inquiry (Creswell, 2014; Dawson, 2009). It thus relies on tools or methodological processes that the study adopts for data collection, sampling or selection of participants, and data analysis. Depending on the type of tools that are used, the research methodology can be classified as either quantitative or qualitative (Creswell, 2014; Dawson, 2009).

1.10.1.1 Research paradigm

The study used a qualitative research design, guided by an interpretive paradigm. This was used in this study as a process of inquiry to obtain insight on how curriculum and assessment enable students' development. The philosophical orientation of this paradigm is that reality is constructed from people's lived experiences and beliefs regarding how they interpret the world by responding to qualitative questions (Creswell, 2013). Since HoDs and lecturers are affected and confronted by curriculum and assessment issues in different programmes aiming at developing students differently,

their views and experiences were sought in order to understand the topic from the context of their experiences and subjective individual descriptions, and how they communicate their experiences (Creswell, 2013; Denzin & Lincoln, 2012), which contributed towards an in-depth understanding of the phenomenon under investigation. Also, views of students who are the main beneficiaries of curriculum and assessment were sought by means of a questionnaire and by observing their interaction with the curriculum and modes of assessment in a classroom situation.

Associated with the interpretive paradigm is the descriptive narrative that yielded the type of information relevant to this study. Interviews were used as the main means of gathering data for this study. In addition, classroom observation, open ended questions, multiple case studies and document analysis were used (Maxwell, 2012). These instruments were used to obtain rich qualitative data from the participants in their natural settings. They provided a narrative and an in-depth description of their experiences with regard to curriculum design and assessment modes followed in UoTs. The use of different data collection instruments assisted in presenting the views of participants in a broader context (Patton, 2015; Creswell, 2013; Maxwell, 2012; Rubin & Rubin, 2012). An interpretive approach enabled the action taken in collecting data to represent the views of participants. Data collection was enhanced by using different instruments with the aim of representing participants' views in a broader context and to deepen insight about the object of study (Maxwell, 2012; Rubin & Rubin, 2012; Dawson, 2009).

The following section outlines the instruments used in this study, including the research approach, selection of participants, data sources, dealing with data, ethical considerations, the significance of the study, challenges, and chapter summary.

1.10.1.2 Research approach

Qualitative research is an interpretive approach which entails finding meaning in people's experiences of the subject through intense involvement with the participants (Creswell, 2014). This implies interviewing participants and probing to get their views about curriculum and assessment, and how these aspects influence students' development. Associated with the interpretive paradigm is the descriptive narrative that yielded the type of information relevant to this study. Interviews were used as the main

means of gathering data for this study. In addition, classroom observation, questionnaires, multiple case studies and document analysis were used (Maxwell, 2012). These instruments were used to obtain rich qualitative data from the participants in their contextual spaces. They provided a narrative and an in-depth description of their experiences with regard to curriculum design and assessment modes used in UoTs. The use of different data collection instruments assisted in presenting the views of participants in a broader context (Patton, 2015; Creswell, 2014; Maxwell, 2012; Rubin & Rubin, 2012).

1.10.1.3 Research type

As the investigation sought to obtain rich data and views of participants, a qualitative investigation design was followed because it deals with qualitative data and it aims at discovering underlying motives or desires, hence in-depth interviews fitted the purpose. At the same time, a qualitative research approach is especially important in education and behavioural sciences where the aim is to discover underlying motives of human behaviour (Creswell, 2013). Through such research, human behaviour can be observed and analysed to reveal the rationale which motivates people to behave in a particular manner. As such, interviews, observation, and open-ended questionnaires allowed the researcher to get closer to participants and to use all the senses in order to understand the phenomenon better. With this approach, experiences of knowers are seen as steppingstones towards knowing more about reality, and this is also the point of departure that is embraced by social realists who recognise knowledge where it is originally located (Maton & Muller, 2007) before its vertical trajectory.

1.10.1.3.1 Classroom observation

Classroom observation is another means of giving the researcher more power and authority regarding data collection. Anchored on the social realist grounds that acknowledges the link between different types of knowledge and expanding on knowers knowing (Maton, 2014a), the researcher was able to watch the behaviour of those under study in their natural setting and to see how curriculum and assessment influenced their development. Such a research approach enabled the researcher to see things

independently without being told about them, which benefitted the researcher greatly in terms of interpreting any observations that were relevant to the research questions (Creswell, 2013). In this study, a classroom observation was conducted in an Art and Design class, using an observation schedule focusing on three criteria, namely engagement, reasoning and use of scientific resources, where students critically discussed briefs as an assessment tool and reflected on their experiences through debates, discussions and critiques. This technique was used to understand the extent to which the curriculum design and assessment modes used, link knowledge of students to that of the content, to optimise their thinking abilities.

1.10.1.3.2 Open-ended questionnaires

Self-administered open-ended questions were designed to gather qualitative data from the students with regard to their experiences in dealing with curriculum and assessment matters. Eight questions were included, followed by blank spaces to allow the participants to motivate their responses freely and to provide additional information without the interviewer's intervention. The aim of using this approach was to get an understanding on whether content presented in the curriculum and modes of assessment impacted on intellectual abilities and growth.

1.10.1.3.3 Multiple case studies analysis

As postulated by Creswell (2013), multiple case studies analysis is a data collection tool that is used by the researcher to obtain a broader understanding of a problem from a relatively small number of individuals. The aim thereof is to probe more and to explore some differences and similarities of statements or views shared by other participants from the other cases that have been represented. They further bring a clear picture and a rich context that provide evidence about the practical reality on the issue being investigated by the researcher through the narrative of participants' voices and real events that have occurred.

1.10.2 Research methods

In line with the chosen interpretive paradigm, data were collected by using the following instruments: interviews and document analysis.

1.10.2.1 Selection of participants

This study employed purposive sampling. A sample is a small group of individuals representing the population from whom data is obtained (Creswell, 2013). The purpose of sampling was to represent the population from which data was obtained, to yield qualitative data and to gather quality evidence regarding that which is being investigated (Dawson, 2009). Challenges with regard to breakdown in communication, time constraints and lack of resources were experienced at the eleventh hour when contacting participants in other UoTs and this brought the number down to three UoTs. Participants selected consisted of fourteen staff members. Eleven of the fourteen were lecturers from different faculties from three universities of technology in the faculties of Humanities, Engineering, Management Sciences, and Health and Environmental Studies. The sample also included thirteen students in their second to fourth year of study. The three heads of department were all from industries, and, like other staff members, they were products of technikons who had started their careers as lecturers during the technikon era and had remained when technikons were converted into UoTs. As the aim was to obtain rich data about participants' views and experiences about the curriculum and assessment, all the participants selected provided rich information on the subject under study (Creswell, 2013).

1.10.2.2 Data sources

The participants who were selected for the study included lecturers, students, an acting head and heads of department who are implementing the curriculum and use modes of assessment in the process of developing students. In addition, the researcher made use of test papers, semi-structured written questions, policy documents and curriculum materials.

1.10.2.3 Data collection instruments

1.10.2.3.1 Interviews

An interview is a means of communicative engagement aimed at gathering information and a free flow of ideas (Silverman, 2013). It is an important tool because it allows participants to share, in their own words, their experiences, opinions and beliefs on how they experience reality, in the form of a one-on-one conversation with the researcher. The interview also has the advantage of allowing the respondent to clarify answers, as well as allowing for follow-ups on interesting answers (Silverman, 2013). Interviews were thus used in this study to get in-depth knowledge about how the curriculum in different programmes is packaged, including the modes of assessment that are used in the process of teaching and learning aimed at the development of students.

The researcher used a scheduled 20 to 40-minute semi-structured interview, consisting of pre-planned questions to interview participants. The aim was to gather data from lecturers and subject heads, who were interviewed in the hope of eliciting rich data with solid evidence. The researcher recorded the information and made written notes (Rubin & Rubin, 2012; Creswell, 2014). Open-ended questions were distributed to students from the second-year to the B Tech levels to investigate how they are affected by curriculum and assessment, and a classroom observation session concentrating on three categories was conducted in the Department of Art to investigate how briefs are conducted and how students engage with and support their arguments during the activity.

1.10.2.3.2 Pilot interviews

A pilot study was carried out to establish the credibility of the research by means of interviews prior to the commencement of the actual research. This was also done to ensure that the questions were clear, relevant and not repetitious. Some of the sub-questions that were not sufficiently clear were amended.

1.10.2.3.3 Document analysis

Document analysis is a type of qualitative research in which documents are interpreted by the researcher with the aim of giving further impetus to meaning regarding what is being investigated (Bowen, 2009). The researcher made use of public records such as policy documents and curriculum materials. The aim was to provide information on the existing gaps relating to curriculum and assessment designs.

1.10.2.3.4 Data analysis

Data analysis is a summary of data collected in a credible and accurate manner (Gay, Mills & Airasian, 2006). The researcher positioned herself as an insider concerned with the impact of curriculum and assessment in the development of students by interacting with others as they interpreted their views, and at the same time interpreted information based on the data generated. The process that the data analysis followed was transcribing, analysing, and reducing data into manageable proportions by clustering these into codes and sorting them into themes. The few tests that were made available were examined and analysed, as well as the contents of policy documents on curriculum, and government policies regulating higher education.

1.11 MEASURES FOR TRUSTWORTHINESS

In line with the chosen paradigm, the findings were verified using the following yardsticks: trustworthiness, credibility, transferability, anonymity, dependability, and confirmability. The purpose of comparing, verifying, and replicating information is to increase credibility. Therefore, the data gathered from interviews, questionnaires and documents were analysed to establish the confirmability thereof and to find commonalities and differences regarding the views of others.

1.12 ETHICAL CONSIDERATIONS

Ethical clearance was sought to conduct the study in accordance with the institution policy. Permission to conduct the interviews was also sought from the institutions concerned, and the researcher's objectives were also provided verbally and in writing

so that they were clearly understood by participants. Creswell (2008) emphasises the importance of treating participants with respect and informing them that the discussion will be kept confidential. Thus, the participants were assured of confidentiality verbally and in a written consent form, and only participants who had experience and information pertaining to the study were selected. Those who decided to cancel interviews were not persuaded otherwise. With regard to other participants who participated voluntarily in the research interview, only a confidentiality form was issued and signed, and copies given to those involved. Anonymity was also upheld, and no names were attached to the tapes or transcription; instead, the researcher used abbreviations such as PS accompanied by acronyms. Ethical considerations were adhered to in order to ensure confidentiality and sensitivity to the needs and concerns of the people being studied, as well as to establish a relationship of trust between the researcher, the study, and participants.

1.13 SIGNIFICANCE OF THE STUDY

This study emphasises the importance of developing students holistically and enhancing their thinking abilities by exposing them to a systematic knowledge by improving curriculum designs and modes of assessment used. Also highlighted was an integration of the social and scientific aspects of knowledge which resonates with the social realism stance. This implies that knowledge is recognised from where it comes, then develops, and in turn benefits those who produce it by strengthening and developing intellectual abilities to enable students to solve problems in their different contextual spaces, be this at their workplace or in their civic spaces. The study is an attempt to plead for policy direction with regard to curriculum and assessment matters and not to deviate from the social justice and redress agenda as espoused in the White Paper 3 on Transformation (DoE, 1997) by focusing more on skills for immediate employment and neglecting to develop students holistically. More importantly the study brings attention to the pedagogical interaction, to tap more into universally acclaimed concepts that create space for deeper engagement with knowledge in order to develop students' analytical and critical thinking skills. As cautioned by Youtie and Shapira (2008), if universities continue to focus on skills for immediate employment, they might turn into mere

knowledge factories and deny students the opportunity to use their skills and abilities in the 21st century complexities and knowledge expansion.

This study also seeks to reiterate what Young (2008) and Wheelahan (2010) allude to regarding the importance of access to powerful knowledge. The researcher is of the view that the systematic, objective kind of knowledge has the ability to develop student reasoning and thinking abilities. Thus, students' knowledge based on experiences, beliefs and views that are by their nature subjective, needs to be expanded through epistemic access, in order to unlock their potential. This is done by accompanying them through engagement in the subject matter towards the actual domain where scientific lenses are used to examine reality, and where logic and rational objectivity supported by evidence prevails. Consequently, students will have the ability to reason, select the best alternatives that will enable them to produce the best quality products, make sound decisions, use resources effectively and solve complex problems and issues of social justice for the survival of mankind. Furthermore, they will be able to function side by side with their global cohorts and earn respect for the manner in which they think, while their contributions to innovate will not be undermined.

Attention is also drawn to the importance of the relationship between theory and practice found in the curriculum designs and modes of assessment used in different fields of study, that sometimes seems to be conflated. The importance of maintaining the boundaries between skills and knowledge which graduates need equally, to enable them to be effective in the workplace and in the environment in which they live, has been confirmed. Although UoTs consist predominantly of programmes that are profession-specific, the study highlights the importance of conceptual knowledge as the foundation of curriculum design and assessment of professional qualifications in UoTs.

This study is thus significant in the sense that adds to the body of knowledge by highlighting the relationship and positioning of different knowledge types as well as the importance of assessing students in a meaningful way in order to develop innovative and analytical abilities. Other studies reflected on the positioning of knowledge types without emphasising the importance of conceptual knowledge in developing students analytical and innovative thinking. Furthermore, the study adds to the body of knowledge in sensitising educators and policy makers with regard to the idea that reality is comprised of different levels, according to which knowledge moves. In order to

enhance intellectual abilities, content knowledge needs to be prioritised and assessed as well. This study further adds weight to the complementary nature of knowledge types in curriculum design and assessment, which are both needed for a better understanding of the world, as well as for paving the way for the social justice factor in freeing the mind of biases in order to cope better with reality. Thus, development of intellectual abilities through a sound curriculum and the accompanying modes of assessment, including how knowledge is communicated differently to reach out to different students, becomes important.

1.14 CHALLENGES OF THE STUDY

Constraints of time, lack of resources, protocol e-mails that were not responded to, cellular phones that were not answered, connection problems to some who opted for Skype, and participants who were no longer available at the eleventh hour were critical factors in minimising the selection of participants. Only three UoTs out of a total of five were ultimately included due to the reasons stated above. After driving to reach participants in one of the UoTs, some participants who had initially agreed to take part in the study did not pitch up for scheduled appointments, whilst others cited examination marking pressure, even though dates for interviews had long been agreed upon.

1.15 CHAPTER SUMMARY

This chapter has provided an overview of this study. The chapter touched on the background, problem statement, objectives and research design. In addition, a brief literature review was provided, including a brief explanation of the theoretical framework chosen for this study. An outline of the methodology and instruments used to collect and analyse the data was also presented. The ethical considerations adhered to, including an explanation of the significance and limitations of the study, were also highlighted.

1.16 LAYOUT OF CHAPTERS

This thesis consists of six chapters, outlined as follows:

Chapter 1 provides an overview of the study in terms of its objectives and scope, and highlights the background, problem statement, aim of the study and definitions of some of the concepts, ethical consideration, limitations and significance of the study.

Chapter 2 provides an overview of the literature on curriculum and assessment, the emergence of UoTs, the impact of policy transformation on higher education, and the impact of curriculum and assessment on social justice issues.

Chapter 3 focuses on various theoretical frameworks and discusses the relevance of social realism as an overarching framework in this study. The chapter also covers the value of a philosophical orientation, common features between social constructivism and social realism, as well as some elements it shares with social critical realism.

Chapter 4 is devoted to the research design and related aspects. This chapter provides an outline of the framework behind the methodology chosen including the research paradigm, methodology, sampling, instruments, sources of data and processes behind data analysis.

Chapter 5 focuses on reporting the data and findings. The chapter covers a summary of the pilot study followed by the report on the main findings emerging from the different tools that were used.

Chapter 6 presents the strengths and limitations of the study, followed by a summary, discussion, and conclusions which are based on the findings. Also covered in this chapter are the suggested model, recommendations and implications.

CHAPTER 2 : CURRICULUM AND ASSESSMENT

2.1 INTRODUCTION

The previous chapter presented an overview of the study. This chapter provides a literature review on the curriculum design and assessment practices of universities of technology (UoTs). Covered in this chapter are policy changes and the impact of these on curriculum design and accompanying assessment tools, the emergence of UoTs, the placing of knowledge at the centre of the curriculum, the curriculum link with social justice issues, the role of assessment, and how students are developed to be able to cope with challenges related to the 21st century.

2.2 POLICY CHANGE AND ITS IMPACT ON CURRICULA AND ASSESSMENT

Policy was the main influence on the curriculum reforms that took place after 1994 in South Africa. Some of the reasons for the overhaul of policy were influenced by the global trends with an interest in economic gains to prioritise skills that could make graduates more competitive in the labour market (CHE, 2013). Also, political ideology followed by the leading party's democratic principles and policies on education placed a priority on political and economic goals. Other reasons for curriculum change centred on unifying the inherited segmented education system created by the past colonial and apartheid policies, and this facilitated a process of redress of past marginalisation and inequalities (DoE, 1997).

The process of transformation thus followed principles of social inclusiveness and participation, which led to an increase in numbers of admissions and enrolments of previously disadvantaged students entering higher education, according to the White Paper 3 on the Transformation of Higher Education (DoE, 1997). However, the recent draft National Plan for Post-School Education and Training (DHET, 2017) shows a change from the initial attention to social justice issues. The picture painted here indicates that curriculum is not something that can be classified as stable, since it is affected by national goals and trends that also occur in other global countries. However,

changes are not to be made hurriedly: they need to be thoroughly thought through and implemented in a manner that does not compromise the quality of education.

Similarly, constant changes in the curriculum that tend to confuse facilitators and affect the development of students may be avoided if all stakeholders are involved and different needs are addressed in curriculum. For example, in the process of educational transformation, constructive models on curriculum and assessment were introduced that did not yield good results, and upon being challenged by other stakeholders, were replaced by other reforms (DoE, 1997). Clearly, the impact of education over the past twenty years on curriculum and the accompanying modes of assessment, have destroyed the boundaries between types of knowledge and subjects (Hoadley, 2010). A balanced curriculum design which positions knowledge well may correct the error. At the same time, socio-economic challenges and questions raised in the academic space influenced other new policies to be enacted which have impacted on curriculum and assessment changes (CHE, 2013). However, the issue of epistemic knowledge that translates to access of more knowledge is still not adequately dealt with, since the priority is on developing students for the workplace. Hence, Gumede (2013) asserts that policies implemented in HE need to focus on enhancing quality in education. This implies that policies are to take cognisance of different types of knowledge in order to develop students holistically.

Numerous curriculum reforms and the accompanying modes of assessment are indications that previous curriculum reforms fell short in preparing students to become innovative, due to poor access to conceptual knowledge. Clearly, the problem of the value of conceptual knowledge at the centre of the curriculum and how it is assessed still needs to be examined, so that lifelong learning and not passive learning can be promoted (Carless, 2015). Since content knowledge is mostly needed in the curriculum, it needs to be assessed in a manner which would stimulate deep learning to enable students to compete well with their cohorts globally. According to Jansen (2005), a university loses its identity when it is no longer defined by its intellectual mission. Actually, part of the reason why students enter higher institutions is to access epistemological knowledge in order to enhance reasoning, and this marks the distinctiveness of higher education, as the type of learning found there is different from that found in informal contexts (Young, 2010; Wheelahan, 2010). What is implied here is that a distinct difference should be detected between a graduate with access to

epistemic knowledge and someone with no exposure in terms of reasoning abilities, problem solving, values and interaction with others.

Similarly, several variables have affected curriculum change, such as policy in bringing equality for all and making the curriculum responsive to the socio-economic needs of the country. Curriculum is still not broad enough to provide graduates with the knowledge needed in the professional and social space as well developing skills and abilities that enable students to view their world through a critical lens (CHE, 2013: 19). Such challenges are influenced by the interest and investment of the G20 countries that add weight towards the national skills development policy as a strategic objective, which influenced higher education to follow modernisation and a global competitive market approach to promote skilled labour (CHE, 2013; Vandeyar, 2010). To this effect, policy has directed curriculum to focus on skills to develop graduates that are highly qualified for high-skilled employment (Luckett, 2010; Mouton et al., 2012; Vandeyar, 2010).

Other than that, globalisation demands global partners to produce citizens who have acquired skills, competencies and attributes that are needed in the changing market economy. Hence, the mandate in South African higher education is to produce more technicians and technologists (Badat, 2010). The researcher notes that the government has the upper hand in making reforms to address national goals; however, the concern is that a broader consultation is not done with major stakeholders who are implementing curriculum and using assessment to measure students (Singh, 2011). This implies that sufficient consultation is needed to avoid imbalances in the curriculum and the accompanying modes of assessment that have placed the functioning of education before reason (Waghid, 2008). Inclusion of the voices of other professional stakeholders who are at the bottom end and are implementers of curriculum and assessment, are important to contribute ideas on the actual real gaps noticed in the process of teaching and learning: these gaps delay the country from successfully attaining its socio-economic goals.

Young (2011) posits that curriculum is the starting point for the improvement of teaching and learning. This implies that students' success and progressive development relies on the proper design of curriculum and modes of assessment that are used to promote learning. Previous reforms not only eclipsed concentration on knowledge that

necessitates liberation, but assessment strategies used also limited conceptual knowledge (Muller, 2000; Wheelahan, 2010). As postulated by Pillay (2015), curriculum incorporates a number of formal and informal activities that determine the success of graduates in terms of holistic growth and employability. These include content, units, timeframes, assessment, educational purpose, and ways in which the teaching and learning processes are aimed at contributing towards developing intellectual abilities and lifelong learning (Pillay, 2015; Carless. 2015). Values of the society in which knowing is constructed, including principles emanating from disciplines (Wheelahan, 2010), are also features of the curriculum. According to the researcher, knowledge of constructors as the stepping-stone for knowing the world needs to be expanded and linked to other knowledge types. As such, assessment is supposed to be used in a manner that would support this learning transition (Sambell, McDowell & Montgomery, 2013).

Nonetheless, as indicated by Leibbrandt, Woolard, McEwen and Koep (2010), South Africa is still lacking in critical fields of study, namely agriculture, engineering, health, and research, which includes scientists whose development relies on disciplinary knowledge. This is a problem that could have been fixed if curriculum opened up access to knowledge that benefits business and society. Furthermore, this knowledge would also be useful in elevating intellectual abilities to enable students to participate intellectually in political and moral deliberations (Muller, 2000; Young, 2008; Wheelahan, 2010). Together with this, the demonstration of skills and adaptations to market trends are important in the curriculum (Mitra & Gross, 2009). However, Florida, Knudsen and Stolarick (2010) argue that a university is expected to enhance innovation and intellectual abilities more than economic demands.

Generally, South Africa is faced with the challenge of promoting a democratic social transformation agenda which is rendered impossible if curriculum does not bring together the scientific and humanistic structures (Maton, 2006). Besides, as postulated by Florida, Knudsen and Stolarick (2010), universities have a wider scope and are not expected only to contribute in terms of technology and skills: yet this role seems to take precedence over other roles. The researcher is of the view that commodification of curriculum and its accompanying modes of assessment have not done anything meaningful in terms of addressing the plight of the poor, because the majority of the people are unemployed and are experiencing poverty and gross human injustices. As a

result, assessment should not be only about marks; it must also be used to relate and engage with contextual issues and to give students the opportunity to apply learned skills or knowledge to solve problems also in the civic space (Sambell et al., 2013).

Knowledge that can last beyond the classroom is a form of redress and social justice, and this implies that a balance has to be struck in order to respond to both social and economic issues to change conditions of the poor. To Young (2013a), knowledge in the curriculum increases students' intellectual prowess, level of morals, and the ability to come up with new innovative ideas that contribute towards solving current and future problems. The researcher supports the idea that knowledge cannot be acquired without being used meaningfully; hence, the acquisition of skills for the immediate satisfaction of employment is not enough to serve as sustainable knowledge. Appeal for knowledge of high value does not mean knowledge which is not relevant for use in the society: that would be a violation of the social justice agenda.

Innovations that would stem from developing minds are to be done to promote social change. Although social sciences subjects are horizontally structured, they are not without value or specialised knowledge (Hoadley, 2011) because a social scientist uses inferences drawn from disciplines, observation, and experiences to become an expert (Winch, 2010). Since the social scientist still needs to get to the bottom of the problem, experience would not be of much help, and a more intensive examination of theories will be needed, which this implies that epistemic access is more critical to address a broader scope of socio-economic problems. The apartheid education system denied many blacks the opportunity of being exposed to science, technology, engineering and mathematics (STEM) subjects because the then Native Affairs Ministry's segregation policies reduced blacks to mere labourers whilst their white counterparts could do mathematics which enabled them to become specialists (Clark & Worger, 2011). As a social justice effect, curriculum thus still needs to be broadened to make provision for the expansion of epistemic access in a flexible and reasonable manner so as to accommodate more students into STEM subjects in a flexible and a reasonable manner (Muller, 2015).

According to Maharaj and Mason (2016), the 20th and 21st centuries differ vastly, and the work environment needs more than just competence and lower level skills. Gaps still exists in the facilitation of students' accomplishment of goals which would

determine students' successful application of knowledge and skills into the 21st century world, in relation to problem-solving skills and analytical skills. The researcher is thus of the view that recent reforms in curriculum design, and the accompanying modes of assessment, do not adequately address some of the issues around differentiation and social justice (CHE, 2013). To the researcher this means the provision of education that removes poverty of the mind which limits intellectual development.

Comparable to some inadequacies in the curriculum and modes of assessment used, are the demands of the 21st century that require students to be equipped with knowledge that enables the intellectual development of students as well as assessment tasks that are increasingly linked to most real-world problems. This requires skills, technology, values, indigenous, disciplinary and world knowledge, whilst assessment ensures that meaningful learning occurs (Scardamalia & Bereiter, 2007; Carless, 2015). Previous curricula and modes of assessment in the process of preparing students were not adequate, particularly the social constructivists' scope of knowledge which focused on the situatedness, the immediate, and that which can be demonstrated. With the core mission of universities being the generation of new knowledge, the researcher is of the opinion that development of thinking abilities to stimulate intellectual rigour and debates surrounding the challenges that face mankind should be prioritised and modes of assessment need to promote authentic learning (Sambell et al., 2013).

The argument presented is that experiences and skills do not carry the same weight in influencing development, and neither do they all contribute to intellectual growth (Blackmore & Kandiko, 2012). Although public policy concentrates on economic growth above other needs, the assertion is that universities must not compromise their fundamental values or deviate from pursuing academic goals (Temple, 2012). As posited by Jasson-Vorster (2010), Archer's social realist framework provides a framework about social issues that needs curriculum embedding knowledge and skills to be used meaningfully, to be able to influence social change. To the researcher, this implies a trajectory towards eliminating misjudgements that threaten the systematic order of things. Ways of teaching and learning should then promote the principle of inquiry, which stimulate higher cognitive modes of learning (Vandeyar, 2010; Waghid, 2008). According to Demirci (2017:129), analytical and critical thinking abilities may be nurtured through 'meta-cognitive' assessment activities. This implies that, for universities of technology to produce new knowledge, they need to maintain their

academic goal of being the breeding models of innovation, by promoting knowledge and skills.

Arguably, countries like Japan, Taiwan, South Korea and China, whose curricula and assessment strategies focus adequately on content knowledge and stimulate high order thinking abilities, are doing well in innovation, and are leading in technological production because they maintain high quality education (Young & Gamble, 2006). The researcher is of the view that less access to knowledge which promotes innovation, and more focus on skills needed in the marketplace, compromises the quality of education and slackens the country's growth. It is worth noting that, while the White Paper on Post-school Education and Training (DHET, 2013b) places emphasis on skills development to satisfy instant labour demands, the White Paper 3 on the Transformation of Higher Education, (DoE, 1997) conversely highlights redress and social justice. However, redress and social justice are not seen to be addressed well because government prioritises the interests of industries due to their financial involvement in HE, whilst society is deprived of knowledge that stimulates innovative thinking.

Undoubtedly, the impact and progress that the policy on HE curriculum and its accompanying assessment is making is to be viewed around how assessment develops learning of a lasting value (Carless, 2015), and also, whether students are acquiring the required knowledge and competencies that enable them to navigate complex situations and use their skills and intellectual abilities to engage with their contexts. To that effect, a social realist argument placing emphasis on the social nature of knowledge makes sense because it recognises knowledge as socially constructed in practice but at the same it is assumes other qualities that are independent of human thought which assist society to use principles that relate to the truth or a level of objectivity in solving problems experienced in the real world (Maton, 2014a). Policy thus needs to consider curriculum and modes of assessment that promote sustainable learning which engages students (Sambell et al., 2013) and allows them to view their world critically and to relate with it.

Since assessment is not used adequately to develop independent thinking (McDowell, Wakelin, Montgomery & King, 2011), the researcher argues that curriculum and assessment need to be improved in order to promote social justice because students cannot be trained like machines that are regulated without developing independent

thinking. Besides, focusing mainly on skills needed in the labour market contributes to gaps that hamper the holistic development of students, who cannot apply ethics, values and principles that are integrated in knowledge found in the structures of disciplines (Wheelahan, 2010). As postulated by Maton (2006), conceptual knowledge is needed to complement procedural knowledge in the curriculum of higher education. Conversely, the researcher is of the view that UoTs have a mission to incorporate both types of knowledge well, in order to accommodate a dual-pronged curriculum, while assessment also needs to be applied meaningfully to embrace both theory and practice (Badat, 2009; Gamble, 2006). This implies that knowledge, and the value of those in the social space as core producers of knowledge, is critical. As maintained by the researcher, in developing graduates, facilitators should not to lose sight of the truth about the argument that is posed by (Wheelahan, 2010), that the objectivity of knowledge emanates from disciplines.

Clearly, the Higher Education (HE) Act 101 of 1997 (Republic of South Africa, 1997) makes allowance for higher education to meet all the needs of the nation, ranging from the economy to social, political and environment problems. This implies that all the needs should be embraced in a curriculum for students' holistic development, instead of limiting the approach by promoting solely the economic utility of knowledge and using modes of assessment that focus mainly on skills acquisition. However, the challenge for higher education, and UoTs, lies in how to transmit meaningful knowledge and skills, and in engaging modes of assessment that will allow students to participate in intellectual debates that enable them to transform their lives and contexts by accessing knowledge that promotes meaningful development and being assessed in a manner that promotes deep understanding and various dimensions of reality (Maharaj & Mason, 2016; Wheelahan, 2010).

The researcher acknowledges the use of technology in the niche areas of UoTs to make an impact in their region. However, their functions, like those of other universities, include three critical areas: research, community development, and teaching and learning. These are the most important aspects that also impact on the development of students. Thus, curriculum design and modes of assessment used are supposed to tap more into disciplinary forms of knowledge to enable meaningful learning, including learning of principles of investigation that will lead to increased research, optimise their thinking and assist them to use knowledge in an objective manner (Maton, 2014). This

implies the incorporation of assessment activities that promote innovative ideas (Sambell, McDowell & Montgomery, 2013) with regard to products students produce or design in demonstrating their understanding of the subject. As asserted by Carless (2015), this implies that more focus should be placed on developing intellectual abilities that will enable students to learn effectively and to use their knowledge and skills to design or create models in the fields of Engineering, Health Sciences and Art and Design, to mention but a few. To this end, Allais (2014) advocates for a balanced and diversified curriculum to develop emancipated and independent thinkers. Consequently, higher education needs to reconceptualise its purpose and content through a balanced integration of theory and practice (CHE, 2014).

2.3 THE EMERGENCE OF UNIVERSITIES OF TECHNOLOGY

Through policies that were enacted to respond to transformation and equal distribution of resources, universities of technology emerged. The White Paper on Education of 1997 (DoE, 1997) paved the way for transformation, diversification and widening of access in higher institutions of learning and the distribution of resources in an equitable manner. This opened up opportunities for previously disadvantaged groups by imposing changes in technikons and other higher institutions of learning (DoE, 1997). It may be said that erstwhile technikons were established to support skilled labour, in terms of technological and applied knowledge to produce technologists, technicians and graduates, to occupy middle level positions in certain occupations; they were further regulated by advisory boards (Committee of Technikon Principals, 2003). However, with the onset of globalisation and the drive towards internationalisation, the name "technikon" could no longer be used because these institutions were not widely recognised by international associations and other professional bodies even though they were also degree-awarding institutions, hence the change of name to UoTs (Du Pré, 2009). Consequently, students who wanted to pursue skills-related studies and who were not necessarily interested in entering a traditional university, were able to be absorbed in UoTs (Mathekga, 2012).

Notably, the democratic transformation process was instrumental in the configuration process that changed the landscape in higher education. This process culminated in twenty-one universities being reduced to eleven institutions, and fifteen technikons

being decreased to five independent institutions and six comprehensive institutions (Du Pré, 2009). The resulting changes, with the reduced numbers of technikons changed into UoTs, took place on 1 January 2004 (Du Pré, 2009). This process led to the establishment of the Tshwane University of Technology, the Central University of Technology, the Vaal University of Technology, the Durban Institute of Technology and the Cape Peninsula University of Technology (DoE, 2002). Even though the mergers facilitated a new path of transformation in HE, the historical reputation of UoTs as former technikons remained, with career-orientation and application of knowledge in solving problems remaining as their niche area; thus curriculum was used to ensure relevance and to fulfil the needs of employers (CHE, 2012). However, since they were also rated as universities, they were expected to produce research outputs and expose students to knowledge that conveyed principles of inquiry.

2.4 TRANSFORMATION AND ITS IMPACT ON CURRICULUM

Transformation in relation to curriculum resulted in both positive and negative changes. The assertion is that the emphasis on standards as the basis of the curriculum has led to the neglect of knowledge (Young, 2009). This is said to have compromised some of the values for which higher education was known, including the development of analytical thinking which is nurtured through knowledge found in disciplines. Such assertions oppose the focus that is placed on what students can demonstrate, and also indicates that deep learning and higher-level virtues are compromised (Maton, 2009). Approaches to a curriculum and assessment that accentuate that knowledge applied by knowers is more important than knowledge itself, disrupts a way for deeper learning (Maton & Muller, 2007) as result, focus more on skills than on professional knowledge does not meet the needs of different stakeholders (CHE, 2012). Although the boundaries of knowledge have been expanded, poor focus on theoretical knowledge and modes of assessment that are used do not seem to be assisting education in the total realisation of its aims, particularly in terms of other human dimensions such as social issues (Allais, 2007; CHE, 2013; Young, 2009). The implication is that the success of students and development depends on the acquisition of both knowledge types.

Curriculum which draws on knowledge based on skills or social experiences (Maton & Muller, 2007) rather than on concepts dominated curriculum design and assessment to

steer the global economy (Akmence, Akpinar & Akmence, 2015) while placing economic interests first, with other aspects being secondary. Society has different needs that all need to be addressed through curriculum. However, it looks as if business interests are prioritised more than other needs. According to Badat (2009), this approach reduced the value of the curriculum to usefulness for economic growth only, by distracting it from its other functions, especially its social role. Hence there are imbalances in the curriculum design and the accompanying modes of assesment, which seem to compromise the democtratic principles of liberation, equality and quality of life. The researcher maintains that knowledge based on concepts and principles enhances practice because it is impossible to put into practice that which you do not have knowledge of. For example, a poet would not be able to compose a poem before being conversant with the rules of grammar. In other words, theory complements practice and should be an integral part of, or a starting point in, the teaching and learning process. As such, curriculum which predominantly focuses more on skills than on content knowledge, is inadequate (Bernstein, 2000).

The assertion is that prescribing to students how to learn contributes towards only a partial understanding of the total world surrounding them (Waghid, 2008). The contention is that practices put greater emphasis on the visible exhibition of knowledge than on knowledge which articulates vertically. The emphasis on exhibition of knowledge has changed the structure of the curriculum dramatically because theoretical knowledge, which has for centuries been the cornerstone and foundation of true knowledge, has been displaced (Wheelahan, 2010). A further factor is also the weakening of traditional subject boundaries and the blurring of distinct classifications between conceptual and mundane knowledge due to the poor specification of content in the curriculum (Young & Muller, 2010).

Other educationists and theorists cited in Wheelahan (2004), such as Karl Maton and Basil Bernstein, argue that an ontological change in curriculum and pedagogy in the 20th century moved away from focusing on knowledge, focusing more on outcomes and competencies, which elevated assessment in the curriculum. The impact of this change is such that emancipatory pedagogy has been removed from the centre, including knowledge as the object of assessment (Muller, 2000; Wheelahan, 2010), and it is asserted that the emphasis on skills downplays teaching and learning to people's own construction of knowing and execution of tasks (Alexander & November, 2010). This

tendency to place the focus on skills rather than theory stifles analytical and creative thinking because the nature of outcomes is such that it segments knowledge and ignores the vertical nature of disciplines (Daniels, Lauder, Potter & Hartshorn, 2012).

The issue for Young (2013) is the movement of knowledge in the curriculum and the pedagogic encounter beyond everyday knowledge, which limits the development of higher order thinking skills that promote innovative thinking. As a result, students are disadvantaged and denied the opportunity to develop logic and higher levels of reasoning capacity (Wheelahan, 2007). As pointed out by Singh (2011), the approach to curriculum and modes of assessment are an indication of a global influence, with imported strategies, yet global countries have good infrastructure and their socio-economic conditions and demographics differ vastly from the situation in South Africa. The researcher argues that this is done to strengthen economic interests through curriculum, whilst limiting intellectual dialogue that can benefit the socio-economic context of developing countries. Moll (2004) warns that the broad responsibility of curriculum and assessment activities should not be narrowed down to economic demands at the expense of intellectual rigour. Such an approach seems to reduce the current, tacit approach to the curriculum to a narrow approach, which according to Allais (2012), reduces proper links between curriculum and knowledge such that curriculum concentrates on products and structure, to the extent of mixing education with economy (Allais, 2014a).

Generally, the role of higher education through curriculum and assessment should be seen as a means of developing intellectual growth and skills among students, as well as responding to some of the needs of society (Barnett, 2006). Pedagogy includes the act of teaching, which engages students to acquire skills, knowledge, values and ways of learning to make meaning of the world (Harlen, 2010). Other than that, the world economy also needs graduates who can function internationally. This implies that students should not be limited to working with tools in their specific fields without being grounded in conceptual knowledge that enables them to apply what they have learned in totally new contexts in their communities in order to solve other problems that are beyond the context of work. Consequently, most qualifications should embed conceptual knowledge, qualifying students to transcend to higher levels of cognitive skills in addition to the skills that characterise their professional paths (Wheelahan, 2010). It is against this backdrop that the reconceptualisation of curriculum, as well as

looking at reliable methods of assessment to meet the challenges of the 21st century, becomes critical (Muller, 2000). To this effect, Allais (2014b) proposes a curriculum framework which is grounded in conceptual knowledge rather than one that is based merely on standards.

2.4.1 Policy effect on curriculum and the advancement of an ideology

The current curriculum model, which is backed by policy and has attempted to address the ideology and needs of the economy, characterises the new democratic dispensation (Luckett, 2009). At the same time, the Higher Education (HE) Act 101 of 1997 (Republic of South Africa, 1997) outlines the type of students who will be appropriately responsive to labour demands and so satisfy the market. This is an indication that the government prescribes what ideology should prevail in the cause of education in general (DoE, 1997). The policy is critical in terms of its prescription and review of programme offerings in institutions of higher learning. However, in the South African context the reality is that, beyond economic issues, there are multiple other issues of development, such as innovation, social issues and poverty that also need attention (Badat, 2009). It seems, however, as though they are given little attention in the curriculum space. The expectation is that UoTs, as centres for human transformation, need to empower students so that they become better citizens who uphold high ideals and who, at the same time, contribute to growing the economy.

It is also claimed that over the years, HE has exerted an influence as mandated by different stakeholders, including the promotion and selection of knowledge that the state and other role players needed to advance (Blackmore & Kandiko, 2012). For example, during the apartheid era, a racially discriminatory and unequal system of education for the different races was advanced. Morrow (2007) postulates that the failure of curriculum in South Africa is the result of prioritising material gain, which is not tied to context, to the detriment of abstract concepts. The bone of contention is that there seems not to be enough critical, emancipatory learning to empower and develop students to become more critical of their contexts so as to improve some of the inequalities and problems that continue to exist (Maharaj & Mason, 2016). This implies that curriculum and modes of assessment disadvantages other agencies in the social structure.

The implication is that for graduates to have access to factual knowledge, all curricula must embed occupational curricula and theory that are characterised by a scientific and systematic ordering of information (Muller, 2000; Young, 2007; Moore, 2007; Maton, 2000; Wheelahan, 2010). Seemingly, as asserted by Morrow (2007), the most crucial challenge has been and still is access to knowledge embedded in concepts and principles which transcend context, implying that this must not be neglected in the curriculum. Admittedly, the more individuals advance in knowledge, the more they follow an upward path far removed from everyday experiences, which can make it possible to deal meaningfully with numerous challenging aspects in the world (Pinar, 2010).

2.4.2 Graduate attributes and work integrated learning (WIL)

According to Giroux (2002), implicit in the government agenda is the support of business ideas for national economic growth. For this reason, measures were taken global for universities to introduce graduate attributes as components of the curriculum to produce employable graduates. The implementation of graduate attributes across universities, and particularly in universities of technology, was to address complaints levelled by the employer about the skills lacking among students who were entering the job market (CHE, 2013). Although the generic graduate attributes contribute additional soft skills aimed at moulding the type of graduate needed by the labour market, some studies have shown gaps in the skills that students acquire in institutions of learning, which may mean that labour demands are not fully satisfied (Griesel & Parker, 2009). The labour market platform is to be understood not only as a space for technological application of skills, but also as a space for constant research, analytical and strategic thinking and decision making to sustain production. In this regard, in order to do research and apply strategic thinking, a measure of foundational principles and conceptual knowledge are essential.

The Central University of Technology is known for its innovation hub, while other innovations will be needed in the future. If curriculum is not designed in a manner that promotes cognitive abilities, future developments that could benefit society will not be possible. To this effect, curriculum and assessment need to prepare students to be able to change social conditions. However, it looks as if the question of knowledge in the curriculum will take more time to be corrected. Ballim (2015) indicates that the recent

reforms in curriculum have not adequately resolved the systematic knowledge needed to enhance cognitive qualities. To the researcher, this means that the pace of preparing students to enter the 21st century space, which requires the development of critical thinking and problem-solving abilities, is constrained and not adequate, and has implications for unequal competition with cohorts from other global countries whose students have had all the opportunities to be developed better.

What the reforms have highlighted so far, is curriculum that enables students to become critical risk-taking citizens (Nussbaum, 2011). However, the question is whether students have been prepared to think critically whereas the scaffolding has not been done adequately, and this further implies that students are not adequately prepared to compete with their cohorts globally. The following are some of the graduate attributes that employers are looking for: good communication in English; comprehension of the business and working environments; proficiency in the use and production of field-specific and general knowledge; problem solving, self-confidence, self-efficacy and autonomy, to name but a few (Coetzee, 2012; Griesel & Parker, 2009). All of these attributes are important, and they can better be realised if they can be illuminated by more by critical thinking abilities (CHE, 2013).

Although graduate attributes encourage skills that students may use for the successful completion of their studies, that does not necessarily translate into the development of logic or analytical skills needed for their success as graduates. In addition, from the observation of two groups of first year Education and first year Community Development Practice students with whom the researcher interacted, there are still some grey areas with respect to the analysis of texts, commitment to social responsibility in the civic space, and the ability to cope with various social challenges. A holistic approach to graduateness that moves beyond employers' expectations will remove the limiting and narrow focus on market needs. Attributes such as moral leadership, cultural and emotional intelligence, as well as global citizenship will enhance social justice in diversified aspects of reality (Coetzee, Botha, Nienaber & Holtzhausen, 2012). Furthermore, the workplace requires graduates who are creative and professional, and who possess an increased knowledge of their work (Coetzee, 2012). However, the criticism levelled against graduates by employers is that HE fails to produce graduates who can deal effectively with workplace complexities, such as innovation and problem solving (Coetzee, 2012). The world and the workplace need people who are able to

discover things on their own; recognise risks and challenges; and produce systematic, correct solutions to challenges, as well as innovative strategies. Thus, more graduates who can influence the world positively and save business costs, thereby contributing towards sustaining the organisation over the long term, are needed (Griesel & Parker, 2009).

Work integrated learning (WIL) in most programmes in UoTs is used to link the curriculum to the world of work. What is learned in practice narrows the gap of poor understanding of theoretical knowledge, and therefore a proper link with practice needs to be ensured (Pink, 2005). For example, fields of study such as Radiography, Industrial Radiography, Fashion Design and Clothing, as well as Graphic Design – as they were previously called before re-curriculation – make more practical sense. They allow students to learn more, engage at an emotional level, and in the case of Design and Clothing, develop attitudes towards some clothing brands and designs, for example. Practical engagement is credit-bearing and forms part of the curriculum. Students are placed in industries, health, education or other institutions to strengthen the base of their knowledge by applying it in practical contexts and by engaging in public participation for social learning (Davids, Theron & Maphunye, 2009). This further serves as an opportunity for students to look at material gain in the workplace, whilst engaging on issues of social justice and responding to social and technical needs. This implies that curriculum and the manner in which students are assessed should aim not only at producing graduates for employment but also at producing balanced, informed, engaged and well-rounded citizens.

The implication behind WIL resonates with the social realist stance around the idea of knowledge being applied in a social context to solve society problems. Students' partnership with communities through community engagement or service-learning initiatives is to be viewed as a promotion of an authentic teaching and learning situation which can contribute to a transformational change to all who are involved (Bryson, Furlonger & Rinaldo-Langridge 2015). Conversely, these initiatives serve as building blocks towards recognising the principle of social justice by opening up an opportunity to relate with the society, learn from society and also assist where possible by applying knowledge and skills that have been acquired. Admittedly, through WIL as part of the curriculum and modes of assessment in UoTs, this area of developing graduates who

are responsible and who show interest in societal need and moral consciousness need to be further strengthened (CHE, 2016).

2.5 PLACING KNOWLEDGE AT THE CENTRE OF THE CURRICULUM

The researcher argues that a university, regardless of whether it is a UoT, a traditional or a comprehensive university, is a space that is expected to harness students' intellectual abilities and to package the curriculum and assessment in a manner that will also empower students in doing research that requires systematic knowledge. To that end, students need to be exposed to declarative knowledge which draws from the objective nature of the physical world and its rules, in order to present society with factual knowledge (Young, 2013a) that will further be used in the community. Concentrating only on economic growth causes higher institutions to displace knowledge based on disciplines in curriculum design and assessment, and such a shift has serious implications for the discipline-based knowledge which universities are expected to promote, to generate new knowledge (Moore, 2009; Young, 2013a). Content knowledge belongs at the centre of the curriculum to strengthen intellectual objectivity needed to prepare students for complex problems (Kumar, 2007). Similarly, Morrow (2007) also supports a systematic type of learning which improves reasoning but argues that epistemological access is obscured when too much emphasis is placed on the learner.

Notably, true learning recognises students' social experiences: this is sharpened when they interact with other students through curriculum and assessment, and this in turn encourages students to use team work to explore different group dynamics, to express their thoughts and to learn new ideas through justification of facts, as well as to reproduce new knowledge to be able to move beyond the confines of their limiting contextual terrain (Borich, 2007). The researcher believes that a sensible way to enhance learning may be to engage students to reflect critically on the different activities presented in their daily classroom encounters, in conjunction with scientific knowledge. Furthermore, creative designs and products that students produce by connecting theory and practice need to be further encouraged to prepare students for more meaningful innovations that are needed by the society. In addition, recognition of the objectivity of the curriculum is supported by the claim that universities, including UoTs, should

remain devoted to inquiry and scholarship because they are institutions of learning that embed academic practices or disciplines founded on well-structured forms of knowledge and high standards (Waghid, 2008).

Boughey (2005) indicates that the role of epistemological access is to bridge the gap between the way in which students and lecturers view the world from a critical viewpoint. The implication, as suggested by Boughey, is that the curriculum needs to be developed in such a way that epistemological access occurs in the form of critical engagement which is driven by assessment and deep reflections on content knowledge. The researcher is convinced that students should be able to engage, reason, interpret their social conditions and employ rules of nature that can help to find answers to their situations by connecting the abstract with everyday experience and this is needed in HE. Similarly, Scardamalia and Bereiter (2007) support the idea of intellectual dialogue to enable students to create and acquire knowledge which will not only make them workers, but also analytical thinkers – unlike the situation that prevailed in the erstwhile technikons.

Access to theoretical and abstract knowledge is one of the conditions for democracy in which society engages with all of its surroundings, searches for solutions and critically analyses things that are not done well (Bernstein, 2000; Moore, 2007; Wheelahan; 2010). It seems as though knowledge matters if it has a pragmatic value in terms of the context. Such a view considers the value of knowledge when applied to a specific situation, and the tendency is to value practice more than the body of knowledge embodied by the profession. However, the contention is that like a researcher, the practitioner holds a job which requires individuals to think in innovative ways, make critical decisions and use logical inquiry to improve practice (Songhkram, 2013). This kind of thinking is critical toward building a solid foundation for the development of students.

The centrality of disciplinary knowledge, which embeds a set of principles, is critical for students' intellectual development (Wyse, Hayward, Livingston & Higgins, 2014). The assertion is that theoretical or disciplinary knowledge is attributed to power and intellectual ability, in order to transform and reduce the problems faced by society (Waghid, 2008). To this effect, universities are viewed as places which have been set aside for inquiry and scholarship, to assist in solving a variety of human problems rather

than simply being confined to addressing economic problems. However, it appears as though the curriculum followed, avoids focusing on the promotion of inquiry. The argument raised is that poor development of analytical thinking limits inquiry and may result in the failure to produce a high percentage of graduates with high intellectual capacity, who are able to reason, critique, make wise judgements, and produce new knowledge (Badat, 2010). University programmes are aimed at preparing students to solve problems in their careers through the acquisition of knowledge, and both hard and soft skills are necessary. Thus, content-driven teaching has greater value in improving knowledge retention because of its inherent inquiry characteristics (Lanning, 2013).

Knowledge is internalised as individuals move from a process of inquiry to justification and validation of the truth. Although the contextual base from which knowledge emanates cannot be underestimated, the claim is that a knowledge-based curriculum is founded on historical bodies of scientific knowledge that have been produced over centuries (Allais, 2007; Young, 2013a). Thus, students need to be prepared in a manner that will help them to understand complex problems and come up with explanations that that are in synergy with reality as found in the social domain (Giloi, 2016; Steyn, 2012). As a result, in order for students to be able to cope with global challenges, they need to draw from disciplines because knowledge about practice is limited to certain situations (Scardamalia & Bereiter, 2007).

According to Morrow (2009), the content of the curriculum needs to be carefully selected and sequenced, based on both disciplinary and situational knowledge, because knowledge is at the core of the curriculum and has its foundation in professions. This implies that professionally oriented knowledge is recontextualised into a curriculum in the form of theory (Morrow, 2007). The rationale for providing students with disciplinary knowledge in informing and complementing professional practice in the workplace is because it is sensible. This view is also supported by Young (2008), who highlights the importance of integration and connectedness of different forms of knowledge. The more knowledge of scientific laws is infused into the curriculum, the more holistic growth amongst students can be enhanced. Pillay (2015) adds that the success of graduates not only depends on the academic programmes but also includes issues of values, quality, employability and holistic growth. A curriculum which encourages different modes of learning is endorsed in the White Paper on transformation and needs to be followed in UoTs (Soudien, 2010). This starts with a

curriculum and assessment that does not focus mainly on developing skills but rather on a curriculum that promotes students' engagement in knowledge that enhances logic.

Maton and Moore (2010) postulate that not all claims of knowledge are equal. The indication is that some forms of knowledge are more epistemologically powerful and provide a stronger and firmer grip on the world than others. Thus, as producers of knowledge, higher education institutions of learning (HEIs), like UoTs, play a crucial role in leading the way by providing students with knowledge that is based on disciplines and is verifiable (Wheelahan, 2010; Clegg, 2016). Constant changes in society, especially in the workplace, also demand complex knowledge derived from disciplines for research to improve on practice in order to boost productivity as well as to change workers' attitudes. UoTs as universities are thus expected to provide students with more access to disciplinary knowledge and to employ assessment practices that enable access to deeper knowledge (Moore, 2007; Muller, 2000; Wheelahan, 2010).

The above assertions further invoke the idea that without the proper positioning and serious recognition of disciplinary knowledge, interconnectedness between the two forms – procedural and epistemological knowledge – may be rendered ineffective. The claim is that experiential knowledge is socially derived and places emphasis on skills as being the most important knowledge in the 21st century era (Nowotny, Scott & Gibbons, 2003). However, procedural knowledge is not recognised in traditional scientific academic fields in relation to their epistemological hierarchies that are reinforced by principles and abstract knowledge (Morrow, 2007; Muller, 2008). A further argument is that the dominance of practical knowledge over other types of knowledge limits epistemic access and makes knowledge relative (Nowotny et al., 2003).

In the context of UoTs, for example, the practical application of knowledge, referred as mode 2 knowledge, is dominant and is supported by a curriculum which reinforces the demonstration of skills. However, this form of knowledge cannot function effectively without mode 1 knowledge. Mode 1 knowledge is strongly aligned with scientific disciplines, and follows scientific rules (Muller, 2000). It is for this reason that social realists oppose emphasis on competencies as opposed to knowledge because they view knowledge as distinctive and as an intellectual nucleus of the curriculum (Muller 2000). On the other hand, mode 2 knowledge is found to be lacking in epistemological richness of scientific evidence and reliability, but its social value, as practised by different

communities of practice, cannot go unnoticed. Both knowledge types seem to be important because the context cannot be the only source of knowledge even though it is the location where the knowledge originates. It is thus important to move from the known context to the unknown abstract where science is used to validate the truth (Nowotny et al., 2003).

2.5.1 Recognition of the unique role of each knowledge type

Winch (2010) asserts that in order to achieve quality and an effective way of teaching, it is important to first introduce students to concepts and methods of inquiry before introducing the knowledge of practice, because concepts deepen knowledge. In order to enhance students' learning and make it more relevant, however, the process needs to be broadened to include the practical skills found in their known social and cultural worlds (Entwistle, 2000). That can be made possible through the methods used in assessing students. Drawing from Entwistle's example of foundations of understanding a biology syllabus, the starting point of imparting knowledge is concepts and principles before practice. According to Brookhart (2010), this course of action accommodates higher-order thinking, which connects coherently to practical aspects and valuable experiences that have sustained societies.

Throughout the past years, HEI have outlined academic excellence in terms of knowledge production rather than outputs or student performance (Du Pré, 2009). The excellence alluded to was established because theoretical knowledge was recognised in the curriculum. This implies that a good foundation was laid for intellectual development. Maharaj and Mason (2016) claim that during the process of teaching, meaningful knowledge and skills need to be communicated, that will allow students to be able to cope with different aspects in the world. The adoption of global skills that translated into outcomes and competencies to redress past inequalities in South African has failed to achieve its aim; instead, gaps have been created in other knowledge forms (Spreen & Vally, 2010). The curriculum is thus expected to prioritise disciplinary knowledge so that expert knowledge and skills are not simply limited to contributing towards growing the economy, but also help to address social issues (Van Schalkwyk, 2002; Badat, 2010).

2.5.2 Differentiation of knowledge in the curriculum

The researcher is of the view that multi-faceted problems facing humanity continuously today, namely poverty, unemployment, inequality, crime and climate change are interdisciplinary issues, requiring complex and unusual linking of disciplinary and other forms of knowledge (Council on Higher Education [CHE], 2013). The challenge regarding the curriculum is that it requires HE to reconceptualise its purpose and content through a balanced integration of theory and practice (CHE, 2013). As postulated by Moore (2007), knowing should not be conflated with knowledge in the curriculum design and assessment strategies used, because these two perform different roles (Moore, 2007). This implies that curriculum needs to be differentiated conceptually with high sequencing, and contextually with less sequencing (Young & Gamble, 2006; Wheelahan, 2007).

In UoTs, most fields of study embed different knowledge types that can best carry the differentiation mandate forward in accommodating the social element of knowledge, as well as that which lies beyond the social realm. This implies that UoTs, with their integration of theory and practice, are in the right space to usher students into the 21st century; however, more still need to be done. As posited by the Council on Higher Education (2000), such a differentiation in curriculum and assessment approaches is pertinent to reach out to different cognitive levels of students and meet varying needs of society. However, the challenge lies in the curriculum design and assessment strategies that do not balance the two types of knowledge, as greater reliance is still placed on experience and senses, which limit the progression of knowledge to a higher level of validated premises (Bernstein, 1983; Maton & Moore, 2010). As outlined in the policy, reform on differentiation in the South African post-school higher institutions of learning is expected to produce both career and disciplined-based curricula (DHET, 2013).

In addition, poor differentiation of knowledge in the curriculum is corroborated by Badat (2009) and Ogude, Nel and Oosthuizen (2014), who confirm that differentiation of knowledge remains a challenge because different institutions have different purposes or missions in prioritising certain forms of knowledge. It is further asserted that differentiation of knowledge in the curriculum prioritises specialisation in a skewed manner to increase skills for modern liquid economy competition on a global scale

(Ntshoe & Selesho, 2016). Consequently, some students are left behind because the curriculum does not include diverse students appropriately, and also resources are not adequate to provide for them. The researcher's view is that the impact of such processes has led South Africa to adopt a curriculum which does not fit well with its contextual challenges and historical background, in comparison with most global, developed countries that have good physical and social infrastructures and large-scale, thriving economies. This seems to benefit larger economies at the expense of developing economies. Hence the suggestion for HEIs is to follow a balanced curriculum that embraces both theory and practice (Nussbaum, 2006; Badat, 2009; Young & Muller, 2008).

For example, HIV/Aids as a social issue, needs to be examined by means of both a scientific and a social approach. This does not mean that knowledge emanating from different experiences and cultural backgrounds is not important. Rather, it needs to be improved by means of tried and tested principles (Wheelahan, 2010). People's experiences and their coping mechanisms that can be shaped by scientific claims are recognised. Alves (2015) warns against the sole application of everyday knowledge due to the danger of developing individuals with a limited view of reality. The mutual benefit of science and society communicating with each other through people constructing knowledge, while applying scientific rules to their contextual space, creates an upward trajectory in terms of apprehending reality (Garner, 2008). This creates the co-existence of different knowledge types to establish a relationship between science and society (Pratt, Keys & Wirkus, 2014). Thus, curriculum should consider developing students to be able to use different modes of knowledge, should realise the limitations between different kinds of knowledge, and should draw principles and theories from disciplines as they progress from secondary to tertiary education (Young, 2008).

In moving students along a path of known experiences to the unknown world entrenched in disciplines, students' learning is enhanced and brought closer to the nature of rationality located in disciplines in a vertical manner (Maton, 2014b; Clarence, 2017). For example, the social problem of eliminating poverty or creating employment to eliminate inequalities will not rely only on varying human beliefs and experiences in the process of finding answers, because this is a complex matter. It warrants a lengthy process and a detailed analysis of the truth. It goes the route of operational laws of

science in finding causes, falsifying and affirming claims in a systematic way. It weighs options, makes comparisons, and selects possible solutions that may lead to the answer based on facts and other scientific claims. In the view of the researcher, this is a necessary process that needs to be complemented by social perceptions and experiences on the subject

The discourse on vertical and horizontal knowledge brings in some new nuances in recognising the relationship between theory and practice because the dominance of the horizontal approach to learning involves a segmental selection of knowledge which limits the development of knowledge beyond the unscientific level (Bernstein, 2000). According to Muller (2008), a concept-based curriculum represents a hierarchical abstraction type of knowledge which is characterised by a level of conceptual difficulty, whereas a contextually-dominated curriculum represents occupations that are specific and segmented that address a context and specific purpose. Nevertheless, policy regulations for the Programme and Qualification Mix (PQM) throw weight behind differentiation in UoTs to address inequities of both professional skills and academic knowledge (CHE, 2016). To this end, it is proposed that the occupational fields and their qualification mapping should promote a curriculum which adequately embraces both theoretical and practical structures (Muller, 2008).

2.5.3 Balancing theory and practice

A two-way perspective to curriculum can work as a vehicle to serve as a transformational mandate in HE, towards a diversified mode of learning in catering for varying students' needs and changing situations as a form of differentiation (Singh, 2008). Knowledge based on disciplines in the curriculum design needs to be applicable in the social context in order to prepare students for industry and society (Pratt et al., 2014). UoTs have the ability to carry both forms of knowledge simultaneously to complement practice by designing curriculum and infusing assessment strategies that can illuminate knowledge located in disciplines. With critical pedagogy embracing diversified principles, epistemological access is a possibility which will turn students into active citizens who will use their knowledge to complement skills, in order to solve a variety of problems, including social challenges.

Notably, theoretical knowledge has an advantage over procedural knowledge through its systematic way of looking at phenomena before arriving at an answer. However, parallel positioning of forms of knowledge is essential to understanding clients' challenges, including finding ways of improving a profession (Connolly & Harms, 2012). Indeed, the relationship between theory and practice is important because graduates cannot be limited to the world of work; they also occupy a space in the social and civic sphere where they can use their knowledge and skills to improve communities (Bridgstock, 2000; Wheelahan, 2010). In order to balance the equation and to maintain lifelong learning, it is asserted that curriculum must not be polarised and that it must develop both the intellectual and practical capacities (Young & Muller, 2010; Muller, 2009).

Employability and being a graduate cannot be confined to the situation, especially when considering the complex issues surrounding the 21st century (Yorke, 2006; Griesel & Parker, 2009). This implies that being a graduate should involve more than the acquisition and demonstration of skills for employability because the economic growth of the 21st century relies not only on the accumulation of capital but also on knowledge. Lately, most companies focus on aspects such as inquiry, which are important in keeping abreast of changes in order to contribute to innovations alongside staff development. It is for this reason that higher institutions of learning are expected to assess complex issues that relate to problems in their social domain, thus students need to learn and be able to form factual arguments and to analyse texts (Dilley, Kaufman, Kennedy & Plucker, 2015). Thus, skills alone are inadequate in terms of preparing students for the complex outside world.

The contribution made by social constructionism in terms of highlighting the active participation of students cannot be ignored, including the recognition of students' cultural backgrounds which they bring to the teaching and learning environment. However, the contribution of social critical realism affirms the idea that knowledge is fallible and thus grows upon new assertions. Such pronouncements involve challenging a myth or belief which has been adopted as the norm, and by distinguishing between the pre-scientific and scientific nature of knowledge, errors are eliminated through logic and proper judgement, and the value of conceptual knowledge can be increased (Maton & Moore, 2010). The implication is that HE has a duty to develop the higher-order cognitive abilities of students so that the products produced can best solve problems in

the workplace and in their immediate environments (Pratt et al., 2014; Griesel & Parker, 2009).

Swart (2010) highlights the importance of linking theory with practice. This implies ensuring that knowledge continues to adapt to future needs and is sustainable, which will maintain a proportional curriculum which proceeds through a theoretical route before landing on the practical professional structure. The process necessitates a coherent relationship between the two knowledge forms. The idea of integrating theory and practice (Swart, 2010) means linking the content and contextual structures of knowledge and specifying the steps to be followed to make sense of the way in which the abstract and physical worlds occupy a dual form. Furthermore, it is important to represent this two-pronged nature of knowledge in the curriculum, in pedagogy and in assessment practices employed to convey knowledge (Swart, 2010). An integrated curriculum, which embraces both discipline-based and practical knowledge, is thus suggested as a merger of the propositional and procedural knowledge, while still recognising their distinctiveness (Maton & Moore, 2010; Young, 2007).

Moving knowledge from subjectivity to a level of logical objectivity requires content knowledge because complex tasks and workplace technologies require higher-order skills (Brookhart, 2010). In fact, balancing curriculum to embed different types of knowledge in UoTs towards promoting equality and quality life of a society should not be taken lightly. To this end, Gamble (2006) and Wheelahan (2007) advocate a mixed curriculum, which consists of both approaches, thus satisfying both the economic and the social needs of communities. Additionally, the guidelines of the National Qualifications Framework, Act 67 of 2008 (Republic of South Africa, 2008) aim at producing a career-oriented *and* research-guided person, and this needs the two approaches to be infused into the curriculum. According to Muller (2009), evidence of the dual purpose of knowledge is elucidated, where students are expected to learn theory and apply it in the form of practice teaching, whilst in other programmes theory is applied in practical situations through work-integrated learning (WIL).

Assessment tasks that placed emphasis on the relevance of the behaviourist element of construction of knowledge in real, visible situations have resulted in a decline in standards (Knight, 2002). However, assessment that is knowledge-based promotes higher order thinking and communication skills, (Noguera, Darling-Hammond &

Friedlaender, 2017), and has the potential to raise standards of learning. Hence, it is argued that principles behind disciplines are necessary to increase quality in teaching and learning, and they thus need to be prioritised because they are not tied to a specific context (Maton, 2014). According to Maton (2014), knowledge based on disciplines also allows for the creation of new knowledge due to its capacity to create relationships between dissimilar things. In doing so, it gives students a broader view of the real world. Equal emphasis on the acquisition of knowledge and skills is thus important in order to prepare graduates thoroughly for the outside world where the abstract and the concrete co-exist (Pratt et al., 2014).

Dall'Alba (2009) contends that conceptualisation of a profession develops through the integration of both skills and knowledge. Even though the distinction between the conceptual and the occupational routes in UoTs is evident, there is a need to balance curriculum design and assessment in some of the fields of study (Thompson, 2000). Students therefore first need to be exposed to objects embodying declarative knowledge before acquiring skills or performing tasks. Although constructivist teaching methods have contributed towards information retention by departing from known experience, the separation between theory and practice does not increase deeper knowledge (Wehbi, 2011). This implies establishing a curriculum which enables a link between students' experiences of what they know, knowledge that they learn through curriculum, and being assessed to engage more deeply with this knowledge (Beck 2014; Muller 2014). This implies that in the context of UoTs, the different structures of knowledge, namely the hierarchical and horizontal levels, must be differentiated in the curriculum and assessment practices to reach out to a diversity of students. The gap between the two knowledge forms may be bridged if they become integrated and interdependent (Alves, 2015).

2.5.4 The development of thinking abilities

Critical inquiry and its contribution to systematic ordering of knowledge are supported by the claim that through curriculum and assessment, students' abilities to think, solve problems and cope with life's challenges are developed (Pratt et al., 2014). However, this will not be done successfully if curriculum and assessment focus mainly on one form of knowledge only. Theoretical knowledge complements procedural knowledge

to gives impetus to effective critical thinking, which makes the analysis of information through structured thinking possible (Lai, 2011). Procedural knowledge, which emphasises certain principles of good thinking and assessment, also plays a role in elucidating rules of logic, principles of dialogue and arguments. However, a critical thinker needs more than that; he/she needs to possess main concepts to be able to differentiate between different kinds of concepts. This is where theoretical knowledge bridges the gap in terms of knowledge which cannot be found in the procedural structure, to strengthen thinking abilities (Masek & Yamin, 2011).

Young (2013) and Wheelahan (2010) are of the belief that striving for knowledge is one key element of deepening learning and understanding which allows people to reflect critically on reality. Thus, curriculum needs to set the stage for creating a platform to encourage analytical thinking embedded in theoretical or conceptual knowledge so that students will be imbued with the ability to engage critically with their physical world and produce proper solutions to the challenges facing their world, while accumulating the relevant skills needed to advance economic growth. For citizens to be able to take part in civic activities, analytical thinking abilities need to be sharpened (Carlson & Fleisher, 2002; Kumar, 2007; Pratt et al., 2014).

Thinking abilities are stimulated by theoretical knowledge because high-level thinking involves a high level of reasoning capacity. This occurs when conclusions are drawn based on logic and requires systematic steps to be followed before conclusions may be arrived at. Critical thinking is at the centre of most intellectual activities where the argument is developed, strengthened through evidence, evaluated and interpreted, and conclusions are drawn while creating knowledge links between ideas that bear a similar meaning (Pratt et al., 2014). Linking includes combining parts that do not necessarily connect (Hurst, Wallace & Nixon, 2013). This trend is normally observable in research findings, for example, and in compilations of policies that follow a coherent line of activities from the rational to comparisons with existing knowledge on the subject, to findings, until a conclusion is drawn. The expectation is for HE to lead in ensuring critical learning and through this to show a commitment towards democratic citizenship.

Curriculum and assessment must cultivate the capacity for critical examination of the world, and the mastery of this ability requires learning those concepts that will steer the capacity to make judgements and to make informed decisions based on facts and other

information, to bring about accurate answers to problems (Nussbaum, 2006). This is what participatory democracy needs from its citizens. However, the contention of Maton and Moore (2010) is that critical judgement does not involve one distancing oneself from experience or non-epistemic values. It requires learning from experience and the social context by engaging with others and using logic. In this way, students may be developed intensely and broadly in different aspects.

Similarly, according to Darling-Hammond (2006), rethinking pedagogy regarding the current challenges facing the world is a necessity. To this author, a change that includes the development of higher-order thinking involves inquiry, engagement and critical reflection on social issues among students that could contribute towards restoring man's dignity. It is asserted that higher-order skills involving critical thinking, self-directed research and inquiry focus on the process and progress of development, which resonates with a conceptual methodology instead of a competency approach (CHE, 2016). This implies that to master the skills of analysing, evaluating or critiquing a text, as well as breaking the whole into smaller pieces and gaining a deeper meaning or understanding, indicates the need to be grounded in theoretical knowledge. Notably, the mastery of these higher-order skills is very important in the process of teaching and learning, as, when they are mastered, they assist greatly in addressing complex problems (Paul & Elder, 2007).

When solving problems, one moves from a non-ideal situation to new possibilities that lend themselves to an ideal situation. In order to do so, critical thinking is required. Critical and creative thinking can be stimulated simultaneously through activities that integrate reason, logic, imagination and innovation, and can mainly be transmitted through conceptual knowledge which is forged and properly sequenced through the application of the higher levels of Bloom's Taxonomy (Nussbaum, 2006). A reflective, inquiry-based approach, which enables students to investigate a phenomenon, is more favoured around the world due to the fact that this makes it possible for the development of new ideas to be based upon preceding ones (Harlen, 2010). The researcher believes that for students to be able to do this, theory needs to be acquired first before being applied in practice. When students provide evidence and make comparisons to explain the object of their study, their understanding and higher-order cognitive abilities are elevated (Harlen, 2010). For students to learn deeply and extensively, it requires the

instructor to expose them to conceptual knowledge with which they engage through questioning and critical analysis, and later apply that knowledge to a practical situation.

2.5.5 The link between curriculum and social justice

It is postulated that not all needs are equally catered for or given the attention they deserve in the curriculum (Balarin, 2008). Some needs appear to be more important than others, such that the focus gravitates more towards them. The utilitarian value of knowledge seems to take precedence over the value of humanity, and productivity is determined by the skills people possess. In South Africa for example, some of challenges are inequality, poverty and unemployment. It appears as though complex challenges surrounding man need transformational change in political and social policies (Joshee & Sinfield, 2009). The assertion that the academic hut is on fire seems to be true because current dominant pockets of knowledge are unable to translate into remarkable social changes towards improving conditions of the poor (McLaren, 2005). However, in fulfilling the needs of the country, it is argued that curriculum must reach out to social justice issues by using assessment effectively to yield quality knowledge and skills as well as promoting understanding and the ability to link knowledge with skills (Zeichner & Flessner, 2009).

Not all the problems faced by society can be solved. However, curriculum can assist in driving equality and decreasing poverty to bring about social justice through epistemological access (Bernstein, 1970). Using curriculum to stimulate intellectual engagement can benefit democratic citizenship and the exercise of social justice. The dimensions which HE has a mandate to address, especially the issue of social justice in the social space, need to be presented in the curriculum and in assessment (Badat, 2010). As asserted by Wheelahan (2010), curriculum which relates to real social issues can promote morality and can develop principles of empathy, engagement in civil matters and responsible citizenship among graduates. HE therefore needs to embrace an array of issues, and not to impose conditions which reduce curriculum to the promotion of economic growth.

Notably, teaching for social justice enlightens society about some of the oppressive and competitive trends between countries that erode values of social cohesion (McLaren, 2005). At the same time, the curriculum has the potential to oppress or liberate society

because it is seen as a multifaceted system surrounded by different dimensions that include epistemological, socio-political, economic, and numerous other aspects (Kelly & Brandes, 2008). The contention is that the Higher Education Act 101 of 1997 (Republic of South Africa, 1997) made provision for the creation of a single, coordinated education system which aims at redressing past discrimination. However, it fell short in terms of balancing the different roles played by different knowledge types in the curriculum in maintaining academic quality (Badat, 2010). Notably, the role of HE is to disseminate knowledge and induct students into knowledge, skills, and competencies to become economically useful, socially engaged and responsible citizens (Badat, 2009).

Zipin, Fataar and Brennan (2015) thus assert that social justice cannot be achieved in education if content knowledge is marginalised in the curriculum. Henceforth, a much richer and multi-faceted curriculum and assessment model needs to be promoted in the classroom through designs and activities that also reflect on real issues (Badat, 2009). Basically, the principle of justice denotes the removal of impediments to parity, participation and equality in social dealings, and this starts in the classroom where students are exposed to group dynamics and use concepts to give meaning to people's day to day living (Fraser, 2009). The promotion of critical, rigorous, and scholarly work on matters of extensive research on human issues and social challenges is therefore advocated, to commit students to democratic citizenship in a classroom situation (Badat, 2009).

Curriculum and assessment are critical in pursuing academic freedom, for students to be able to respond to issues of equality and promotion of the rights, dignity and diversity of people (Badat, 2009). This implies that curriculum needs to reflect on both the economic and the political dimensions. Of importance however are human issues, as embraced in the Bill of Rights (McLaren, 2005). Although the social situatedness of knowledge is recognised, the argument is that knowledge which students acquire must give them good grounding and the ability to engage constructively with issues that threaten their livelihood (Bozalek & Leibowitz, 2012). Education and democracy are closely related and where democracy is practised, social justice exists (Nussbaum, 2006). In other words, higher education (HE) has a commitment to use curriculum to respond to all the needs of the nation, particularly the social dimension, by recognising

other types of knowledge instead of focusing mainly on skills (CHE, 2013; Badat, 2009).

Free participation by people, and their ability to think and critique knowledge, is critical, to enable them to transcend their everyday experiences in pursuit of social justice as a form of power (Young, 2008). It is thus necessary to point out that deeper knowledge informed by concepts is desirable to elevate the quality of education, which will have an indirect impact on sustainable economic growth (Badat, 2009). Deeper learning, in terms of which the integration of knowledge and skills is encouraged (Pellegrino & Hilton, 2012), is crucial to development in the 21st century. It is important that curriculum equip citizens with knowledge, which will enable them to reason and reflect on issues surrounding their environment, so that they are able to influence their environment and critically engage with issues that threaten their existence (Wheelahan, 2010). Thus, curriculum and assessment are expected to transcend beyond the mere acquisition of skills (Cakata, 2005), but to acquire knowledge that promotes intellectual abilities to enable them to design and apply skills at the workplace and for the benefit of the society. Education that mainly favours the market economy is unable to generate policies that align with local issues and at the same time address the social transformation of individual countries; such education is questionable and does not benefit countries that require major development on social issues (Joshee & Sinfield, 2009; Zeichner & Flessner 2009).

The teaching and learning processes applied in the classroom situation can be used effectively to encourage participation and engagement through critical reflection in societal debates and other issues around the socio-economic, political and environmental conditions of communities (Balarin, 2008). Such classroom activities touch upon the idea of social justice and allow students to implement democratic principles and human rights as building blocks towards achieving social changes. As postulated by Balarin (2008), such a change is ideal for the development of a better society where the rights of people are recognised and respected. Moreover, debates on social issues not only lead to empathy and understanding with regard to the plight of others, but also assist students to present logical arguments and deepen their understanding in addressing issues in their social environments. Such debates also contribute towards making responsible citizens of the students.

Clearly, the realignment of the curriculum design with the transformation agenda outlined in policy documents needs to be questioned (DoE, 2013). The development of reasoning resonates with viewing reality through an objective lens and basing arguments on facts, which has a greater impact on addressing certain behaviours in society (Young & Muller, 2013). At the same time, this is made possible through intrapersonal skills, language mastery learned from communities, engagement and consideration of local and global citizenship (Binkley, Erstad, Herman, Raizen, Ripley & Rumble, 2010). Deeper learning encompasses the ability to transfer what one has learned, and the ability to apply it to new situations. It further involves one's interaction with others, especially the community, by sharing and applying knowledge to solve problems. This then requires the creation of a link between theory and skills in programme offerings.

What is critical is not the development of knowledge at a recall level, but knowledge that can be transferred to new situations combined with the capacity to solve complex problems (Pratt et al., 2014). The researcher is of the view that unless students are prepared with tools and given a space expressly to deal with the challenges associated with discrimination and inequities, education will lose its focus and impact. The researcher's view is that curriculum and assessment can embrace social justice issues by seeking to defend the identity of groups that are culturally, politically and economically dominated by other forces. In this instance, the classroom situation can be used to question the dominance and oppressive nature of ideologies that the state perpetuates in education, especially the dominance of the economic dimension and the neglect of other dimensions.

Challenges such as unemployment, crime, a stagnant economy, women and child abuse, and the scourge of HIV/Aids, as well as positives such as the principles of Ubuntu, are some of the issues that need to be debated in the classroom situation so that students' behaviour, their roles and the lens through which they view things can change. Unquestionably, it remains the responsibility and duty of everyone to apply their knowledge and skills in contributing towards social change; and this also includes academics and the business sector (McLaren, 2005). This implies that more still needs to be done to impart critical skills and knowledge that impact on changes in behaviour with regard to social issues that have become challenges, both locally and globally. Similarly, the researcher is of the view that the process of reflective strategies in the

form of debates, critiques, peer reviews, engagement and reflective reports may accommodate the diversity and differentiation of different knowledge structures.

As stated by McLaren (2005), the concept of social justice means more than just respect for human dignity, equality and equal opportunities. For example, community development as another leg of a university mission, attempts to bring universities closer to the people to contribute towards improving lives. This is evident in many programmes in which UoTs forge partnerships with communities to share knowledge as another way of contributing to the social justice agenda. For South African learners in an emerging democracy to overcome social issues and inequities, it is further reiterated that epistemological access, which serves as an embodiment of broader principles that enable individuals to live meaningfully, is necessary (Wheelahan, 2010). In this way, education instils and builds human capabilities that allow students to move beyond their lack and deprivation, so that the entire society can enjoy rights and freedoms, and progress at the same time (Nussbaum, 2011).

2.6 THE ROLE OF ASSESSMENT

As curriculum embraces principles, content and modes of learning that embrace national priorities and align to international trends cannot be realised if they are not driven by assessment. As a result, assessment becomes a key player through which learning and student development unfold (Carless, 2015), which implies developing enquiring minds, and measuring students' competencies so that students can acquire skills and knowledge and other attributes that are critical for their success in becoming good citizens. However, the manner in which they are used can hamper student success in learning. The use of assessment in limiting the development of thinking abilities can be traced as far back as Medieval times, when modes of assessment that were used promoted passive learning and were characterised by teaching students to learn and memorise texts by heart, while examinations took the form of question and answer format, with students reciting answers (Yates, 1966).

The purpose of assessment is to provide guidance and give feedback as to whether students understand what they are learning (Boud & Molloy, 2013). With past traditional teaching and learning activities, assessment was not was about recall of facts (Yates, 1966). This implies that learning was not treated as a meaningful way of

developing students' development. Also, feedback was not considered in assisting students to improve. However, since new forms of assessment have been introduced, feedback has been seen to be playing a critical role in promoting students' development by pointing out aspects that students had not mastered and giving them the opportunity to correct the mistakes (Boud & Molloy, 2013). To Carless (2015), feedback is about remedial support given to students in order understand content better, which translates to opening up a dialogue in the pedagogical space in the sense of pointing out areas that need to be improved and the student taking the responsibility in improving on areas that were not initially understood.

Assessment includes strategies that are used to gather information about students' abilities to learn skills and knowledge, and about how they mould their attitude or thinking, and it consists of two components: formative assessment which is ongoing, and summative assessment which sums up performance at the end of the year (Knight, 2006). Assessment is one the critical elements which contributes to the promotion of meaningful teaching and learning while also enhancing the link between theory and practice (Conley, 2011). However, the focus on throughput or student pass rates, as opposed to assessments that transform students' thinking, seems to be the norm in HE (Vanderheide & Walkington, 2008). Furthermore, Boud (2000) asserts that current assessment practices are not doing enough to sustain the knowledge which students might need in their future endeavours.

Biggs' (2012) alignment strategy added value in bringing a connectivity between learning outcomes, formative teaching and learning activities, as well as modes of assessment employed, including summative assessment. The researcher is of the view that the development of intellectual abilities rest upon the level of engagement opportunities that are presented through curriculum and assessment. As a result, outcomes may hinder unplanned productive activities that promote engagement from taking place (Havnes & Prøitz, 2016). Furthermore, a learner-centred approach is presumed to be formative and geared towards facilitating active involvement of students accompanied by feedback to improve learning. At the same time, formative assessment allows students the opportunity to collaborate with peers, to become innovative and to think creatively – unlike summative assessment (Bjaelde & Najbjerg, 2017). Research and reviews that have been conducted in school settings and in HE contexts relating to formative assessment have shown it to be an effective strategy in promoting student

learning in various educational contexts (Black & Wiliam, 1998). Additionally, as mentioned by Black and Wiliam (1998), the quality of feedback accompanying assessment contributes towards students' sustainable development, because formative assessment is recognised as assessment for learning.

The researcher's contention is that the value of assessment cannot be measured in terms of learning outcomes only, but as postulated by Bryan and Clegg (2006), they need to be made more holistic to embrace quality. According to Boud and Falchikov (2007), assessment caters not only for students' immediate needs, but has to cater for their future needs as well. Assessment is synonymous with developing quality learning in higher education and directs attention to what students need to know; therefore, the focus in curriculum should not be placed mainly on the end result because the learning process is equally important (Knight, 2002; Dochy, Segers, Gijbels & Struyven, 2007). This implies that policy makers need to look at how pedagogy and assessment practices can be used to protect conceptual knowledge from declining. This has a direct implication on making a shift in assessment, to move away from the focus on testing and standards, and to move towards the continuous and meaningful development of students. Moreover, the assessment process must contribute towards clarifying learning objectives and the criteria must be used to convey meaning and insight (Conley, 2011).

The kind of knowledge and skills students are expected to acquire is critical in assessment. Good assessment may follow the guidelines of Bloom's Taxonomy, to determine the level and depth of what is being assessed. For example, lower level skills or knowledge cannot be assessed in the same way as higher-level knowledge or skills (Darling-Hammond, Adamson & Abedi, 2010). As explained by Darling-Hammond et al. (2010), the higher the levels of the pyramid, the more complex and deeper the level of understanding is required. At higher levels of the taxonomy students are expected to apply, analyse, argue and solve particular problems. This implies that HE is expected to use more of the higher levels of the taxonomy to prepare students for the complex world in line with what is being taught which, according to the researcher, points towards the teaching of deeper knowledge to match the challenges found in the real world.

The need for graduates who can make a difference in others' lives and who can advocate better standards of living amongst communities is clear. This also requires curriculum and assessment strategies that harness science to develop students' insight so that they

are able to engage with the world critically (Shay, 2008). Unquestionably, research has shown that assessment works best when it promotes learning; for example, the Assessment Reform Group (ARG) in the UK has over the years focused on using assessment activities to support learning (McSweeney, 2010). Such an approach invests more in learning than in concentrating on marks. Shay (2008) also suggests a knowledge-driven curriculum and assessment which allows the application of knowledge to real problems through the use of assessment techniques that develop students' ways of thinking, communicating, arguing and managing conflicts. Furthermore, Joughin's (2009) assertion is worth noting: that assessment has three roles, which include supporting students' ways of learning, the focus on students' achievements in line with the requirements of the course, and the preparation of students for a profession and the maintenance of professional standards.

Assessment is expected to embed a cognitive role through which students should learn to interrogate or judge and provide reasons why certain things happen or why certain claims should be accepted or refuted (Joughin, 2009). To instil a sense of inquiry amongst students, Conley (2011) indicates that assessment should also be used for meaningful learning. Assessment has the power to influence the teaching and learning process, yet its current limitation is that it is unable to penetrate other knowledge forms, which creates a number of doubts about the power of its role (Knight, 2000). Conceptual knowledge does not find expression in the dominant focus on demonstrable skills, while theoretical knowledge is critical to the accomplishment of pedagogical goals. However, theoretical knowledge is not assessed effectively (Shay, 2008). The argument raised is that the main challenge regarding assessment involves the problem of knowledge, and that assessment cannot only assess knowing Maton and Muller (2007) but also needs to assess knowledge of principles underlying disciplines that contribute in the development of thinking abilities. This argument lends itself to the description of, and the differences between, disciplinary and contextual forms of knowledge when designing assessment, because current assessment methods obscure the positioning of disciplinary knowledge at the centre of assessment (Shay, 2008).

Bernstein's knowledge forms, on the other hand, reflect on the evaluative or assessment rules of the vertical and horizontal forms of knowledge which are distinct and need to be assessed differently (Bernstein, 2000). This implies that assessment plays a significant role in different knowledge forms and it is required to be used effectively.

The implication is that assessments need to be packaged in a manner that allows learners to experiment with open-ended, reflexive, epistemological questions about how we can respond to the situation, why A relates to B, why situation C might influence situation D, and so forth (Lotz-Sisitka, 2009). The assertion is that tasks given to students should not only include tasks that only promote understanding but that they should include analytical and critical application questions that promote authentic learning (Carless, 2015; Sambell et al., 2013).

Assessment which enables students to develop their thinking abilities and that can be applied to contextual scenarios is seen as critical (Maton & Muller, 2007). Firstly, it recognises knowledge as objective and different from knowers and knowing (Maton & Muller, 2007). In other words, it consists of both the social and epistemic aspects. Secondly, it constitutes theory and practice which are distinguished from one another and are assessed differently. The former assesses mostly higher-order skills, whereas the latter tends to assess predominantly lower-order skills. Assessment makes it possible for the forms of knowledge in a curriculum to be realised. With this claim, the researcher is referring to conceptual knowledge, which normally precedes procedural knowledge. For example, a student who is solving an algebra equation may only do so if he or she has already mastered the preceding concepts. This implies that assessment methods should cover both concepts and skills to represent different knowledge types. A combination of different knowledge types in the assessment process helps to address students' thinking abilities instead of merely emphasising the assimilation of content with no direct relevance to their world of experience.

According to Darling-Hammond et al. (2010) most of the high performing countries like Australia, Canada, England, Finland, Hong Kong and Singapore, use more of the high levels of Bloom's Taxonomy in formative assessment tasks, which range from open-ended essays to research papers or students' presentations that aim at developing inquiry skills amongst students. The most important matter is not just to score students on a test, but rather to assess knowledge and skills that students have acquired. Furthermore, the assertion presented by Darling-Hammond et al. (2010) is that in the above-mentioned high performing countries, particularly in Singapore, England and Australia, about 20% of their science examination papers incorporate assessment questions that are based on experiments and inquiry and teachers are trained to evaluate such criteria.

In the process of assessing student activities, rubrics are beneficial for detailing the standards to assess what the student has learned, for describing the expectations and also for outlining the criteria for marking (Boud & Dochy, 2010). However, the researcher's view is that a rubric designed to evaluate higher order thinking, particularly on socio-economic and political issues, might be complex and may lack validity, especially when the teacher does not have enough information on those aspects. Although there are challenges in how assessment is done, it is acknowledged that some significant strides have been achieved by constructivists in describing assessment. What stands out most, in the view of the researcher, is the constructivists' creation of formative and summative assessment, which has the added advantage of taking learners through small sections of different themes before the larger sections can be assessed during summative assessment. Constructivists are thus acknowledged for their social constructivist perspective for deepening our understanding of assessment (Shay, 2008).

2.6.1 Changes in assessment

The outcomes-based approach to assessment has, on the other hand, turned its focus mainly towards standards prescribed by policy, which raises a number of questions regarding the neglect of epistemological knowledge, and how assessment strategies are being used to emphasise one form of knowledge at the expense of the other. The outcomes-based assessment policies, which follow an instructional discourse embedded in instrumentalist principles, limit the curriculum from extending into deeper levels of knowledge and assessment and have been devalued into an instrument to assess behavioural performance, allowing little in the way of holistic and in-depth development of students (CHE, 2013). The result is that higher-order cognitive levels enabling students to go beyond the known to the unknown tend to be underdeveloped. A typical example is of students in the United States who were introduced to learner centred approaches in the 1980s and exposed to more opportunities than other generations: these students were found to doing badly in literacy, numeracy, and problem solving in technology-rich environments compared to international peers (Goodman, Sands & Coley, 2015). The expectation is that assessment must be used effectively, especially in HE, to assess thinking skills and complex performances, and

to enhance critical thinking, which is a feature of theoretical or abstract knowledge (Knight, 2002).

Similarly, uncertainty about the powerful role of assessment in the curriculum invites a critical review of assessment practices as espoused by social constructivist theorists, who laid emphasis on the situatedness of practice at the expense of knowledge, which seems to be the very object of assessment. It is the conviction of the researcher that assessment is the nucleus that conveys knowledge regardless of which form is emphasised, and that function is best fulfilled when knowledge is assessed. With the massification of education, physical access was given more consideration than epistemological access, which caused assessment to have little impact on the development of higher-order cognitive skills (CHE, 2013). Furthermore, there are a number of claims that the role of assessment, as far as quality assurance and the enhancement of the teaching and learning process are concerned, is no longer convincing (Shay, 2008).

Concerns have been raised with regard to the fact that over the past decades, assessment was known for its significant role in improving the teaching and learning process (Malik, 2009). However, recent reports on assessment express a number of doubts about its role and potential. Admittedly, assessment shows some gaps as far as the assessment of other knowledge types is concerned. In the view of the researcher, the reason for this crisis is that other types of knowledge are not adequately assessed due to the priority given to what learners can demonstrate, over what they should know in alignment with the national economic agenda. It therefore becomes necessary for assessment to cover both abstract knowledge and procedural knowledge in the curriculum. The undergirding of curriculum with conceptual knowledge contributes towards implementing a kind of assessment which reinvigorates critical inquiry, improves students' higher-order cognitive abilities, and the level of teaching and learning, respectively (CHE, 2013). However, the overarching goals still gravitate more towards the development of skills and less towards higher-order cognitive levels, especially with students at the lowest levels of the subject hierarchy.

Furthermore, the kind of assessment supported by constructivists differs from those that follow the critical paradigm. Constructivists, for example, focus on the ability of students to construct new knowledge and create meaning out of knowledge, whereas

the critical paradigm focuses on their ability to reflect critically on knowledge (Singh, 2011). This type of scenario clearly indicates a gap in assessment in that it focuses on certain aspects while neglecting others. The researcher believes that assessment should assess both higher- and lower-order thinking and should allow students to make meaning from their experiences while reflecting on abstract ideas that go beyond culture and experience.

2.6.2 Gaps in assessment

A disjuncture between modes of assessment that do not develop student thinking abilities raises some concern. Learning that maximises the development of thinking abilities is obscured due to assessment strategies that are used (Carless, 2014), as they assess more applied knowledge than conceptual knowledge. The bone of contention is that the concentration on assessment methods favours performance and leaves the learner without deeper knowledge. Conley and Darling-Hammond (2013) highlight the crisis about the gap in assessment in their assertion that assessment in higher education is still a grey area with regard to promoting meaningful learning. Meaningful learning is seen to be accompanied by effective formative assessment which allows students' voices to be heard and gives them activities that engages them to think deeply, use and retain the knowledge and skills for use in other contexts (Jacoby, Heugh, Bax & Branford-White, 2014; McCoy, 2013). Clearly, the early exit of students at diploma level, facilitated by summative assessment, especially in the humanities, creates a gap in the generation of new knowledge. To that end, the idea put forward is to support the assessment of thinking skills (Alexander, 2008).

Although assessment is seen as a foundation for activities that play a vital role in the process of innovation, the view held by Knight (2002) is that there is a crisis in HE assessment practices, specifically in the role of assessment in enhancing the quality of teaching and learning. One of the challenges around modes of assessment is that assessment does not translate into contributing to students' learning (Carless, 2015). The mentioned authors emphasise that assessment needs to be used effectively to assess all knowledge forms. Given that, policy influences assessment regarding what is to be prioritised in the curriculum in line with national targets and economic needs, and therefore influences what is to be assessed (Broadfoot & Black, 2004; Singh, 2011).

Assessment is expected to focus not only on what can be demonstrated but also on stretching students' thinking capabilities through critically demanding inferences, reflections and debates in areas other than the workplace (Shay, 2013).

The crisis in HE with regard to assessment has been reiterated by the Minister of Education in Singapore, Tharman Shanmugaratnam, who asserts that students do not need repetitive tests that are characteristic of a one-size-fits-all type of instruction. Rather, they need engaged learning that facilitates discovery, builds character and entrenches good values amongst students (Darling-Hammond et al., 2010). Therefore, HE needs to cultivate the capacity for logical reasoning, which transcends to the cultivation of humanity through assessment. In addition, Badat (2009) emphasises that assessment facilitates the pursuit of social and human rights when students assess and reason through challenges that hinder progress and full democratic engagement in real-life contexts by making comparisons and providing good solutions. The researcher believes that allowing students to reflect on and debate issues and critique texts in a classroom situation is another useful way of making assessment real.

2.6.3 Assessment and the deepening of knowledge

While students are being prepared for the labour market, they do not live in a vacuum. They are surrounded by a myriad of problems in their immediate environments, which requires them to analyse these contexts through appropriate assessment strategies. Assessment is thus an important tool in the teaching and learning process and determines whether students are meeting the expected aims (Conley & Darling-Hammond, 2013). The most critical issue is to determine where the main focus lies: are we are assessing knowledge, understanding or skills (Kotze, 2002)? To match higher-order thinking, Kotze (2002) suggests that assessment methods should represent various thinking processes and should include all the variables identified in Bloom's Taxonomy. As posited by Carless (2015), assessment is supposed to promote learning that enables students to think better and to be able to apply what they have learned in future contexts (Carless, 2015), which implies giving them feedback as well as more opportunities to master the content, and also giving them activities that they can connect the knowledge and skills they have learned to real situations in their contexts. According to Sambell et

al. (2013), linking activities of students with real life scenarios increases the development of their thinking abilities.

The researcher maintains that learning activities which include a variety of skills ranging from higher- to lower-order cognitive levels culminate in a complex performance and can be pursued through several different activities, such as a persuasive letter, a report about an environmental issue, a group project, a research paper, drama or poetry involving critical self-reflection. When such activities are prepared and administered as assessment tasks, they should move along a continuum of higher- to lower-order cognitive domains by using Bloom's Taxonomy of cognitive domains. Assessment that focuses more on skills than on high-level intellectual abilities kills intellectual robustness and places research inquiry at a disadvantage. Moreover, the most important role of a valid, reliable and fair assessment is that it has the potential to influence curriculum and pedagogy (Darling-Hammond et al., 2010).

It follows that the challenge in the assessment discourse lies in the transfer of tacit knowledge, especially in HE, which is influenced by the instrumental approach since the form of assessment in use has pushed away knowledge from the centre of the curriculum in favour of procedural or practical knowledge, as a response to union demands with regard to the workplace (Shay, 2008). To this effect, the focus on the acquisition of concepts and content is significant and students should be exposed to open-ended, reflexive, epistemological questions (Morrow, 2009). Morrow further suggests that assessment needs to be grounded in critical inquiry which illuminates theoretical knowledge as well as promoting deep learning (Darling-Hammond & Noguera, 2014). The researcher is also of the opinion that classical principles that have worked over the centuries should not be discarded for the sake of succumbing to the demands of industry and labour but should be integrated to achieve the goal of education, which is to develop students holistically.

Although learning is propositional in nature, the current assessment practice, which emphasises unit standards and outcomes, downplays conceptual knowledge and kills originality, excellence and the mastery of disciplines. The concern raised pertains to the downsizing of concepts in the curriculum, and Pellegrino and Hickey (2006) argue that the way in which curriculum goals, teaching and assessment processes are shaped has little to do with knowledge. According to Pellegrino and Hickey (2006), standards are

linked to the description of knowledge and a level of understanding which underpin teaching and assessment, and which are missing in today's curriculum. The implication is that knowledge acquisition needs to transcend the acquisition of basic skills to a level of creativity, innovation and problem solving. Nevertheless, the way in which assessment is dealt with places an unjust limitation on the curriculum, which leads to failure to tap into the deeper learning and insight because the kind of assessment used also does not delve deeper into the theoretical base of the content (Pellegrino & Hickey, 2006).

Given the fact that knowledge precedes and informs assessment, it is important to note that it is not sensible to divorce curriculum from assessment discourses. Furthermore, it is impossible to consider assessment without first looking into knowledge embedded in disciplines. Emphasis is placed on deepening knowledge through assessment by evaluating knowledge that is located in what Bernstein (1999) refers to as the vertical, hierarchical form, and in following this process, educators lay the foundation for students to be able to analyse texts and explore new knowledge that can be applied in different situations (Shay, 2008). Assessment must portray an objective view of reality as presented by the natural world, which follows a scientific approach to knowledge acquisition (Broadfoot & Black, 2004). It must be used to direct learning towards meaningful growth and future developments instead of merely what is known and should not be divorced from the learning process (Pellegrino & Hickey, 2006). Support is given to knowledge acquisition which is drawn from concepts and which is illuminated through the assessment processes used (Maton, 2009).

A good assessment design which distributes learning activities such as written assignments, verbal presentations or tests throughout the course, increases the opportunity for internalising knowledge and promotes the long-term retention of learning (Carless, 2007). Notably, the expectation is to develop critical, reflective learners who are expected to reflect on socio-economic and political inequities. However, assessment is deficient in successfully developing the type of learner who will successfully be able to solve complex, unfamiliar problems that are not contextually bound. To curb this challenge, it is suggested that assessment should consider the object of assessment and the way in which it is assessed, by impacting on aspects such as ontology and epistemology (Shay, 2008). Shay further suggests that assessment must provide clarity on whether to assess knowledge, knowing or knowers. To bring about

balance, outcomes are expected to be improved in order to embrace objectives that will be drawn from knowledge.

By the same token, Moore (2007) adds that assessment should be founded on realists' understanding of knowledge because such an approach recognises the intrinsic sociality thereof and its objective independence from the knower. Bernstein (cited in Moore, 2007) however also supports a theoretical framework for rethinking the link between knowledge and evaluative assessment methods grounded in the epistemic roots of knowledge. The challenge in assessment discourses is that of transferring tacit knowledge because of the current curriculum (O'Donovan, Price & Rust, 2004). The effect is that other types of knowledge, particularly disciplinary knowledge, do not get the attention they deserve, which translates into the limitation or failure of assessment to elicit abstract knowledge which will develop critical thinkers and reflective practitioners.

2.6.4 Assessment stimulating higher-order cognitive levels

Notably, the point of departure for knowledge synthesis and application resides in the conceptual grounding which will develop and stimulate higher-order cognitive capacities. In this regard, Shay (2008) concurs with the notion that HE needs to assess complex aspects of learning processes that are rooted in disciplines and underpinned by theoretical knowledge. Also important is the fact that assessment should promote an element of inquiry and intellectual engagement with reality, which is only possible if conceptual knowledge becomes the base of the knowledge to be assessed (Moore, 2007). Equally important is the fact that disciplines draw on different forms of knowledge. The differences in weighting and the display of knowledge need to be evident in the assessment processes so that students may be able to move from the known to the unknown, which leads to systematic learning and epistemological access (Muller, 2008).

Maton and Muller (2007) support the notion that assessment is useful if it displays the objectivity of knowledge and differentiates between knowledge, knowers and knowing. This claim is supported by Bernstein (1999), who distinguishes between the two levels of knowledge and emphasises that the two should be assessed differently. The kind of assessment advocated by Bernstein (1999) differentiates between the two forms of

knowledge and emphasises assessment which promotes critical inquiry and innovation. The arguments presented emphasise the idea that the type of assessment that illuminates both procedural and theoretical knowledge should be considered. Case studies, reflective practice essays or analysis of articles may be used to improve the standard of assessment and allow higher-order cognitive levels to be stimulated.

Credible assessment criteria have the potential to encompass and speak to problems with which students are faced in their real world. The use of case studies that relate to students' experiences are also helpful in terms of building a theoretical base and developing critical and analytical skills. With the improvement of assessment, the ability to develop students to reflect and apply the meaning behind theoretical concepts in relation to the known will be enhanced. Indeed, small projects, group work, and debates during formative assessment might prove to be effective in illuminating knowledge and developing logic and inquiry, while also promoting creativity in the process of assessment. Additionally, a challenge lies in the development of a broad, complex rubric. However, education is mandated not only to develop individuals who will not be indifferent or have a narrow view of reality, but also to develop morally astute and responsible citizens.

2.6.5 Critical reflection as another form of assessment

Critical reflection is grounded in the conviction that learning is maximised when it is active, engaged, and collaborative, all of which are essential to in-depth learning (Ash & Clayton, 2009). It is characterised by a form of reflection which generates learning through research, and systematic learning where one asks questions and confronts bias by weighing options and making judgements before reaching conclusions, including contrasting theory with practice. Reflection can mean different things to different people. For some, it may mean reflecting on their ideologies, whereas for others, it may also refer to the link between theory and practice. It can also be a form of in-depth student learning in which students are immersed in the reality and experience of what they see, as well as the reality of others affected by social ills. Critical reflection is an extension of critical thinking which deepens learning and is seen as an instrument which improves the level of thinking, enhancing analytical skills by engaging with content knowledge (Smith, 2011; Harvey, Coulson, Mackaway & Winchester-Seeto, 2010).

Critical reflection encourages students to make connections by analysing and applying logic as they engage with their environments and those surrounding them. In making connections and critiquing their worlds, students are better developed to have a broader understanding of different worlds and their world of work (Higgins, 2011). The use of critical reflection increases the chances of making learning relevant, and includes strategies that may also include case studies, reflective journals, reports and oral presentations (Eames & Cates, 2011). Such strategies allow students the opportunity to reflect critically on their social contexts and to contribute towards improving their social environments and systematic inequities found in various institutions to create a positive impact on people (Archer, 2000).

Although concepts such as reflection, critical reflection, critical thinking and reflective practice are, to some extent, not necessarily the same, they are mostly used interchangeably (Fook, 2010). The critical reflection process is participatory: it deepens learning, and conclusions are reached in an objective manner. The nature of the process of learning lends itself to transformative learning and behavioural change on the part of students, and both of these have an impact on transformative understanding and the kind of learning that results in improved thinking, learning and the ability to evaluate the self and other social processes (Smith, 2011). Critical reflection is further encouraged for the development of metacognition amongst students (Eames & Cates, 2011). It is pertinent to developing students not to accept information or situations at face value but to dig deeper and to examine causes or influences from a holistic perspective (Thompson & Thompson, 2008). However, the researcher is of the view that critical reflection into one's environment may be made possible only if theoretical knowledge based on principles guides and informs practice in the curriculum.

The practice of self-reflection and, to some extent, critical reflection is seen as a useful instrument that can be used to drive social justice in the classroom context and beyond. It is a way in which students reflect on their experiences based on their day-to-day situations and in which they integrate these with what they have acquired in formal settings where teaching and learning are taking place (Brookfield, 2009). Most importantly, reflection is seen as one of the critical foundations of transformative learning and is associated with a behavioural change or paradigm shift. It further brings to light oppressive forces that may creep into the classroom situation, which need to be

given a platform in the teaching and learning process as a way of enforcing democratic values that are aligned with the Constitution (Eames & Cates, 2011).

Critical reflection can encourage engagement and assist in closing the gap between passive and active participation because students engage in intellectual and affective activities that help them to gain a better understanding of other experiences (Boud, Keogh & Walker, 1985). Reflecting by linking experience to content-laden knowledge, particularly in a spoken form, not only gives students a voice but boosts their confidence as well. In addition, it forces them to do research and to participate actively by sharing their experiences. Through reflective journals and inquiry, logic, comparisons, selections, critiques, and interpretations are adopted. Various forms of assessment embedded in critical reflection can be used in all disciplines to improve learning, and to transform practice, beliefs, attitudes and the ways in which things are done on the part of teachers and learners (Boud et al., 1985).

Furthermore, critical reflection is seen to have the potential of improving learning because it paves the way for the exchange of ideas and knowledge about new things and new ways of doing things on the job (Borich, 2007). Reflecting on practice may assist in mitigating the great divide between theory and professional practice (Mason, 2014). The modern world requires critical thinkers, communicators and problem solvers who can benefit from engagement in rigorous and reflective dialogue in class discussions and various other activities in the teaching and learning process. From the above assertions it may be deduced that critical reflection manifesting in various forms of knowledge and skills assessment may be used in improving the quality of learning as well as developing students cognitively and holistically.

Notably, when students are given an opportunity to reflect critically on social injustices, issues and problem-solving processes, they are challenged to eliminate errors when solving problems. Moreover, forms of assessment that are linked to students' reflective practices may contribute towards transforming learning (Ash & Clayton, 2009). At the same time, reflection can be integrated with learner-centred methods which involve a cooperative pedagogical form as an integrated way of learning (Hillier, 2009). Similarly, reflective practices have the potential to increase students' sense of identity and to boost their confidence. Their active participation in classroom activities provides an indication of the roles they will play in their communities. Moreover, students

recognise that independence of thought is valued, and is a significant step towards fulfilling their expected roles in communities where they will be required to use their voices as powerful weapons to question oppressive inclinations (Eames & Cates, 2011).

2.6.6 Assessment for learning

The discourse of dissatisfaction with assessment and its effectiveness has resulted in advocating assessment for learning. According to Carless (2015), assessment for learning is seen as adding value to students' meaningful learning. The claim about its value lies in the fact that it places emphasis on its purpose to enhance deeper learning in the sense that students are able to make sense of their learning through the kind of feedback which is readily provided (William, 2011). Outlining the purpose of learning encourages students to know about important elements in the specific units of the syllabus, and also the weights assigned to each learning task. Such transparency in explaining how students will be assessed also promotes dialogue and mutual trust between students and teachers. Assessment as a tool used to enhance learning should contribute towards productive learning by placing feedback at the centre of assessment so that immediate remedial action can be taken (Sambell, McDowell & Montgomery, 2013).

Sambell et al. (2013), on the other hand, suggest that effective planning should accompany the kind of instruments that are used, for example rubrics, according to which students are given enough explanation about the purpose of the instruments, such as the rubrics being used and the results they yield, after assessment has been done. This adds weight to the use of rubrics, giving quality feedback and guidance to students in judging their work (Sambell et al., 2013). The implication with regard to immediate feedback and remedial action taken to support learners resonates with formative assessment, as it is impossible to give feedback on summative assessment which is done at the end of the term.

2.7 CHAPTER SUMMARY

This chapter has reviewed literature on changes with regard to curriculum and assessment due to the influence of global trends and the focus on the market economy.

The chapter highlighted a gap and an imbalance in curriculum design and assessment in HE, both of which have resulted from a greater focus on skills than on theoretical knowledge. The role of universities of technology in advancing the path taken by the market-driven economy to produce skills was also discussed, and the introduction of graduate attributes as a way of complementing the skills-oriented approach was addressed. Assessment as a process which includes the element of inquiry through the integration of higher-order cognitive domains and critical reflection in the curriculum was explored, including the aspect of social justice. What has further been highlighted is the idea of a balanced approach to curriculum, where theory and practice are incorporated to produce graduates who will be conscious of social issues and challenges surrounding their communities, to enable them to liberate society.

The next chapter will describe and explain different theoretical perspectives as well as the theoretical framework selected for this study.

CHAPTER 3 : THEORETICAL FRAMEWORK OF THE STUDY

3.1 INTRODUCTION

Chapter 2 focused on a review of the literature pertinent to this study. In the current chapter the social realist perspective will be discussed and analysed as a theoretical framework guiding the study. However, a brief preview of other theories will be presented as they too shaped curriculum design. Since social constructivism and critical realism share some features with social realism, these features are briefly discussed, followed by an in-depth discussion of social realism. The chapter is organised as follows: firstly, the value of a philosophical orientation will be explained. Secondly, social constructivism is discussed, with the intention of specifically identifying some common features between this concept and social realism. Thirdly, the chapter describes social critical realism, together with some elements it shares with social realism. Lastly the chapter will consider social realism as the selected theoretical framework underpinning this study.

3.2 THE VALUE OF A PHILOSOPHICAL ORIENTATION

The process of finding the truth is examined through a philosophical lens which is referred to as a worldview or lens by means of which reality is investigated (Kuhn, 1970; Denzin & Lincoln, 2011). According to Grant and Osanloo (2014), a theoretical framework provides the basis on which knowledge is founded, and this makes a theoretical framework significant in deepening meaning to get to the crux of the inquiry. An inquiry into curriculum and assessment matters as a social phenomenon in UoTs requires a lens that applies science to social issues. Knowledge constructed from experience needs to be complemented by scientific knowledge to maintain objectivity and truth. The central issues in this research are curriculum and assessment in fields of study that focus more on skills to be demonstrated than on theoretical concepts to downplay the effect of truthfulness in the curriculum.

As a theoretical framework provides a foundational grounding for establishing knowledge, the following theories, namely constructivism and critical realism, are

discussed, together with the common features they share with social realism as the chosen framework for this study.

3.2.1 Social constructivism

The social constructivist theory incorporates behavioural principles and focuses more on social experiences in which learning takes place, relating learning to real life situations by promoting students' active involvement in the process of learning (Vygotsky, 1978). According to Vygotsky, the significance of learning is attached to cultural and social experiences. In other words, learning is a social process which is predominantly discovered by doing, and it takes place within individuals who interpret the world based on their different individual interpretations (Vygotsky, 1978). The researcher points out that this theory differs from the social realist stance, which places student development in the acquisition of skills and intellectual abilities that enable students to interpret the world in an unbiased manner. As such, curriculum design and modes of assessment that are aligned to outcomes for mere demonstration of learning, need to be improved.

Firstly, social constructivists believe that learners create their own social subjective picture which portrays the objective nature of things (Boghossian, 2006; Pinar, 2010). Secondly, social constructivists reduce knowledge to activities that students are expected to perform. For example, students will be divided into working groups and assigned a task to discover things, or to a design a visible product in relation to which they use their own experiences or understanding to interpret what is produced or presented. In the various fields under investigation, group tasks and students' participation have been used to promote learning. However, the assertion is that constructivist philosophy includes a learning theory which focuses more on how students learn and interpret the world while it lacks a teaching theory with a wider value in terms of an 'ontological' approach to knowledge (Temple, 2012). The researcher is thus of the view that the acquisition of such knowledge is not enough in terms of being conveyed to other contexts with varying cultural and historical backgrounds, and it still needs to be supported.

The above assertions are refuted on the basis that individuals construct knowing from their own subjective experiences of public knowledge, which lacks universal principles

to confirm the credibility or truthfulness of knowledge (Pinar, 2010). The validation gap in socially constructed knowledge needs theoretical content to complement it because, according to Maton (2014a), theoretical knowledge derives its principles from disciplines beyond human knowledge and, according to the researcher, such knowledge is pertinent for the development of thinking abilities. Like social realism, social constructivism supports the belief that knowledge is found in the social domain and is derived from people's cultural experiences: one cannot be divorced from the other. However, the two theories differ in their tenets relating to the role of knowledge found in the natural reality outside the social context.

Social constructivism theory is mentioned here because it was the focus of the initial transformational agenda of curriculum design and its mode of assessment highlighted the value of outcomes and their alignment with all the processes of teaching and learning as proposed by Biggs (2012). The researcher acknowledges the value of this theory, but points out that the theory focuses more on what Maton and Muller (2007) described as knowledge of the knowers. Instead of navigating this knowledge towards a hierarchical level to develop the cognitive abilities of students, it is viewed as an area of concern by social realists which hinders lasting impact on the intellectual development of students.

3.2.2 Critical realism

Worth mentioning is also the theory of critical realism which cannot be used to guide curriculum design and assessment modes that sought to pursue the development of intellectual abilities that can contribute towards solving society's problems. The theory proposes that unobservable events cause observable ones and that the social world can be understood only if we understand certain mechanisms or structures (Jasson-Vorster, 2010). The theory differs from social realism theory by categorising reality into three stratified domains. The first domain is the empirical level, where all the discoveries originate: this represents the world of social interaction in which things are observed, experienced and seen. The second level is the actual level, and includes the conditions required for events to happen: this is the result of the interplay of structures and mechanisms found on the third level. The third or the real level is the deeper of the two layers and consists of mechanisms that generate actual events (Jasson-Vorster, 2010; Archer, 2000; Bhaskar, 2008).

The figure below represents Bhaskar's domains of causal relationships (Bhaskar, 1978).

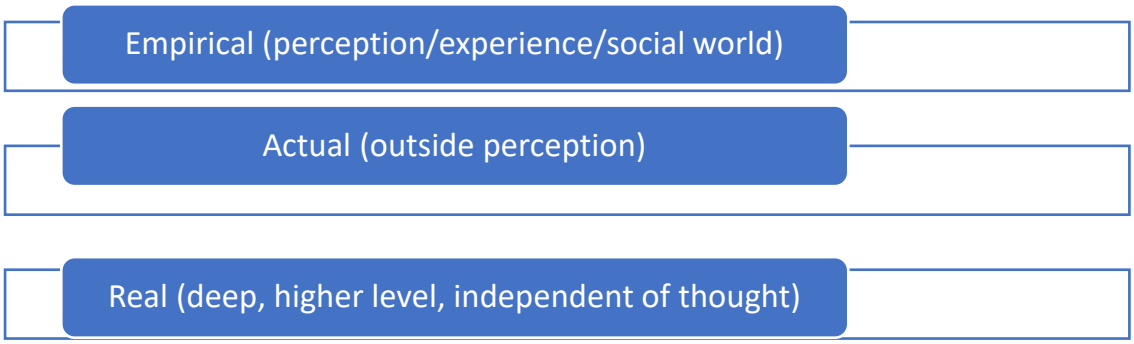

Figure 3.1: Bhaskar's domains of causal relationships (adapted from Bhaskar, 1978)

Critical realism shares a common belief with social realism about the external existence of knowledge and its independence from human thought; they differ however in their approaches (Jasson-Vorster, 2010). To critical realists, the epistemological position of truth relies on empirical observation and different people can give different answers to a single observed phenomenon (Haslanger & Haslanger, 2012). In other words, following Haslanger and Haslanger (2012), critical realism perceives existence as depending on human experience on what the world should be like through a relational cause-and-effect approach. The critical realists' approach of relying more on empirical observations than on unobservable real natural events is not applicable in fields of study such as Electrical Engineering, Biomedical Technology and Somatology that are concept-based and which rely more on disciplines with structured rules that are unchangeable (Sayer, 2000).

Besides the empirical examination of a phenomenon, critical realists also apply a mixture of a wide-ranging series of positions. Such positions do not fit the description of true theories that are distinguished on the basis of their explanatory powers because they are perceived as not explaining anything (Hammersley, 2005). This paradigm further brings about internal contradictions regarding a critical realists' stance, particularly its position of questioning nature from the evidence derived from observable experiences to answer to their assertions (Rutzou, 2016). However, in the case of social realism, foundational rules of operation from disciplines into how social

activities of humans can be realised are critical in providing universal steps for determining the truth (Haslanger & Haslanger, 2012).

3.3 SOCIAL REALISM

The social realist theory rest its assumption on the basis that knowing and knowledge are connected (Maton, 2009) in the sense that people produce knowledge and know something about the world through their senses, beliefs and their own individual external experiences. However, features that determine knowledge emerging from how different people view the world and influenced by their social contexts, differ from knowledge found in the curriculum, thus making knowledge in the curriculum independent of the social location wherein it is produced (Maton & Moore, 2010; Maton, 2014a Muller, 2014). Since the interpretive paradigm follows the process of inquiry by seeking different views and experiences about the object of study, it aligns to social realism as it also recognises people's knowledge about reality, but places emphasis on systematic knowledge.

The focus of this theory is on epistemology, on how we first know the world through interaction with others or socialisation, and through schooling or HE curriculum, and thus requires the mode of assessment that promotes learning to be used. The theory highlight the simultaneous understanding of the socialness of knowledge and its truthfulness by illuminating the importance of scientific knowledge not for itself, but for its application back in a social context to improve human conditions in line with social justice principles (CHE, 2013; Maton & Moore, 2010; Muller 2014;Young, 2013a). In other words, truth or objectivity is sought to solve problems encountered by society. The theory has been used in this study to examine how students' development moves from the informal socialisation to an upward development by accessing another type of knowledge in the curriculum which is driven by assessment.

Social realism advocates for curriculum design and modes of assessment to be preceded by a formal well-grounded knowledge of social reality above informal knowledge, because the latter does not follow logical principles in the process of acquiring knowledge (Archer, 1995; Young, 2008). This implies that the logical and factual basis of formal knowledge acquired in HEIs, and in this context in UoTs, which facilitates

the process of students to learn more, enables the development of intellectual abilities and skills. It was upon this basis that the researcher chose the theory to be the point of departure in examining curriculum design and modes of assessment that enable students to learn and develop.

The theory was important in the study in viewing curriculum design and assessment from an angle of valuing of epistemic access to enable students to acquire foundational principles of knowledge that lay the foundation for other knowledge types, or the 'how' part of knowledge to be mastered. In UoTs, students access epistemic knowledge that is systematically packaged in the content of subjects of different fields. This systematic, factual knowledge is viewed as the highest level to direct the truth. Epistemic access through curriculum and assessment are elements that create a space for developing the mind, in order to develop thinking and logical reasoning that enable one to arrive at a level of truth or a level of objectivity. At the same time the truth is sought to be used to solve real problems that challenge the socialness of being, thus human socialness inclusive of values, beliefs and the social environment are recognised as areas that are to be subjected to a level of truth.

Unlike positivism, which regards knowledge as value-free and objective (Cohen, Manion & Morrison, 2011), and constructivism which views knowledge as socially constructed and segmented (Vygotsky, 1978), social realism recognises the place of cultural context of beliefs in their connection to factual knowledge which is free from bias, through learning values, logics and facts embedded in curriculum and assessed meaningfully to impact on student development. Since the theory does not seek to pursue the truth for its own sake, and because the truth or objectivity is sought to solve problems encountered by the society, the theory becomes the basis upon which meaningful learning is realised. Activities given to students that require them to solve problems and engage with communities, such as models UoTs have innovated in their regions, indicate that curriculum and assessment are used in line with the principles of social realism.

The implication of this theory on knowledge is that students already know something emanating from their different cultures, beliefs and experiences in the social setting. However, when students access HE, they expand the knowing they already have (Muller, 2010; Wheelahan, 2010) in order to know more and to understand reality in a

better light as well, and use knowledge and skills to solve problems that affect their social milieu.

Social realism guided the study in examining how curriculum that is selected has an impact on developing students differently, and whether modes of assessment are used to assess students' understanding of the content. Social realism, with its roots in people's experience of reality, offered a humanistic interest in addressing differentiation and social justice agendas by recognising the link between knowers' knowing and knowledge emerging from disciplines (Maton & Muller, 2007; Young, 2008; CHE, 2013). This implies that curriculum and assessment are viewed from a binary and complimentary mode, while the knowledge that society constructs is viewed as a social justice departure, when it is linked to the scientific knowledge for the betterment and growth of students. UoTs are the subject of this study since they use curriculum and assessment to integrate theory and practice, with theory being applied in practice in different ways, either in designing models, doing projects, through WIL or by doing their practice in a simulated or work situation. As a result, lecturers who have acquired more knowledge through their studies and experience from industries have the responsibility to explain the subject better by using content to teach facts packaged in the curriculum, and to assess students' understanding of facts and application thereof, through different modes of assessment. Through knowing from their experiences and beliefs and factual knowledge, students' development is impacted. It is thus pertinent that curriculum lays bare this knowledge which cannot be found in an informal context.

Universities, in this context UoTs, are viewed as academic institutions for the development and growth of students, particularly of their thinking abilities, so that their reasoning abilities are shaped, resulting in their being able to sift biases from facts and apply knowledge in their social context. Since curriculum is systematic, organised and classified under different subject-matter disciplines, it expands knowing and increases their knowledge to improve their social reality. Furthermore, social realism advocates for the connection and recognition of the social and the natural reality of knowledge. It was relevant in the study as curriculum design and assessment were viewed within a broader context to respond to social justice issues through the acquisition of skills and knowledge.

Social realism was important in the study in viewing curriculum design and assessment from an angle of valuing of epistemic access to enable students to acquire foundational principles of knowledge that lay the foundation for other knowledge forms, or the 'how' part of knowledge to be mastered. As a result, science is viewed as the highest level to direct the truth. Epistemic access through curriculum and assessment are elements that create a space for developing the mind, in order to develop logical reasoning that enables one to arrive at the truth or a level of objectivity. At the same time the truth is sought to be used to solve real problems that challenge the socialness of being, thus human socialness inclusive of values, beliefs and the social environment are recognised as areas that are to be subjected to objectivity.

Epistemology focuses on the nature and formation of knowledge and on how it is gained or communicated, and to develop the understanding when people defend their stances against foundational principles underlying a phenomenon (Scotland, 2012). Even though science and humanities use different codes or languages, the link between the two is necessary to accommodate the humanistic aspects of knowers and their personal attributes (Maton, 2009). Thus, social realism as a philosophical strand is concerned about people as a collective and not as individuals with own interests, and this has implications for moral responsibility on the part of society, through which knowledge in HE is expected to also be relevant for people to be able to use, to address social challenges (Maton & Moore, 2010). Furthermore, social realism focuses on the real nature of knowledge, truth, truthfulness, logic and the idea that the objectivity is determined on the basis of its link with society and in sync with disciplinary knowledge (Young, 2008). The theory considers the assertion that each form of knowledge has a unique role and purpose, and that some forms of knowledge are epistemologically more powerful than others (Maton & Moore, 2010).

The stance of this theory becomes relevant in this chapter in arguing that knowledge has a marked ontological reality which cannot be allowed to be lowered to the social (Young, 2010). As a result, Young and Muller (2010) are concerned about how HE and in this context, how fields of study like Somatology, Art and Design, Radiography, Logistics and Electrical Engineering, position and outline the role of different knowledge forms in the curriculum, including assessment strategies that are used in the process of developing students. The social realism perspective recognises both the social and the reality natures of the roles played by each strand. This implies that the

knowledge students bring along to the formal classroom situation is influenced by students' cultural experiences from their social world and it is impossible to separate such a knowledge from them.

At the same time, the truth about the real world is discovered when knowledge is systematically arranged. In this way the socialness and the objectivity of knowledge becomes part of the curriculum and assessment to steer learning. This also means that parallel to knowledge arising from people's experiences and practices in the social realm, knowledge found in theories embedded in disciplines is of paramount importance to provide epistemological grounding leading to truth about knowledge (Maton & Moore, 2010; Young, 2013a). In this way, there is a noticeable integration and movement of knowledge structures from the concrete to the abstract (Pinar, 2010). This allows curriculum to give a voice to the other social angle of the powerless found in these professional practices, including people who have wealth of experience. Hence a philosophical orientation which embraces a curriculum with two sides, representing both the social value of knowledge and the objective nature of knowledge, is adopted in this study (Barnett, 2006; Maton & Moore, 2010; Bernstein, 1983).

As asserted by Young and Muller (2007), a collective form of knowledge which can be validated goes beyond human thought or the experiences of individuals. For example, if an individual student has some knowledge or experience emanating from his/her background, there must be a difference between what he/she has learned at an institution of higher learning and what he/she knows from experience emanating from concepts. Knowledge is seen as imperfect and in need of justification to pursue the truth (Young, 2010; Maton & Moore, 2010). This means that the theoretical concepts students are exposed to in institutions of learning are definitely different from experiences students bring to the classroom. In the case of the Human Resource Management (HRM) programme under study, for instance, about 70% of the curriculum is predominantly theory based: students learn more theories for practice, and disciplinary knowledge is assessed more. Although the current HRM programme has been overhauled and a practical component has been infused at third year level, the theory component still dominates. Thus, the social realists' standpoint becomes relevant here in arguing that knowledge has a marked ontological reality which cannot be allowed to be lowered to the social (Young, 2010).

The contention is that while most jobs require certain practical skills, others require theoretical knowledge which is common to a community of specialists positioned within the disciplines (Young, 2008). HRM is one of the programmes that demonstrates the importance of a theory-laden content with minimal practice. Although simulations are used, they don't carry much significance and they are used minimally because they cannot capture real situations of how people react to things. As such, students need to acquire theoretical knowledge which can be used in different contexts, including challenging and complex situations. This implies that theoretical knowledge needs to take its rightful place in curriculum design to balance the equation. Moreover, graduates are compelled to acquire analytical skills and to have an inquiring mind that will assist not only in addressing the needs of the economy but to respond to the way in which economic aspects and societal issues relate to one another. Thus, curriculum design and assessment need to include theories and concepts to lay the groundwork for practice, and to prepare students to question stereotypes and the truthfulness of certain pronouncements.

The following features of social realism are discussed below: knowledge as real; knowledge and knower codes; the need for epistemological access; theory and practice; the need to complement the contextually-based knowledge, and the link between social realism and social justice.

3.3.1 The value of society's knowledge in relation to systematic knowledge

The value of social realism is its recognition of the social context as the playing field to expand on knowing by means of systematic knowledge packaged in the curriculum and modes of assessment used to develop student abilities so that they can use knowledge to solve real problems. Students enter higher institutions of learning from diverse cultures and bring along with them knowledge which is not coded. The aim is to sharpen this knowledge, as it is argued that the social origin of knowledge is affected by our cultural beliefs, while theoretical knowledge transcends the social level to a hierarchical level of complexity (Moore, 2009; Young, 2013a). According to Maton and Moore (2010), curriculum and assessment have to represent both 'truth and truthfulness' where knowledge is viewed from within, in its independent natural state, and externally, from a subjective social stance. In this context, the curriculum packaged in UoTs

programmes needs to convey this knowledge in a meaningful way such that students are developed to use it in the real world to benefit those who construct it. Thus, access to knowledge within a social context does not operate in a traditional positivist manner where scientific judgement is the only way of investigating a phenomenon, without looking at how science is applicable to the social context.

With reference to Radiography and Art as fields of study, the way knowledge is disseminated in the curricula is different from an Engineering field; since both fields of study rely predominantly on curricula that draw knowledge externally from professions and practice whilst the latter draws more on conceptual knowledge. According to Bernstein (1983), separation of the real from the social form obscures objectivity which society confirms to be true. However, the element of description according to which students are developed to organise their thoughts systematically and to reason logically is made possible by tapping into scientific principles about knowledge found in disciplines. Paying attention to specialist communities as the social locus of experiential training to broaden knowledge and connecting it to a practical context in Biomedical Technology for example, does not lead the programme to separate itself from specialised experience; rather it progressively embraces the objective truth. This occurs when students are taught concepts emanating from physics and medicine. In this way, although a link between theory and what students know from their experiences in the curriculum is created, there is also reliance on concepts to confirm the truth (Young & Muller, 2010). In Somatology as a field of study, on the other hand, both theory and practice are equally tapped into and integrated; for example, if a student fails either theory or practice, he/she does not pass the module because the two types of knowledge build upon each other.

3.3.2 A trajectory from knowing to knowledge

Maton (2014a) differentiates between epistemic and social knowledge. The former is referred as factual and objective knowledge, whereas the latter relies on subjective specialist experiences of individuals who assert themselves as legitimate knowers (Maton & Muller, 2007). In the same light, curriculum design in the field of Art and Design (and all the programmes clustered under it such as Jewellery Design, Fashion and Clothing, Fine Art and Graphic Design), in comparison with Engineering

programmes and Biomedical Technology, do not draw knowledge from disciplines like Mathematics, Chemistry or Physics. Although the former draws from concepts that are not grounded in natural disciplines, they draw more from practice and the experience of others in those professional careers through practical projects and work placement to develop skills. However, in those programmes practical knowledge is integrated with concepts to sharpen theoretical knowledge in the curriculum.

In the cases of Somatology and Hospitality, management knowledge is also drawn from disciplines and concepts and applied in practice. What is portrayed here is the idea that the role played by knowledge emanating from practice is equally important. However, disciplines give knowledge more scientific power. Although socially-produced knowledge cannot bring objective truth, the social dimension it possesses, emanating from the experience of specialist communities, is the social locus guaranteeing its approximation to objectivity (Young, 2008).

For students to apply knowledge they have acquired from theories in almost all the fields of study in UoTs, work integrated learning (WIL) and service learning are used to get speciality experience and skills from job-related contexts. The argument raised by the researcher is that, although conceptual knowledge is factual, knowledge that is developed from experience cannot be discarded or classified as inferior. Society as custodians of knowing rooted in knower practices cannot be separated from real knowledge (Maton, 2014b). As a result, the link between theory and practice appearing in fields such as Somatology, Art and Design, Hospitality Management, Radiography, Industrial Radiography and Logistics, in which a relationship between the knowledge code and the knower code is established, allows curriculum to enhance knowledge obtained from the social context to move to a vertical level. This occurs when integrating specialist experience with theoretical knowledge. Equally so, as postulated by Maton and Moore (2010), fields of study that draw more from disciplines displaying a strong association of epistemic relation to enhance objectivity and such practices maximise students' capacity to become factual. The implication is that if we lean more towards contextual knowledge derived from experience than on knowledge embedded in disciplines, students are left with a gap that hinders them from having descriptive tools that are used in unfamiliar contexts (Wheelahan, 2010).

Of course, although knowledge from the knower is considered as distinct, with the current re-curriculation, the theory component or content knowledge in most of these fields of study is more centrally positioned. This is so, in order to enable students as knowers to apply knowledge in a systematic way as supported by principles. In this instance, through theoretical content, human reasoning in fields like Art and Design and others is expanded because science makes sense when it is applied in a social space where knowing is constructed to allow social mobility (Maton & Moore, 2010). It can further be postulated that Engineering as a field of study, for example, cannot be studied for its own sake, but that knowledge obtained from such disciplines is applied by actors through human activities to interpret their world meaningfully by applying what is learned from theory in practical situations (Priestley, 2010).

3.3.3 The need for conceptual knowledge in the development of students

The purpose of HE is the acquisition of knowledge. This is referred to as epistemological access (Wheelahan, 2010; Young, 2008). The belief amongst most social realists is that academic disciplines contribute more towards internal growth and the creation of a scientific knowledge found in disciplines, referred to as theory about knowledge, what constitutes factual knowledge, and how it is communicated (Young, 2008; Wheelahan, 2010). Thus, the acquisition of factual knowledge needs to be carefully considered in relation to experience. In respect to Somatology for example, it can be said that through re-curriculation there is now a balance between theoretical content and practice. In the event that a student completes practical work, for example, and does not complete a unit in nutrition which is regarded as one of the basic theories, that student cannot proceed to a following year of study. A boundary should be observed between experience-based, contextually-bound and discipline-based, content-bound knowledge because disciplinary knowledge enables students to have a critical, inquiring mind in relation to their surroundings by establishing a link between knowledge and practice (Young, 2008; Wheelahan, 2010).

As asserted by Maton (2014a), curriculum design and assessment in UoTs as higher institutions of learning (HEIs) and powerhouses of scientific knowledge is critical. The role of UoTs in this regard is to enhance students' knowledge obtained from experience through academic knowledge. Hence, HE as one of the high value sectors which draws

from the natural reality, is expected to place epistemological knowledge at the centre of the curriculum and assessment (Bourdieu, 1977). What social realism means to the curricula of Somatology, Art and Design (inclusive of all its programmes) and Biomedical Technology, for example, is the relation between the social elements and the scientific elements of knowledge in the mentioned curricula. Significantly, this also includes assessment strategies used to develop the reasoning capabilities of students. The implication of this is that knowledge of Engineering, Radiography, Industrial Radiography, Logistics, Human Resource Management, Hospitality Management, Art and Design and others that are offered in institutions of learning, cannot be equated to that of the layman because of the pockets of scientific principles and theories supporting the curricula in these fields. As Young (2008) puts it, a systematic and specialised knowledge is found only in schools or HE curricula and not in everyday experiences.

In most of the countries in the world economy, the most valuable currency has become epistemic knowledge, and those who are able to acquire it are seen to possess meaningful ways of processing knowledge to cope with diverse problems surrounding human beings; they are the ones who demonstrate profound knowledge of things (Van Schalkwyk, 2002). For example, fields of study like Engineering, Biomedical Technology, Somatology and Human Resource Management, where curriculum and assessment place emphasis on theory, are in a better position to influence transformation. This is done by balancing what the curriculum offers to students as members of society in order to impact lives and changing people's thinking, while also enabling them to change poor conditions of society as beneficiaries through knowledge, which enlightens and gives them power to question things (Wheelahan, 2010).

Although Art and Design, Radiography, Industrial Radiography and other fields look more from the viewpoint of professional experience and the accumulated knowledge of specialised practice transferred to students when engaging in practical activities, discipline-specific methods of enquiry are also used. In addition, these fields can be classified as being weakly formed because they need the language used in the disciplines, with its explanatory power, to steer it from everyday knowledge to real knowledge. In the same vein, in Somatology for example, concepts and principles drawn from disciplines referred to as an epistemic approach to knowledge are also important because without theory the development of logic is impossible. Theoretical knowledge is needed to complement the predominant form of knowledge which is

drawn from culture, values of society, and experiences that are tied to context (Young & Muller, 2013).

For example, the fallibility behind the socially-produced knowledge of practice in Art and Design and Radiography provides grounds for seeking more opportunities to pursue higher virtues and the explanatory power of knowledge, which involves stimulation of thoughts to be able to support arguments with logical factual information (Maton & Moore, 2010). Hence, these programmes are currently being overhauled to heed the call of epistemological access through forging a relation between different knowledge forms and positioning theoretical knowledge (CHE, 2016; Maton & Moore, 2010). Relations between knowledge forms are necessary to bridge past racial inequalities. They are needed to promote not only skills for students to work mainly as technocrats in industries, but to also promote intellectual engagement and wider access, particularly by those who do not possess the intellectual power and knowledge of a group categorised as a dominant powerful class (Bourdieu, 1977; Young, 2008). This implies that, in their quest for knowledge, students are supposed to acquire concepts and principles that can assist them in investigating the truth, rather than just being able to display certain attributes or technological skills (Case, 2015; Keet, 2014).

The descriptive command found in curriculum with a strong base of theoretical knowledge which looks beyond the contexts is further perceived as 'rational' objectivity. It contributes to developing the power of students to reason and to examine others' scientific views (Maton & Moore, 2010; Bernstein, 1983; Temple, 2012). In line with Wheelahan's (2010) view about the value of disciplinary knowledge, it can further be argued that students' holistic development, when a design in the history of fashion is revisited (in Fashion as a programme in Art and Design), the aim is to compare trends and to trace the history behind fashion. This implies that the patterns, standard rules and theories that are universally applicable are used as a science behind the programme of fashion. In line with social realism, the aim of curriculum and assessment should be to broaden socially constructed knowledge (Maton & Moore, 2010). Hence, fields of study that have low epistemic power like Biomedical Technology and other programmes under Art and Design, need to be complemented by rules and principles emanating from disciplines to produce students who can interrogate and interact profusely with validated truths and grow intellectually, morally and emotionally (Wheelahan, 2010).

It is thus important to recognise the divergent roles of knowledge and their impact, while acknowledging the critical importance of social context (Young, 2008; Maton & Moore, 2010; Wheelahan, 2010). A fashion designer or graphic designer in the field of art, although relying more on processes in producing a design or drawings, also needs concepts to interrogate processes that explain why certain methods are followed and others not followed. This implies that students need to be able to analyse and explain what they do in practice, and this is made possible when they are introduced to and are taught fundamental laws drawn from disciplines, including scientific calculations, to lay the foundation of scientific knowledge which is not familiar to their social experiences. Polanyi (1967 cited in Muller, 2009) asserts that disciplines go through a peer review process which is evaluated by means of scientific rules. Curriculum design and assessment in all the fields of study, therefore, need to rely on theories to yield basic principles that never change, and which are accessed by students doing the same programmes in other institutions regionally or globally.

In line with the above assertion by Polanyi (1967 cited in Muller, 2009), this points to the value of knowledge drawn from disciplines in the curriculum outline of different fields of study, which confirms that certain kinds of knowledge have more weight than others, and disciplines as the springboard for the production and creation of new knowledge must be accessed by everyone (Young, 2013). Morrow (2007) states that by tapping into disciplinary ways of thinking, epistemological access, which requires systematic and logical engagement to relate to a greater intellectual power, is established. Neglecting this power, particularly in a UoT context, puts knowledge found in the curriculum at risk as it does not only destroy epistemic access but also impacts negatively on the type of graduates that need to be produced. Hence, the concern for social realism is about the epistemological truth of how we come to know the world and it rejects a compromise about knowledge which relies on subjective beliefs which cannot progress to truth or truthfulness. This is posited as a concern in curriculum design and assessment of fields of study that do not balance practice and conceptual knowledge. It is thus argued that being real implies connecting to knowledge found in the real world to develop logic, which will in turn transform people's thinking and how things are expected to be done (Maton, 2014b; Moore, 2007; Young, 2013; Wheelahan, 2010). This implies that reality of knowledge opens up opportunities for curriculum and assessment to allow students to use their thinking up to an abstract level.

Furthermore, it may be said that students learn what they are exposed to. If the type of knowledge they learn is practically-based, they will be influenced by that type of knowledge. This was the case in the erstwhile technikons, where curriculum and assessment contributed in training students as technicians and technologists for technical and skilled labour. However, if the curriculum and assessment expose students predominantly to conceptual knowledge, the results will be different because principles accompanying it are flexible and allow students to use knowledge in different environments (Maton, 2009). For example, in Somatology, third-year students write the international CIDESCO examination, which is also written by Somatology students in other countries. In Electrical Engineering, as a further example, student collaboration between a certain UoT and a German university of technology, which offers students a platform via Skype to share their knowledge and skills and to learn best practices, revealed that although there might be gaps in technological skills relating to the advancement of infrastructure in highly developed countries, the theory is universal. This indicates that the same theories in similar subjects can be used by anyone in any country. The implication is that students developed through a curriculum that places theory in the centre of curriculum and assessment can cross the boundaries and will be prepared to think innovatively.

3.3.4 Theory and practice

UoTs, with their two-way approach to curriculum which focuses on theory and practice, are expected to bring together the socialness and the objectivity of knowledge by sharpening the thinking abilities of students whilst also developing them to occupy a space in the world of work. Individuals are part of a collective where societal norms and values are cherished as part of the historical background and the roots upon which a society builds its identity to transfer its knowledge for social mobility, which Fataar (2009) refers as social cohesion and not individualism.

Pinar (2010) postulates that the hierarchical structure of curriculum moves from the concrete to the abstract. This implies that recognition has to be given to both practice and theory in curriculum design and assessment. The practice and theory components of the curriculum design of Somatology each carry a 50% weight, while in Human Resource Management and Hospitality Management the weight allocated to theory is

higher than that allocated to practice. In fact, the discovery of truth about reality through theories and concepts makes theoretical knowledge more valuable. Besides this, specialists in the process of teaching and learning also need to indicate the selection, sequencing and pacing in different programmes to enable proper organisation of knowledge (Daniels et al., 2009).

According to Maton (2014a), society is classified into prominent classes which also have sub-categories. UoTs as domains of knowledge also fall into this dominant class, and they are distinct because of the different fields of study that draw from conceptual knowledge and also from professional practice. Fields like Engineering for example, draw heavily from disciplines such as Physics, Chemistry and Mathematics as determinants for rules of nature, and students have to know the rules or concepts first in order to draw from them when applying their knowledge in a social context. It is expected that before an engineer designs a model, be it a bridge or a model to save electricity, there is need to ascertain the impact of application on end-users. This is congruent with Maton's (2014b) analysis of 'relations to social knower codes' which refers to links between knowledge forms that are to be observed as recognition of the relation between structured and unstructured parts within a field of study. These different parts form a synergy that embraces knowledge aligned to science and that which comes from social experiences or culture (Maton, 2014b).

As espoused by Maton and Moore (2010), an intersection of theory and practice is the norm in social realism, therefore displacement of knowledge is out of the question. Through the legitimacy code approach, knowledge is perceived through relational powers wherein knowledge sites are found to complement each other to bring the knower, the known, and their varying testimonies together (Moore, 2013b). Furthermore, relations that unite categories of classes in terms of knowledge types or classes are important. Thus, HE is not only regarded as an intellectual domain providing specialised knowledge, it also falls into a dominating category in relation to knowledge emanating from practices and experiences.

As posited by Gamble (2006), disciplinary knowledge takes place by integrating meanings, and moves society beyond the everyday cultural, local, context-based knowledge to the future world of connections. A link is thus created between events and objects that are different and are not related to one another (Gamble, 2006). For instance,

in Somatology before re-curriculation started, curriculum was formed by many generic subjects that were not content-specific. The new curriculum knowledge, however, is drawn from Biology, Physical Science and Psychology, and each practical part needs more theory. A similar link is also noticeable in the Hospitality Management programme. There is a linkage between theory and practice and theory forms the basis upon which practice unfolds. In general, in Hospitality Management, theory constitutes about 67% while practice covers about 33% of the curriculum and the two are integrated.

Art and Design and Radiography, for example, are fields that can be placed in a category which accommodates knowledge emanating from practice. Hence, industries and professional practices are considered as sites that provide students with cumulated knowledge of how things are done, and this is where theory and practice unite. Knowledge from these fields of study are examples of unstructured sites of knowledge; they are a trajectory to intellectual levels that are supported by theoretical sites. This is a complementary relation which social realism maintains, to elevate real knowledge in the sense that socially derived knowledge is spontaneous and stems from cultural beliefs. When students learn to reason through theory, voice to knowledge is established from a social site of those who initially did not have the intellectual power. In other words, different sites of knowledge forms are brought together and differentiated according to their roles without putting the one below the other (Maton, 2014b).

In addition, Maton (2014b) juxtaposes different perspectives of Bourdieu and Bernstein about knowledge forms as epistemic relations. In relation to fields of study like Radiography, Logistics, Industrial Radiography and Art and Design, for example, which are largely framed by knowledge supported by experience and professional practices, it means the teacher as the knowledge expert must take the reins in introducing theories as structured forms of knowledge to enhance these fields of study. Participation of those where knowledge originates and towards whom knowledge is aimed, is required; and how they access it is an important dimension (Maton, 2014b). An approach which brings in fields of study that are not strongly aligned with disciplinary structures in facilitating a trajectory towards the truth of knowledge, is supported by Bernstein, (1999) while Bourdieu (1977) cited in Maton (2014b) introduces a flexible approach to maintain a relation of equality from both the objective and subjective sites of knowledge.

The figure below shows how different forms of knowledge interact.

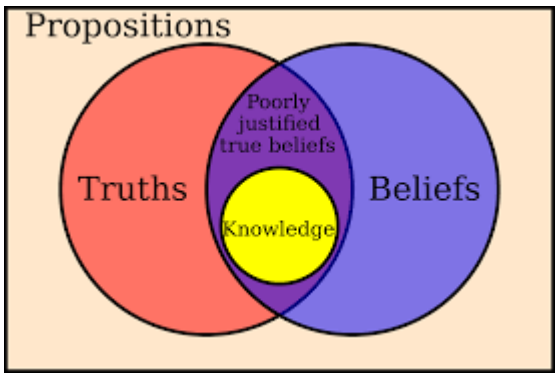

Figure 3.2: The intersection between origins of knowledge

The illustration above depicts the truth as being obtained from the natural reality or science embedded in disciplines as the point of departure to obtain propositional or factual knowledge. Certainly, both theoretical and procedural knowledge integrated in different fields of study are important and complement each other. As such in the curriculum design and assessment of different fields of study, there is a need to consider teaching concepts before teaching procedures (see Wheelahan, 2010; Gamble, 2006; Moore, Arnot, Beck & Daniels, 2006). In addition, knowledge embedded in disciplines provides factual knowledge to justify beliefs through the foundational principles underlying it (Maton & Moore, 2010).

For example, a skilled tennis player no longer reflects on rules, but instead applies knowledge; this implies that both theoretical and procedural knowledge are equally important and need to complement each other. Similarly, UoTs as higher institutions of learning in developing students' intellectual abilities are expected to employ assessment discourses that reflect equally on the two types of knowledge (Zhang, Scardamalia, Reeve & Messina, 2009). Besides, separating knowledge from skills can impact negatively on assessment, as one type of knowledge is elevated in the curriculum at the expense of the other. UoTs, embracing the two knowledge types, are strategically in a better position to influence transformation by balancing knowledge forms offered to students; as members of society they are expected to change their poor conditions through knowledge which empowers them to make judgements, and to uphold moral and civic responsibilities in their social world (Wheelahan, 2010).

Hopes are pinned on UoTs, as institutions of higher learning, to follow curricula and assessment strategies that advance students' hierarchical route of objectivity based on scientific knowledge, to improve practice in logistics, bio-technology and art, for example. To that end, curriculum and assessment which embed tenets of social realism that tap into the socialness of students and the natural reality are necessary to develop both skills and intellectual abilities of students uniformly. Thus, neither a constructivist relativism focusing on experiences and learning environments nor theories that lack an objective basis to justify facts are adopted in this study. The reasons, as alluded to above, are that, firstly, social realism recognises both the social nature and the objective nature of knowledge about the world; secondly, it positions knowledge at the centre of curriculum; and thirdly knowledge is accessed for the public good as a form of social justice to improve the lives of different societies (Maton & Moore 2010; Fataar, 2009). Basically, the strength of social realism lies in the fact that it considers a developmental growth of knowledge from where it is formed in a social context, while progressing towards the vertical level of the physical world, leading to the development of abstract thinking through which theories and principles contained in disciplines can be applied to interpret facts and justify the truth (Maton & Moore, 2010).

In essence, the relation between the cultural space from where students come and how they are developed serves as a platform for moving from the informal form of knowledge to the formal level of orientation for further growth, to access what Young (2008) refers as 'powerful' knowledge, which implies making people think more deeply about their world and stretching the power of the mind to direct social interactions in an orderly manner (Young 2015; Wheelahan, 2010). The concept of knowledge is an embracing term which covers all that develops and empowers. It can be classified into two elements, namely knowing what makes up a phenomenon emanating from a systematic description of things associated with the natural realm, or knowing how to do something as seen from others who are experienced (Gibbons, 2000). It may be argued that there are divergent manifestations of reality in theory and practice found in UoTs; however, they are not embraced equally in the curriculum design and assessment strategies in some of the different fields of study (Young, 2013; Morrow, 2007).

3.3.5 The need to complement contextually based knowledge

Everyday knowledge, derived from social contexts, is integrated at lower levels and is characterised by specific, segmented, contextually-bound units. It is the product of parts of knowledge which are not linked by rules or relational principles, in comparison with disciplinary knowledge, and is based on situational contexts which submit to everyday, common-sense knowledge arising from the daily problems of living, such as living and dying, that are more local and specific. This location of knowledge in the knower's subjective human experiences not only disempowers it, but also compromises the universality thereof (Bernstein, 1999; Shay, 2013; Rata, 2012).

Contextually based knowledge, in contrast to disciplinary knowledge, does not follow an integrated system where meaning is established through principles or rules. Instead, knowledge is acquired through a segmented selection of specific, practical contexts of local situations. This implies that if one is taught the rules pertaining to a context, one cannot simply apply the same rules to another context. For example, the rules that are applicable to tennis may not be applied to driving a car, as each context is separate from the other. Similarly, in Somatology, if students fail the theory component, they will not pass a module because practice depends on the theoretical part. This scenario indicates that the usefulness of everyday knowledge depends on theoretical knowledge which is discipline-bound (Gamble, 2006; Wheelahan, 2010).

Emanating from this scenario is the idea that while Art and Design programmes, Radiography, or Industrial Radiography, for example, are more practically based, curriculum design and assessment must also draw from disciplines so that students are able to succeed when they are faced with contexts that are different from the ones they are used to. A balanced curriculum maintains a strong link with the parent discipline which houses the vertical structure of knowledge. However, a weak link can destroy the systematic, logical sequence that characterises theoretical knowledge. Thus, other important aspects of knowledge are missed, and quality of the curriculum is compromised (Gamble 2006). The implication is that in UoTs both theoretical and procedural knowledge are equally important and complement each other. It therefore becomes sensible to consider teaching concepts before considering teaching procedures (Wheelahan, 2010; Gamble, 2006; Moore, Arnot, Beck & Daniels, 2006).

This does not mean that knowledge emanating from different experiences and cultural backgrounds is not important. Rather, it needs to be improved by means of tried and tested principles (Wheelahan, 2010). Alves (2015) warns against the sole application of everyday knowledge due to the danger of developing individuals with a limited view of reality. Similarly, the co-existence of different knowledge types needs to be recognised as it constitutes a relationship between science and society (Nowotny et al., 2003). The recognition of the mutual benefit of science and society communicating with each other through people constructing knowledge while applying scientific rules to their contextual space creates an upward trajectory in terms of apprehending reality (Vygotsky, 1978). Hence it is asserted by Wheelahan (2012) that there is a need for science to assist society in solving social challenges.

3.3.6 The link between social realism and social justice

The complex problems facing humanity today, namely poverty, inequality, HIV/AIDS and climate change to name but a few, are interdisciplinary; disciplinary and other forms of knowledge need to be blended to transform the world. As postulated by CHE (2016), the idea of human value is high on the national agenda, with the expectation that through curriculum and assessment, universities must produce graduates who will benefit their communities. As a result, curriculum is expected to empower and transform students to respond to factors that inhibit them from having a voice in the process of teaching and learning (Fataar, 2016; Fraser, 2009). The implication is that social justice as addressed through curriculum and assessment in UoTs should not make students into technocrats or mere recipients of disciplinary knowledge that is separated from their social experience, and so cannot be used to solve problems in their social worlds. In Radiography, for example, interactions are made with society during students' work-integrated learning when students empower communities with knowledge about breast care; this is aimed at sharing scientific knowledge in a manner that will improve the health of people.

According to Zipin, Fataar and Brennan (2015), classical accumulated knowledge emanating from both social structures and theory, which finally transcends into disciplinary knowledge, needs be considered as the starting point for developing curricula. This is the case in most fields of study, including the current Art and Design

programme, for instance, which used to concentrate more on practice, but which has now increased the emphasis on theory. Muller (2009) asserts that curriculum and assessment grounded in social realism allow access to the social foundation where knowledge originates, with the expectation that knowledge must benefit the society from where it comes. In line with the tenets of social realism, curriculum and assessment at UoTs resonates with the Constitution of the country (Republic of South Africa, 1996), drawing from conceptual knowledge to be able to commit to principles of equality and respect for human dignity. This is coupled with a call to meet the economic needs of the country, but at the same time, to contribute to research and to equip society with knowledge which will enable students to organise their thinking in a structured manner (DoE, 1997).

According to Maton and Moore (2010), society subscribes to certain ideals that identify individuals as human, and it is important that their values and identity be recognised in the curriculum design and assessment strategies that are employed in HE as a social justice issue to sustain independent thinking (Muller, 2009). If students are exposed to other knowledge forms, they can learn to correct biases and to transform certain erroneous approaches in their surroundings. For example, a student in the field of Art might use painting or sculpture to express human challenges, while a student in Engineering may use a complex scientific design such as a 3-D printed hearing device to address a human challenge.

As asserted by Giroux (2011), students who have been trained mainly for the workplace after completion of their studies do not offer communities their knowledge and skills. According to the researcher they leave no time to plough back knowledge to their immediate communities as a form of empowerment and transformational change resonating with the African communal cultural norms and values that would arise if HE were to share its expertise with communities. In the context of UoTs, where research is critical, principles found in disciplines are important to lay the foundation and guide practice to enable students to acquire what is described as ‘powerful’ knowledge (Young, 2008; Wheelahan 2010). Students from the fields of Art, Radiography, and Logistics, just like Engineering students, require laws and principles to explain reasons behind their practices to advance scientific research that will benefit society. This is done through community engagement and service learning whereby students share scientific knowledge with communities. Some examples here are education and

awareness on breast cancer done by Radiography students; Electrical Engineering students sharing with the community ways to save electricity; Art students assisting with design in the refurbishing of a municipality; or Logistics students applying principles of social responsibility.

Preparing students for the workplace situation without challenging them to connect with their physical world challenges becomes a problem for society: it does not help to have technocrats who will not be able to solve social problems (Giroux, 2002, 2011). When students from UoTs fulfil the requirements of their respective academic programmes and eventually graduate, they join communities which are overwhelmed by socio-political misfortunes and constant social change. As knowledgeable and skilled graduates, they are expected to use their skills not only in the market place, they are also expected to share their knowledge in civil matters in their respective communities (Giroux, 2011). Thus, curriculum and assessment should develop analytical thinkers and responsive citizens who can critically engage in deliberations relating to values and morality in the curriculum to build communities; this is necessary to allow the curriculum to commit to social justice issues (Badat, 2009; Soudien, 2010). In fact, to ensure the total growth of students, the curriculum must include all elements that build and translate knowledge and values that enable students to recognise humanity (Barnett & Coate, 2005). In other words, social realism attempts to recognise the socialness of people and their presence in the real world.

3.4 THE EPISTEMIC AND SOCIAL VALUE OF KNOWLEDGE

Shay and Steyn (2016) add that the epistemic and social components of knowledge are not equal and that one cannot be derived from the other. This assertion is supported by the idea that teaching and learning anchored in theories, concepts and coherent scientific rules inform practice. Thus, curriculum design and assessment in different fields of study are critical to engage students in transformational ways of teaching and learning that give them a platform to sharpen their way of thinking in order to understand, question and transform their surroundings. Case (2011) asserts that the two discourses underlying curriculum in South Africa, namely the vocational and the liberal, need to be acknowledged, but the distinction between formal and everyday knowledge needs to be ensured. Caution needs to be exercised to not conflate the two knowledge forms,

since the issue of quality is likely to affect intellectual discourse because the one component possesses more universal principles and elements of higher intellectual capacity than the other (Le Grange, 2011).

Nevertheless, there is a challenge in terms of what really counts as knowledge components inherent in different forms in HE. This is a challenge that needs to be addressed in developing students adequately and holistically (Gamble, 2006; Favish & Macmillan, 2009). Furthermore, the disciplined, conceptual or abstract approaches use idealised instead of empirical, evidence-based models. Their main strength lies in the fact that they are open to comparisons unlike Mode 2 knowledge production, which is defined as knowledge based on experience. Evidence of knowledge drawn from disciplines can, for example, be drawn from successful idealised models, such as Einstein's gravitational theory and Galileo's geometrical and mathematical model, which do not fit exactly into reality but are capable of being refuted scientifically, and of contributing towards the generation of new knowledge (Bernstein, 1999 cited in Rata, 2012). These authors also indicate that such classical models follow the intellectual, rational, objective line of thinking, which allows for substantive facts accompanied by rules, principles, and comparisons to make knowledge reliable and verifiable. What is raised here is the fact that experience is the foundation of knowledge. However, unlike theoretical knowledge, which is based on comparable and evidence-based knowledge, experience alone, as a component of knowledge, is neither enough nor verifiable. The implication is that a curriculum which neglects or displaces a theoretical dimension of knowledge is unbalanced.

Maton (2014b) points out the connection of the distinct knowledge structures in terms of their epistemic element of legitimate facts and the social element of knowing emanating from beliefs or social experiences. Admittedly, the accumulation of scientific knowledge, and knowledge accumulated through experience, both matter in the endeavour to achieve educational goals. In addition, teaching and learning anchored in theories and concepts following coherent, scientific rules have been reported as effective, which proved to be the reason why New Zealand decided to follow the principle of assessing conceptual knowledge in its educational activities (Milligan & Wood, 2009). This endeavour indicates the importance of conceptual knowledge in the curriculum in terms of bringing in aspects of the unknown world and assessing them as such (Milligan & Wood, 2009). Moreover, the unknown world is represented and made

meaningful through disciplinary or conceptual knowledge. To some extent, this elucidates the duality and distinctiveness of the knowledge structure and represents different values and discourses when describing the world, a position which is strongly supported in social realist circles (Fenwick & Edwards, 2014).

Important questions that the curriculum needs to answer in relation to students is what they know in terms of theoretical knowledge and what they can do in relation to procedural knowledge. Undeniably, professions rely on distinct types of knowledge based on theoretical knowledge (Young, 2010). Arguably, a curriculum must start with content, which will be developed further into practice. Other than that, education should not be reduced to mere job training. As asserted by Bernstein (2000), democracy is founded on theoretical and abstract knowledge which embraces values and norms. Therefore, theoretical knowledge is critical in terms of complementing other forms of knowledge.

Theoretical knowledge provides students with the ability and language to be able to debate and participate in issues that surround and threaten their being in the society in which they live (Wheelahan, 2010). Having observed some of the challenges that students encounter when it comes to analysing and critiquing texts, it appears that the notion of blending different types of knowledge in a curriculum, and the alignment of assessment tasks to appropriately measure both knowledge and skills, can be adopted. In addition, the notion held by social realists that curriculum needs to continue to differentiate between the two types of knowledge becomes eminent in this discussion. Clearly, the issue of reconceptualising curriculum and assessment becomes even more important in assimilating and restoring the focus on concepts and the value of disciplines in the development of higher-order cognitive skills.

3.5 CHAPTER SUMMARY AND IMPLICATIONS FOR EMPIRICAL STUDY

This chapter has shown the importance of a theoretical framework by positioning the study in a theory which recognises the relational positioning of different knowledge forms in the curriculum design and how meaningful ways of assessing students can deepen knowledge. Knowledge and skills are differentiated and pursued to mark the distinctiveness of a UoT from any other public entity.

Tenets underlying different theoretical perspectives presented in this study are discussed, while attention is drawn to the common element in the social origin of knowledge which is evident in all three theories discussed. With reference to social realism, the synergy between knowledge constructed by people and the influence of disciplines through their foundational grounding of principles and concepts is also discussed. The idea of objectivity and truth of knowledge in curriculum and assessment provides the main leverage in ordering knowledge systematically and contributing towards developing students' reasoning powers. Overall, on the basis of the social realism perspective, the conclusion drawn is that for graduates to be properly developed, curriculum design and assessment need to maintain a balance between theory and practice.

The next chapter will therefore describe and explain the research design and methodology this study has utilised in eliciting qualitative data with regard to curriculum and modes of assessment alongside with interpretive design assumptions of reality.

CHAPTER 4 : RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

The previous chapter covered different theories and selected a theoretical perspective locating the study. In order to find answers to the issue under investigation, a scientific design is necessary. The research design for this study is interpretive and it uses qualitative methods to analyse data as guided by research questions. Chapter 4 provides an outline of the framework behind the methodology chosen and how this relates and contributes towards enriching the data collected. The sub-sections describe the chosen research paradigm, interpretive research assumptions including the methodology and approaches, sampling, instruments used to collect data, sources of data and processes behind data analysis.

4.2 RESEARCH QUESTIONS

The following research questions on curriculum design and assessment guided this study:

- In what ways have past practices of technikons influenced curriculum design and assessment in UoTs?
- To what extent does the nature of knowledge shape curriculum design of various fields of study in UoTs?
- How do the curricula of different professional fields of study at UoTs prepare graduates for the changing market and employment?
- How do assessment and curriculum of different programmes in UoTs prepare graduates to address issues of social justice and other challenges of the 21st century?

4.3 RESEARCH DESIGN AND METHODOLOGY

4.3.1 Research design and methodology

A research design is a plan for a study that describes the type of study and the overall framework on how the process of inquiry and collection of data is to be undertaken (Dawson, 2009; Creswell, 2014). The research design was used in this study to communicate the problem statement, and find evidence, to answer the problem statement, while the research methodology assisted the research inquiry in following an a systematic procedure through the use of different data instruments and approaches (Dawson, 2009). In this study a scientific inquiry which categorises objects into abstract laws like positivism or realism was not used, but rather the focus was on the social experience of lecturers, students and HoDs, and on how they view curriculum and assessment in their external world, thus bringing out subjective epistemology and the ontological principle that truth is socially constructed (Merriam & Tisdell, 2016). It is this subjective view of reality of the participants, upon which data was generated.

4.3.1.1 An interpretive paradigm

As posited by Kuhn (1970), an interpretive paradigm reflects the researcher's belief or world view, to find answers to issues, by choosing methods that fit the purpose, including assumptions that relate to ethics and epistemology (Kuhn, 1970; 1977). Notably, an interpretive paradigm aligns with the researcher's beliefs that people have knowledge about reality and it was upon exploring reality from the perspective or lens of individual participant descriptions, beliefs, values and reasons that they interpret their reality (Denzin & Lincoln, 2012; Dawson, 2009) about curriculum and assessment that the researcher could find answers to the research questions and realise the objective of the study. The researcher's close interaction (Cohen et al., 2011; Creswell, 2013) with students, lecturers and heads of department (HoDs) who were experiencing and were dealing with the phenomenon under study enabled the researcher to gain insight into the problem being investigated. Since a grounded interpretive theory uses inductive methods in the generation of data, the researcher did not dominate the participants; rather the researcher allowed participants to share their views freely, and qualitative data was elicited.

Since the interpretive paradigm adopts phenomenological strategies that embrace the subjective view and perceptions of social actors, data are described narratively, which involved focusing on the day to day interaction of lecturers and students in relation to the curriculum and assessment in universities of technology. The researcher in this study uncovered information mainly from the views of students, lecturers and HoDs on how they interpreted their social world. Significantly, lecturers and students, in the context of institutions of learning, were used as essential sources to interpret the situation and the researcher gathered information from their different beliefs and perceptions of reality. Participants offering different programmes at UoTs shared their views about curriculum and assessment which assisted the researcher to obtain a richer understanding of the phenomenon under investigation.

Interviews yielded insight and understanding of the behaviour displayed by the social actors by explaining their actions and perspectives since they use curriculum and convey it to students. The reason for the researcher to interact with staff was also to find out how curriculum and assessment in different programmes contribute towards the development of students. This was done in the comfort of their offices in different UoTs where they work, with such an environment and the rapport that was built before interviews were conducted, allowing participants to air their views freely and to answer the research questions posed to them in an interview session.

As the beneficiaries who are impacted upon by curriculum and assessment for their development, students were also involved through an open-ended questionnaire which they answered freely and independently without the researcher interrupting them. Classroom observation, where the researcher could see student behaviour, gauge attitudes, listen to how they engage with the subject and see how they were assessed, was also undertaken. In relying on the views of the lecturers, HoDs and students, the researcher gained insight from the angle of social actors on how they perceive and construct their world, which coincides with the theory guiding the study with its starting point at the contextual level where knowledge is located and recognising the knowledge and interpretation people have of reality before advancing to the complex level of epistemic access.

An interpretivist paradigm allowed the researcher to make sense of the history of UoTs including how changes in the curriculum and assessment as objects of the study

impacted on the development of students and how lecturers and HoDs feel and think about it. The researcher ensured that data elicited from participants was interpreted well through the use of a video recorder and taking notes. Eliciting data from participants thus confirmed the idea that knowledge related to the social world can only be understood if social actors are involved in it (Cohen et al., 2011). The focus was on drawing out individual experiences and perceptions using interviews and other instruments in line with the topic under study. Interviews with students, lecturers and subject heads who were involved with the phenomenon under investigation were used as one of the data instruments to collect the relevant information. Their individual experiences, beliefs and perceptions were useful in indicating how issues relating to curriculum and assessment have an impact in determining students for the future; this included the impact of curriculum design, and the kind of assessments used to elicit skills and reasoning among students.

In this study a positivist paradigm which ignores a social justice principle by not recognising the social context and views of participants where knowing originates towards advancing epistemic access was not chosen, because it does not allow the intersubjective interaction the researcher establishes with the participants to find out about their views regarding the phenomenon under study. It was also not chosen for this study because it focuses only on what is empirically observed, which implies that things that cannot be seen, such as people's views, thoughts or attitudes, are not taken as valid evidence of knowledge. Furthermore, it does not align to the social realism thinking as an alternative philosophical lens emerging from the sociologists and curriculum studies background that recognises and relates to the social context of knowing, yet insists on access of the higher level of knowledge for the success of students.

Neither was a constructivist relativism approach adopted for this study as it focuses more on how learners learn than on knowledge itself (Temple, 2012). The researcher used an alternative lens which does not view knowledge as neutral or as segmented and context fixated. However, knowledge is seen as a feature of curriculum and viewed from a sociologist social realism lens, which allows the development of students' thinking abilities to be examined on the basis of the different knowledge forms, and how access to scientific knowledge impacts on developing students' logic to perfect them. The lens was in harmony with the interpretive paradigm to serve as a philosophical base for the study; to examine curriculum design and assessment in UoTs by involving those who

deal with the phenomenon; and to clarify how they give meaning to knowledge found in the curriculum and learning enhanced through assessment. This was done by examining the nature of knowledge in the curriculum and assessment within the confines of the interpretative assumptions, such as the nature of reality, or ontology as a form of being regarding how social actors construct knowing by relying on their subjective views, and on how they accessed theoretical knowledge.

4.3.1.1.1 Phenomenology

In this study, the researcher used methods such as interviews to elicit data from participants in their natural setting using research questions, to elicit information and coding it into themes and logically interpreting it to describe and analyse the data drawn from participants. The importance of applying logic was that it should benefit and enhance understanding so that the researcher may interpret data accurately. This further connected with social realism in emphasising the systematic knowledge needed to develop students and to enhance logical thinking (Maton & Moore, 2010; Carless, 2015).

Also significant is that different paradigms have differing ontological and epistemological views which include assumptions about reality and knowledge that underpin their individual research approaches (Cohen et al., 2011). These assumptions include the following: ontology, epistemology, axiology and methodology as well as their relationships.

4.3.1.1.2 Ontology

Since ontology is a perception about reality (Cohen et al., 2011) found from a number of angles, the researcher used different methods to interact with different sources, which included lecturers, students, classroom observation, policies and documents to be able to get answers to the research questions and to achieve the objectives. To obtain meaning from data collected, the researcher took the position of analysing reality as shared by the participants by using logic to interpret what was heard, seen, and felt. This implies that people's construction of the social world is sufficiently significant for the researcher to obtain information.

4.3.1.1.3 Epistemology

Since epistemology focuses on the manner in which we know what we know, what participants know about their social world, in this instance finding out the knowledge participants know about curriculum and assessment, was the appropriate first point of departure to elicit information. Notably, the interpretive paradigm recognises a relationship between knowledge itself and those who are its co-constructors in synergy with social realists, as a relevant theory to guide this study, to strengthen and assist in getting an in-depth understanding of the object of study, because the interpretive paradigm starts first with what the social actors know about their social reality (Cohen et al., 2011; Guba & Lincoln, 1994; Maton & Muller, 2010).

4.3.1.1.4 Axiology

Axiology refers to values to which social actors ascribe that are recognised by the researcher and are clearly articulated between the researcher and participants (Creswell, 2013). Before interviews were done, the researcher applied for ethical clearance and followed protocols requested by other universities where interviews were to be held. To those who were interviewed, the researcher articulated the purpose of the research and made sure that ethical considerations, privacy, and confidentiality were ensured. The researcher also explained that the views obtained from participants would be reported anonymously and used solely for research purposes. Where needed, the necessary approval was obtained, and participation was also done on a voluntary basis. It is also significant to point out that value-free knowledge is impossible because when using an interpretivist paradigm, the researcher asserts own beliefs when interpreting the data (Creswell, 2013). In this study human values were not set aside when the researcher logically interpreted data.

4.3.1.2 Qualitative research approach

The reason for using qualitative research in this study was because qualitative rich data was sought. As the focus of the study was on a social issue that exists in the domain of the world where people live, it was deemed fit to use a qualitative approach to allow implementers who are interacting with curriculum and assessment in their daily social

space to share their experiences. In this context, students who are affected by the object of study were worth listening to, as to how they are affected by the subject under investigation, and also staff members who have knowledge, expertise and experiences about the object of study. Qualitative research was also used in this study because both the approach and theoretical framework guiding the study's point of departure are the views of social actors about reality. To that effect, participants' experiences, views, and beliefs on what their programmes entail, and how assessment is used in the development of students, helped the researcher to understand the subject better.

Qualitative research methodology describes data in words rather than in numbers (Creswell, 2013). The researcher was therefore interested in understanding the meanings that participants constructed, that is, how they made sense of the type of knowledge located within the curriculum and expressed through assessment. The emphasis was more on the quality and depth of the information and not so much on the scope and breadth of the information provided. Creswell and Poth (2018) assert that the qualitative researcher is the primary instrument for data collection and analysis. Thus, the researcher had to accept the position of being part of the experiences that were shared and articulated by participants while engaging in qualitative research. The researcher thus became a part of the investigation as an observer, a facilitator by using the right techniques to draw meaning from the participants, yet detaching herself from the situation to reconsider the meaning behind the participants' experiences.

The qualitative approach is interested in seeking answers about a phenomenon to find meaning in people's experiences of the subject under study through intense involvement with the participants (Creswell, 2014). As a result, the researcher's involvement entailed the formulation of research questions, the creation of a rapport and probing to find more answers to questions posed to participants about curriculum and assessment. As a result, data were collected in line with natural and subjective ways in which participants view their reality, thus reliance was on the descriptive data of students, lecturers and HoDs who described and elaborated on the phenomena under study, using words instead of numbers (Creswell, 2013).

The assertion is that qualitative data is generated through interaction with participants (Creswell, 2013). Interacting with participants to examine how they give meaning to their social world, provided a good basis for the researcher to understand the depth and

breadth of the nature of reality as experienced by the participants. This included information on how the two forms of knowledge in the curriculum and assessment impacted on lecturers and students respectively, and how in turn they contributed towards unravelling some complexities that societies are faced with, such as systematic inequities, unjust policies, social justice issues, national and international trends, and the power wielded by those who are in authority (Maxwell, 2012; Rubin & Rubin, 2012; Denzin & Lincoln, 2012; Creswell, 2013).

Participants provided information in the form of narratives and interview responses. In this study a qualitative design was used as a means of understanding the meanings the participants ascribe to curriculum and assessment, and the types of knowledge inherent in the curriculum. Obtaining such an understanding required a process of interaction with participants, being amongst them to listen, and acquiring a feeling of how they understand their world. This was achieved by using interviews with questions and sitting in a class to listen to how students use their reasoning power to analyse and interrogate challenging areas in the curriculum. It also included examining the teaching and learning strategies that were effective in allowing critical discourses in a classroom situation, including students' engagement with social issues in their civic space, as provided by the type of assessment strategies that were used as well analysing various contexts of the participants.

In this instance, issues relating to curriculum and assessment were traced back from the technikon era with regard to the kind of knowledge that was focused on through the curriculum and policies that were followed. The meaning was captured through interviewing lecturers who had the experience of working in HE during the technikon era and during the time when technikons were transformed into UoTs. The researcher further studied the phenomena of theory and practice through which different knowledge types are communicated by means of the curriculum and assessment, to make sense of how students are developed by doing analyses, and providing interpretations in terms of the meaning participants brought to them.

Social factors like beliefs, culture or history, and social actors' interpretation of their lived experience (Maxwell, 2012; Guest, Namey & Mitchell, 2013) were recognised as points of departure on how participants gave meaning to curriculum design and assessment, and contributed in the generation of rich and relevant data. Qualitative data

were also collected by the researcher in a real life classroom where the researcher could observe, hear and see how curriculum is communicated, and how students are involved through assessment tools that were used by the lecturer to assess their understanding. This was a typical real social setting, that allowed the researcher to interpret the meaning of what real social actors (Denzin & Lincoln, 2011) reported to her based on what she could hear and see, using an observation schedule. In gathering rich data, the researcher focused on how participants experience and describe their subjective, individual points of view (Merriam & Tisdell, 2016; Creswell, 2013).

The outcome of this research study was not the generalisation of results, but a deeper understanding of experiences and perspectives of the participants selected for this study. The researcher sat in a classroom to listen to how students discuss certain topics in the syllabus and to discover how assessment strategies used allow them to discuss and debate issues and relate what they learn to their real world. This study involved universities of technology (UoTs) as sites where the issue of curriculum and assessment and how knowledge makes an impact on students located the investigation.

Before data for the main study were collected, a pilot study was undertaken using an interview schedule with four lecturers from one of the UoTs, firstly to confirm the credibility of the instrument by administering it to a small group, secondly to fine-tune the instrument before using it on the targeted population, and finally to check the kind of data that could be obtained to confirm the results. Furthermore, participants interviewed in the main study included fourteen lecturers inclusive of HoDs from three different UoTs. In this regard, consent was sought whilst anonymity and confidentiality were guaranteed.

4.3.1.3 Research type/strategy

Since qualitative research is important in education and behavioural sciences, and the investigation sought to obtain rich data and views of participants, qualitative investigation was followed because it deals with qualitative data and it aims at discovering underlying motives or desires, using in-depth interviews for that purpose. As a result, lecturers' and students' behaviour during interviews and the classroom observation were observed and analysed to reveal the rationale on how the kind of knowledge found in the curriculum and modes of assessment used, enables student

development. Furthermore, the research approach in line with the social realist stance, which recognises the segmented knowledge about reality of knowers where knowledge originates and how its connection to the formal knowledge encountered driven through curriculum and assessment, enables students' further development. Thus, use was made of the following research approaches, classroom observation and open-ended questionnaires to find answers to the objective of the study.

4.3.1.3.1 Classroom observation

Classroom observation is another means of giving the researcher more power and authority regarding data collection. Anchored on the social realist theory that acknowledges the link between different forms, the researcher was able to watch the behaviour of those under study in their natural setting and to see how curriculum and assessment influenced their development. Such a research approach enables the researcher to see things independently without being told about them, and benefits the researcher greatly in terms of interpreting any observations that are relevant to the research questions (Creswell, 2013). In this study, a classroom observation was conducted in an Art and Design class using an observation schedule focusing on three criteria, namely engagement, reasoning and use of scientific resources where students critically discussed briefs as an assessment tool and reflected on their experiences through debates, discussions and critiques. It was used to understand the extent to which the curriculum design and assessment modes used link knowledge of students to that of the content to develop optimise their thinking abilities.

4.3.1.3.2 Questionnaires

The researcher took time in designing the self-administered open-ended questions to gather qualitative data from the students with regard to their experiences in dealing with curriculum and assessment matters. Since first-year students were new in HE and assumed to have little experience with the object of study, they were not selected. Questions were distributed to students from the second-year level of study to the B Tech levels to investigate how they are affected by curriculum and assessment. Eight questions were included, followed by blank spaces to allow the participants to motivate

their responses freely and to provide additional information without the interviewer's intervention. The aim of using this approach was to obtain an understanding of whether content presented in the curriculum and modes of assessment impact on student development.

4.3.1.3.3 Multiple case studies

Exploring some differences and similarities of statements or views shared by other participants was done through multiple case studies. It is asserted by Creswell (2013) that case studies are components of data collection that are not confined to sampling techniques and are used by the researcher to obtain a broader understanding of a problem from a relatively small number that represents other individuals. For in-depth understanding of the subject under study, the researcher elicited data from multiple case studies and also by taking more time to interact with HoDs who have more experience and were conversant with the phenomenon under study, including a few lecturers' examples that revealed engaging ways to convey curriculum and assess students. The selected scenarios provided insight and a broader picture about aspects of the role of a university, curriculum reforms, teaching and learning pathways and the modes of assessment used, and their impact on students learning.

> But university is more than just a self-improvement camp. Participants were able to articulate the specific knowledge and ways of thinking that they had developed while at university, and how these skills put them in a strong position in trying to enter what is now termed the 'knowledge economy'. Importantly, these are not just instrumentalist technical 'skills' but ways of thinking – which means that the impact goes beyond the individual. Many students spoke in some detail about the kind of creative and analytical thinking that they had learnt at university: not taking things at face value, being able to interrogate different ways of conceptualising a phenomenon, how to build up or test a logical argument (Frick, 2018: 134).

The above case emphasises the view that universities provide specialised knowledge that develops students' intellectual abilities.

> Students who were given a research project over three months to assess the impact and feasibility of nuclear or coal usage for Eskom generation of electricity which required

> extensive reading of theory and application. As reported, students read and studied extensively before going to the site to observe and validate the theoretical content they were exposed to as well as asking questions of those who have the experience of working with electricity and tested their work on a small scale. Assessment was based on students' knowledge of theory and its application to solve complex problems, such as sustainability of power generation plants and whether Eskom is fit for purpose in providing electricity to communities.

Besides exposing students to industries and the technological expertise being used, the above case highlights the relation between universities and other communities of practice as well as demonstrating the link between theory and practice. This further illuminate regional benefits of UoTs in making theory applicable to social spaces of social actors where problems are encountered.

> The dual relation between knowing and knowledge through UoTs' interaction with society and students applying theories they have learned was also shown in the case of practical projects run by PPC cement which required students to design products that attracted clients, as well as showcasing their skills. As reported, the practical sessions lasted for a month and were taken as practical sessions whereby companies are mostly interested in observing and finding out how innovative students can be. During these competitions, students use cement to design public art and companies assess students and challenge them to come with innovative projects which are market friendly and impact positively on the society. After the completion of practical sessions with external stakeholders, the projects are further debated in class in the form of reflection exercises whereby the lecturer also allocates marks based on students' different abilities to explain the theory they have applied and logical reasoning that culminated in the design of their different projects or products.

The above case elucidates beliefs and assumptions of the social realists in highlighting the value of scientific knowledge not to be acquired for itself, but to be used to develop students' intellectual abilities and skills so that they become innovative and use knowledge to solve problems in their contextual spaces. Similarities and differences in their history and modus operandi of technikons and UoTs are further highlighted by individuals who used to work in industries and started their lecturing career during the technikon era.

> Technikons were more practically oriented, and prepared students for the industry, either to work as technicians, electricians or to work on stage. Whether students understood or knew what they were taught was not important, what was important was how they could demonstrate or produce something. Notably, working in industries was more important. Further reflected was that most graduates used to learn more skills on the job. On the other hand, industries used to recognise the expertise of individuals who were hired in industries on the basis of their talents and skills. One of the USA's top achievers, Steven Spielberg, Oscar awards winner , and also the director of 7de Laan, is an example of an individual who learned special skills on the job through exposure to the industrial world.

Similar to the above scenario, more information was also shared about curriculum and how programmes in different Art departments of four different erstwhile technikons were outlined.

> Different programmes under Art focus on identifying skills needed in creative industries. Prior to curriculum reforms, universities of technology, namely CUT, TUT and CPUT relied on the convenor university of technology VUT for curriculum design and each university specialised and developed specific skills with specialisation in children's clothes, men's clothes, wedding clothes and gowns. Although the convenor system made migration easy for technikons offering the same programme, creativity was not stimulated because the content of the syllabus was uniform. Theory informs practice and the two are inseparable, but they had been treated as two separate aspects. Previously, theory was taught before going to the labs to be assessed and to sharpen skills. Currently with the review of programmes there is an interface, in attempting to balance theory and practice with a five-tier diploma which articulates towards a Master's degree. However, the belief is that M. Tech should have been kept as it is because it maintains a balance between theory and practice. In that regard, an example was given of international universities that operate differently namely: Quinella University in Australia which has two doctoral degrees in Art (PhD and DCT) and whereby one degree has a more theoretical base, and the other degree concentrates on the product design to allow students to specialise in what they are good at, because Art as a field of study, is essentially about feeling and form.

The above case scenario reflects on how changes in the curriculum were made, and also suggest that probably a broader engagement with lecturers as stakeholders prior to curriculum was not done adequately. The following case provides information with regard to changes relating to curriculum reforms that impacted on practice.

In Electrical Engineering, disciplinary knowledge is more important to prepare students to think analytically and design frameworks, and students are introduced first to principles. Curriculum is well sequenced and taps into disciplines such as Physics, Mathematics and Science. Theory assists students to do well in practice and this is evident in benchmarking and collaborations whereby students share their knowledge with other students internationally whose infrastructure is very good and supports their learning needs in comparison to small labs which accommodate many students. Also reported was that experiential training, which has been the strongest link in technikons and UoTs to provide a hands-on approach and focus on manufacturing and building, is currently working differently. The indication was that with the current programme review and the economic and financial state of many industries, students are currently compelled to do practise in the labs independently for a year followed by an application for internships.

This next case shows that besides theory and practice, students are also developed differently to incorporated ethics and values that are expected from graduates.

Students are assessed on their engagement with communities which involves different ways of interacting with communities. Amongst programmes or projects students plan is how they show creativity in portraying some sensitive events, and also how they respect humanity and considering people's feelings is one of the priority measures that is examined. During reflections sessions in class, students highlight the plight of poor people. Some of the events that students plan and engage in with communities include activities or celebrations of important events such as celebration of Africa, and they are done to feed into the theme of social justice aspects and to highlight the common identity and strengths of other groups, and to critique the violations of human rights and dignity of other human beings. In certain instances, satire or dry humour will be used to highlight some of the disturbing social inequities and discriminations in the form of drama, poetry.

The case below show how students engage with communities and share their knowledge and skills.

In the Radiography module, patient care and management are also given to students as case studies with the purpose of reflecting on social issues and drawing comparisons between rural and urban areas and to think of ways on how some of the social challenges can be improved. Graphic Design by its nature has social underpinnings; the designs of posters created by students are done to impact on the community and to creatively portray and emphasise the rights and the dangers faced by communities on aspects such as HIV/AIDS, cancer, women abuse etc. Assessment follows critical debates and engagement with society and is done for students to recognise and respect the dignity and

> the rights of people as outlined in the Constitution of South Africa and to empower communities with knowledge pertinent to solving some their social problems (P 7/Graph).

Another case was of an ongoing collaboration between CUT students and German students, in which third-year students from the two universities demonstrate how internalisation and scientific knowledge move beyond borders. The case involved fifty-four third-year Electrical Engineering students and their German counterparts.

> The two groups of students from CUT, South Africa and those from a German university start planning similar project by examining the living circumstances of people around them and how they can change their conditions. Both groups of students then start working on temperature control using Matlab software. The two groups share information how the project is to be approached and then give each other timeframes to report progress. The first presentation which gives an outline of what the two groups have planned is done at the end of each quarter and towards the end of the first semester the two groups make presentations of the final product and make comparisons. All the sessions are done through Skype and the lecturers observe and allocate marks for steps taken towards producing the final product. What emerged from the comparisons of the projects during the final presentations was that CUT students were found to be good at explaining the theory aspects and the steps they had taken, however the product produced by their German counterparts was far better due to the advanced facilities they have.

From the multiple case studies emanating from different institutions, some similarities within the three institutions became evident and they corroborated the data collected from interviews with other lecturers. The revelation was that conceptual knowledge is key in enabling practice and that universities are spaces to develop students' thinking abilities and to prepare them for the future and to solve complex problems. Also evident is the idea that UoTs have similar philosophies of learning like WIL and that knowledge is applied to solve real problems.

4.3.2 Methods

Methodology is defined as a plan of action or a design on how the research process will unfold, depending on the choice of methods or techniques used to gather and to analyse data (Dawson, 2009). It would not be possible to obtain qualitative data through a positivist paradigm. In this study, an interpretivist paradigm was chosen because the

researcher relied on data shared by participants and then interpreted; a positivist paradigm was therefore not used, and neither was the realist theory. In the main, interviews, in conjunction with classroom observations, narratives from students' questions and document analysis, presented the researcher with rich qualitative data. Participants' values are also considered in a qualitative paradigm, as data are not analysed in a value-free manner (Dawson, 2009; De Vos, Strydom, Fouche & Delport, 2011; Patton, 2015).

4.3.2.1 Sampling population and selection of participants

Sampling or selection of participants in the context of the qualitative research represents a small group of individuals from the population from whom data are obtained. They were selected to contribute towards an in-depth understanding of the phenomenon under study (Creswell, 2014; Patton, 2015; Merriam & Tisdell, 2016)). Since what the study investigates is a social issue that confronts, the involvement of participants who are social agents as the point of departure, showing a relational process and recognition of the origin of knowledge within the social capital where it is constructed, was relevant and meaningful. Selection of participants in their social domain also shares a common element of the social domain of knowledge with the chosen theoretical framework, which gave weight to the richness and authenticity of the data collected. Participants were selected purposefully from a university context, to represent the population from which the data were obtained because it was impossible to study the whole population (Dawson, 2009).

Since a large population could not be used, a small purposive sample was used and therefore also not a positivist paradigm which requires a large sample (Bless, Higson-Smith & Sithole, 2013). It was not possible to cover all six UoTs because of lack of resources, time constraints and communication challenges. However, since they all have common features of being career-focused and applying knowledge to solve real problems, the three UoTs representing the whole population were: the Central University of Technology, the Tshwane University of Technology and the Vaal University of Technology. Since the aim for the selection was to obtain rich data about participants' views and experiences about the curriculum and assessment, selection of this representative sample was consciously done. It included senior students and

lecturers in different fields of study and HoDs who have been with the university for a long period and who had also been exposed to the subject under study.

In this study, the size of the population selected was small, consisting of fourteen staff members including heads of department. Most of staff were originally from industries. Eleven of the fourteen were lecturers in different faculties of the three universities of technology, in the faculties of Humanities, Engineering, Management Sciences, and Health and Environmental Studies. Most of them had many years of experience with curriculum and ways of assessing students, and amongst them were technikon products. Some of them had been in the industry before joining HE. The population was also represented by thirteen students in their second to fourth year of study, all of whom had been exposed to, and impacted upon by, the curriculum design and assessment strategy used in their various programmes. In the pilot study, the sample consisted of four lecturers who were selected from one university to test the correctness of the research questions.

4.3.2.2 The sample size of participants selected

Since there are no rules stipulating the number of participants in a qualitative inquiry, the sample/selection of participants in this instance was limited to a few selected cases, which impacted on the replication of results in contrast to quantitative studies which use random probability sampling which does not place a limit on the sample size (Awang & Noryatnti Muhammad, 2012). Due to challenges that were encountered such as time constraints, breakdowns in communication, not getting hold of the right personnel tasked with research protocols in other universities, not getting responses to e-mails, and some lecturers who did not answer follow-up e-mails, only fourteen staff members and thirteen students who agreed to be interviewed were selected whilst some of the participants who initially agreed to be interviewed did not honour scheduled appointments in other UoTs. As a result, the number of UoTs selected was reduced to three.

4.3.2.3 The process taken for selection of participants

The sampling process refers to how the sample is gathered and what exactly is to be gathered in relation to the study. This study employed purposive sampling. As the name indicates, participants were chosen on the basis of the purpose they served in getting the relevant data. Forms were completed to follow protocols of the different UoTs, and documents required attached, including the ethical clearance protocol and the title of the thesis. Requests were made for office contact details and e-mail addresses of respective HoDs and lecturers to be interviewed; however these requests were met with little success from other institutions. From contact details that were found, appointments were then scheduled with those who agreed to be interviewed. Students were organised and issued with questionnaires by the researcher.

4.3.2.4 Data collection instruments

In line with the chosen interpretive paradigm, the research design for the main study was descriptive and interpretive (Henning, Van Rensburg & Smit, 2011). The researcher collected data from participants by using research questions administered mainly through interviews which were recorded, and document analysis was done to provide in-depth information. Apart from interviews, official documents, policies, and test papers were investigated and analysed to strengthen the weight of evidence obtained from interviews.

4.3.2.4.1 Interviews

Interviews as interactive tools were used to bring the researcher closer to those who are executing curriculum and assessment to explore assumptions they have on the issue under discussion. The subject matter being a social issue also warranted social interaction with those who are impacted by it in their social context, to hear their experience and see their reactions about the object of study. More than other instruments, interviews illuminated a synergy with the alternative sociological lens which recognises social actors as constructors of knowledge which needs to be improved with scientific knowledge features. Furthermore, an interview has the advantage of creating a harmonious relationship and a meaningful two-way

communication between participants and the researcher. According to Silverman (2013), interviews as a tool for gathering data allow for a meaningful engagement and a free flow of ideas. Interviews were therefore the main tool that the researcher used, which enabled the problem to be examined within the social space where the problem arose. Using participants' own words, their experiences, opinions and beliefs on how they experience reality, in the form of a one-on-one conversation with the researcher, provided clear, real evidence about issues of curriculum and assessment with which lecturers and students are confronted.

Although interviews are guided by research questions used in conjunction with the interview schedule, this does not limit probing and clarification of questions. The advantage of this is that it gives participants the opportunity to clarify answers as well as allowing the researcher to make follow-ups on interesting answers (Silverman, 2013). In the process of conducting interviews, this study used a scheduled 20 to 40-minute semi-structured interview, although in some cases it took 50-60 minutes, consisting of pre-planned questions. The aim was to gather data from lecturers and subject heads who were conversant with the issue. They were interviewed in the hope of eliciting rich data with solid evidence (Rubin & Rubin, 2012; Creswell, 2014). The researcher gathered and recorded the information and made written notes by herself which enabled a better understanding of the data.

In the main study, face-to-face interviews with lecturers in the three different UoTs were conducted to get rich data and personal views about curriculum design and assessment in their fields of study, using a research interview schedule. For students, one classroom observation session was conducted, and semi-structured questions which needed some motivation were distributed to thirteen senior students. Students and staff used in this study contributed rich, first-hand information about the phenomenon under investigation (Guest et al., 2013). Tests, as part of the assessment strategies, were also examined and returned to respective lecturers. The aim was to find out about the type of questions being asked and the type of knowledge that is being promoted, from which data meaning and truth could be deduced (Guest et al., 2013; Creswell, 2013).

Although sources of data, such as the literature review and documents analysed, were used in this study, the researcher relied more on participants' views. The researcher interviewed the participants and listened to their views, interpreting meaning based on

their experiences by recording and transcribing data while at the same time observing their interaction and involvement with the phenomenon under study. Participants who could not be reached were interviewed via media devices such as Skype and Imo cellphone video calling. Working with a small sample of people in the convenience of their office created a free environment, conducive to the open expression of their thoughts and feelings. The researcher allowed them to express their views freely regarding the phenomenon under investigation.

Participants, whose consent was sought, were assured of anonymity and confidentiality. Although there is an advantage in getting to know the context better and developing relationships with people, it was a marvel to experience the convenient use of technology and cost savings provided by the use of media, in comparison with a car trip undertaken to conduct interviews. Technology also showed its own flaws, however, as it took a while to connect to participants, due to wi-fi connection challenges.

An interview is a communication method of engagement aiming at a free flow of ideas and a gathering of information, with the researcher taking field notes (Rubin & Rubin, 2012; Creswell, 2014). It is an important tool because it allows participants to share, in their own words, their experiences, opinions and beliefs on how they experience reality. As a result, interviews conducted followed a one-on-one conversation model with the researcher, allowing her to probe, and participants to clarify answers. A scheduled 20 to 40-minute semi-structured interview was used, based on pre-planned questions. Semi-structured questions were distributed to students from second-year to B Tech levels, to investigate how they are affected by curriculum and assessment, and a classroom observation session concentrating on three categories was conducted in the Department of Art to investigate briefs that involved reflection on the part of students. This also demonstrated how students engaged with and supported their arguments during the activity.

One-on-one interviews with the participants were useful in allowing the researcher to capture every detail of the conversation, including gestures and the tone of participants' voices, which projected how they felt about the object of study. They were encouraged by means of eye contact to communicate freely. Furthermore, use was made of sub-questions to elicit information from participants by asking them to give their opinions on the questions asked, or to add further information to the response. Probing was used

to encourage participants to elaborate on their answers. This included prompting as well as summarising. The researcher used phrases such as "Could you elaborate more on that point?" and responses were reported verbatim. The researcher as the main data collector was careful not to allow her bias or values to affect the study.

Participants' voices, which echoed throughout the research, were represented verbatim, using quotations, words, concepts and phrases. At the same time, the researcher was also immersed in the construction of data which emerged in different themes and which were categorised accordingly. According to Silverman (2013), an interview is a communication of engagement with the aim of gathering information. Interviews were therefore planned carefully to elicit the type of responses needed to address the research question. The interviews included students, lecturers and subject heads. Before participants could be interviewed, permission to conduct the interviews was sought.

The research interviews took the form of direct interaction and face-to-face encounters between participants and the researcher. The interview guide used consisted of main and subsidiary research questions. The researcher wanted to obtain specific information that could be compared with information gained in other interviews. To solicit more information from the experiences and perception of lecturers and students about the phenomenon under investigation, the researcher used semi-structured and in-depth interviews (Dawson, 2009). Open-ended questions were also used during the interview to elicit discursive and detailed responses because they have an advantage of allowing the respondent to clarify unclear answers and allow for a follow-up on interesting answers (Goddard & Melville, 2001). Besides ensuring the active involvement of participants, the researcher was immersed in the research and actively engaged with participants to interpret the information obtained (Patton, 2015).

Data were gathered in relation to assessment, knowledge differentiation and the issue of social justice. It was collected by using semi-structured, focused interviews and open-ended questions with selected individuals. To this effect, subject heads, lecturers and students with knowledge and experience relating to the topic of interest were interviewed with the purpose of producing credible results with solid evidence. Other than that, participants' experiences were shared by encouraging a free flow of ideas. Participants were interviewed for at least 30-40 minutes using open-ended questions and probing to get the best responses (Rubin & Rubin, 2012). To ensure the credibility

of the information, the researcher recorded it and made written notes. The data collected were reported exactly as said by participants and the researcher as the main data collector was careful of not allowing her own bias or values to affect the study (Creswell, 2014).

Upon completion of the interviews, the researcher transcribed the data manually, comparing the transcript with the recordings, replaying the recording tape and those that were collected via Skype, face-to-face, Imo-video and cellphone interviews. Quotes, phrases, statements and words presenting data were categorised and constructed into themes. The first step was to label all the raw data. Common patterns of words and phrases were then combined under one category and turned into themes. At the same time, themes were summarised into statements to see whether the findings corroborated and integrated with the research questions and what was investigated. This study was thus guided by an interpretive paradigm which allowed the researcher to derive meaning from emerging themes (Dawson, 2009). Participants were also asked to verify whether the data transcribed were a true reflection of what they had presented. Qualitative research does not test a hypothesis to eliminate bias but uses rational objectivity or logic to arrive at the findings. The researcher employed both inductive and deductive data analysis to analyse participants' responses to research questions used in the interview schedule.

For those who could not physically be reached, arrangements were made at the researcher's institution in the centre for e-learning to connect to their institutions using Skype. During the visual video calling interview, an audio tape recorder was used, and notes were transcribed to capture the information. The connection was bad for one of the participants, so that interview had to be rescheduled. An alternative cellphone video calling method known as Imo was then used, still using an audio tape recorder and transcribing notes. In both cases, the interview took more than the scheduled time due to minor connection issues. It is worth mentioning that working with a small sample of people in the convenience of their own offices created a free environment, conducive to the expression of the thoughts and feelings of the participants, while it also allowed them to discuss their views freely about the phenomenon under investigation so that rich data were obtained. In all cases, the experience created an opportunity for the researcher to get rich and in-depth information.

At the same time, driving from one province to another was accompanied by disappointments and frustration because of participants who could not honour their appointments. However, those who did honour their appointments requested other colleagues to assist, and these participated voluntarily after being assured of confidentiality and other ethical considerations.

Despite its convenience, technology as one of the niche areas of UoTs had its own flaws. It took a while to connect to one of the participants due to network challenges. With the other participant, the interview had to be paused from time to time, also due to poor connectivity.

i. Interview procedures of the main study

Telephonic and e-mail arrangements were made with participants selected for the study to schedule a time suitable for the interview. The researcher informed the participants of the purpose of the study and established good relationships with them. Interviews were conducted in a cordial atmosphere, which was ideal for both the interviewer and the interviewee. At the beginning of the interview an explanation was given to participants about the aim of the investigation, and ethical issues such as confidentiality and the recording of the conversation were discussed.

Before the research interviews could be conducted for the main study, e-mails were sent to the respective institutions seeking permission to conduct the study. This process was largely characterised by poor communication and lengthy protocols: in one case the researcher was, strangely enough, required to submit her research proposal even though it was not registered in that institution. That institution also required the interview schedule, an ethical confirmation from the researcher's institution and a letter from the supervisor. Further arrangements were made to obtain the cellphone numbers of those who had volunteered to be interviewed, and trips were undertaken to conduct the interviews.

ii. Recording the interview procedure

During the interview, data were recorded on audiotape and field notes were taken simultaneously to enrich the taped discussions. The researcher first reassured participants that everything would be kept confidential and anonymous. Permission to use the tape recorder was requested before the interview, and participants consented to its use. The tape recorder was placed between the researcher and the participants in such

a way as to capture the entire session. Using the tape recorder enabled the researcher to maintain eye contact with the participants and back up the information that the participant provided.

iii. Note taking during the interview

Participants were informed that notes would be taken during the interview with the aim of backing up the audio recorded conversation. However, the exercise was done discreetly without distracting from the interview process.

iv. Advantages of using an interview

The researcher was sitting face-to face with individual participants, and they were both unencumbered. Dialogue was created in a warm and friendly manner and clarity on questions that were not sufficiently clear was obtained instantly. Participants asked questions where they did not understand, and the researcher was also able to probe and provide clarity. Non-verbal communication that can impede the collection of data was observed and the participant was made to feel relaxed or the question was rephrased. The use of an interview with a planned schedule also assisted in preventing researcher bias and ensured that the process was approached without preconceived ideas.

4.3.2.4.2 Pilot interviews

A pilot interview was carried out prior to the commencement of the actual research. The aim was to establish the clarity of the research questions and to rephrase some of the sub-questions that were not clear enough, to guard against repeating questions and the incorrect wording of the questions, as well as to check data feedback that was produced (Cohen, Manion & Morrison, 2011). This process allowed the interviewee to rephrase questions that were not clear enough, while also identifying any questions that might make a participant feel uncomfortable.

4.3.3 Research type/strategy

4.3.3.1 Multiple case studies

From the multiple case studies emanating from different institutions, some similarities within the three institution became evident and were corroborated by the data collected

from interviews with other lecturers. The revelation was that conceptual knowledge is key in enabling practice and that universities are spaces to develop students' thinking abilities, to prepare them for the future and to solve complex problems. Also evident is the idea that UoTs have similar philosophies of learning such as WIL, and that knowledge is applied to solve real problems.

4.3.3.2 Classroom observation

Classroom observation is another means of giving the researcher more power and authority regarding data collection. The researcher was able to watch the behaviour of those under study in their natural setting and to see how curriculum and assessment influenced their development. Such a research approach enabled the researcher to see things independently without being told about them, which benefitted the researcher greatly in terms of interpreting any observations that were relevant to the research questions (Creswell, 2013). In this study, a classroom observation session was conducted in an Art and Design class, using an observation schedule focusing on three criteria, namely engagement, reasoning and use of scientific resources where students critically discussed briefs as an assessment tool and reflected on their experiences through debates, discussions and critiques. This was used to understand the extent to which curriculum design and assessment modes used link knowledge of students with content to optimise their thinking abilities.

4.3.3.3 Open-ended questionnaires

Self-administered open questions were designed to gather qualitative data from students' experiences and their relevant views about the curriculum and assessment strategies. A questionnaire was provided consisting of eight questions which were followed by blank spaces for writing, allowing students to motivate their views freely and to provide detail and additional information without the interviewer's intervention. However, the fact that students answered the questions independently, without the interviewer's intervention to probe or rephrase questions, may have meant that some of the respondents perhaps did not understand the question properly, and also meant that they did not always give reasons for their choice of answers.

4.3.3.4 Classroom observation

The nature of existence refers to existence as examined through the human senses. A classroom observation session is a way of giving the researcher more power and authority on data collection because she can listen to students' discussions on aspects relating to curriculum, gaining a sense of their perceptions and understanding in the classroom setting, and enabling the researcher to see, listen, feel and interpret meaning independently, without being told about them; this benefitted the researcher greatly in terms of interpreting any observations relevant to the research questions (Creswell, 2013). As a result, she was able to interpret matters relevant to the research question by means of what she heard, felt, saw, learned and interpreted (Creswell 2013).

Such activities involve active discussions or reflection about a topic, for instance in an art class. A classroom observation session was thus conducted in the Art and Design class using an observation schedule focusing on three criteria, namely engagement, reasoning and use of scientific resources. Students critically discussed briefs and reflected on their experiences through debates, discussions and critiques. The researcher observed the way the lecturer conducted briefs, and also the way students reflected critically on the lesson as an assessment strategy, and how they engaged and expressed their thoughts. The researcher used field notes, concentrating on three categories. Firstly, she checked the level of engagement of students, how they critiqued each other and how they backed their views by referring to the text and theory they had learned in their module. Secondly, she observed how the students presented their arguments by using scientific sources to support arguments. Lastly, she also observed how students used scientific resources to reinforce their stances, while recording her observations in writing.

The table below shows the types of involvement of the participants.

Table 4.1: Participants' involvement

Participants	**Type of involvement**
Lecturers	Individual face-to-face interviews and Skype
HoDs & Acting HoD	Individual face-to-face
Students	Completed a questionnaire and subjected to classroom observation

4.3.4 Data analysis

Data analysis occurs simultaneously with data collection or may follow immediately after data collection to consolidate all that has been gathered into a meaningful piece of information. According to Merriam and Tisdell (2016), data analysis is a systematic way of making sense through interpretation of what participants have said, and coding it into themes (Harding, 2018). It also allows the researcher to see patterns, identify themes, discover relationships, evaluate the results, make interpretations, or construct theories. Furthermore, it involves the processing of raw qualitative data so that what has been learned can be communicated and shared with others (Merriam & Tisdell, 2016). Thus, during the process of interviews, data collection and data analysis stages, the researcher made efforts to analyse the data based on statements and words used by participants in order to avoid all possible preconceptions regarding the phenomenon under investigation. Furthermore, in analysing the data, the researcher described the original source for confirmation of credibility by comprehending and synthesising data obtained from participants to obtain meaning.

The researcher first examined the entire spectrum of data at her disposal, using transcribed notes and the tape recorder to verify the statements. When the time came to draw upon the interviews for her research report, the researcher ensured that she was finding answers on the role of curriculum and assessment in the development of students' skills and intellectual abilities. This was done by building an engaging narrative and including it in the appendix (see Appendix 1). Interviews were time-consuming but were the researcher's main data-gathering method. As a result, responses obtained during the interviews were transcribed verbatim and read again to understand them. The data analysis from the interviews involved transcribing information from the tape recorder and from the personal notes made, then coding and grouping together words, ideas and statements that were alike, and labelling them in order of their importance.

Statements were then reconstructed once again to make more sense out of them by searching for common concepts and rearranging them systematically and categorising them into themes to make sense of the meaning behind participants' words and statements. The rearranged themes made it possible for the researcher to compare and contrast patterns. This was all done by the researcher herself. This coding process

enabled the researcher to reflect deeply on the data, such that no valuable information was lost or interpreted differently, as might have been the case if software was used for coding. The researcher thus acquired knowledge and data by deriving conclusions from information at her disposal in an organised manner. Notably, the researcher was compelled to switch and move beyond experiences into the abstract to analyse, synthesise and make sense out of data gathered about the phenomenon under investigation and then draw conclusions.

Following Saldana's (2016) theory of *in vivo* coding themes, categories and themes were derived from participants' words with the aim of maintaining their voice. The researcher as the bearer of information also constructed and interpreted themes from data, through literature from previous research, and by observing in a classroom how some of the assessment strategies were conducted with the aim of interpreting meaning. The researcher followed a complex process of both inductive and deductive reasoning in terms of which themes were created and then organised into abstract concepts by working back and forth through them and checking on whether they corresponded with the data collected (Creswell, 2013).

The same inductive approach was further used in condensing raw data that emerged from literature and policy documents in categorising it into themes. Themes gradually emerged through careful consideration of the data, making deductions in line with the interview questions, and considering what was gathered during the initial review of the literature and extracting important concepts. At successive stages, themes advanced from a low level of abstraction to become major, overarching themes embedded in the solid evidence provided by the data. Themes that emerged provided a full description of the meaning behind what was investigated. Out of the themes that emerged, trends and patterns were also derived. Although some themes appeared many times, their number did not have any statistical significance; they did however become the major findings of this study. The researcher arrived at the findings by using thematic analysis as defined by Creswell (2007), by aggregating information into categories and providing a detailed narrative.

Furthermore, the researcher distributed a simple self-administered questionnaire with open-ended questions to senior students. The questionnaire consisted of main statements where students had to tick the appropriate answer or response and give a

motivation for their choice. Students' responses to the questionnaire were analysed by using percentages to measure the dominant aspects emerging from the study. A class observation session was also conducted only with students who were enrolled for the Art and Design programme. This was done after interviewing their lecturers, who pointed out the benefit of using reflection to make students discuss issues and improve their thinking capabilities.

4.3.5 Document analysis

The same an inductive approach was further used in condensing raw data that emerged from literature and policy documents in categorising it into themes with the aim of gaining further insight into what is being investigated (Creswell, 2009). Documents that were analysed included public records such as policy documents, curriculum materials and tests. Most of these documents were analysed in order to provide information on the existing gaps relating to curriculum design and assessment.

4.3.5.1 Policies and documents

Documents consulted included policy documents and curriculum materials in general, as well as assessment policies. The researcher investigated various policies and curriculum documents, including test papers. Documents were used to investigate the extent to which curriculum design and assessment are factored in towards developing students and preparing them for the 21st century, and to deal with issues of social justice, whilst test papers were examined to check how assessment is used. The literature review that was undertaken for this study (Chapter 2) contributed meaningfully by shedding light on theoretical perspectives, and assisted in elucidating the way that other researchers have tackled the issue of knowledge in the curriculum and how modes of assessment used promoted learning. Literature was accessed through journal articles, books and online documents.

4.3.6 Dealing with data

The authenticity or confirmability of data is based on trustworthiness and its accompanying characteristics such as credibility, transferability, dependability and conformability (Creswell, 2009). For this study information obtained from interviews, self-administered, semi-structured and a classroom observation session were confirmed by the literature reviewed and policies that were investigated to check for similar categories and concepts that were ultimately developed into themes.

4.3.6.1 Member checking

Member checking is key and equivalent to validity in positivist research. This activity is done with the aim of ensuring the credibility of the investigation (Lincoln & Guba, 1985). It is also done to confirm the credibility of the instruments such as the interviews, observations, and self-administered questionnaire. In ensuring the credibility of data, collected notes were shown to participants to check whether anything was perhaps missed and whether their words were recorded accurately. The researcher's summary and paraphrasing were also checked by a colleague against the audio tape recording clip. This was carried out during both data collection and analysis. In addition, the supervisor read through the work critically and checked whether the analysis and the interpretation of results were done accordingly, as well as checking whether the methodology followed correlated with the instruments and literature selected. After corrections were done, the work was taken to the editor who is also a senior researcher, to check the alignment of the methodology, edit the work and give feedback.

4.3.6.2 Peer debriefing

Peer review implies requesting some colleagues who are competent in qualitative research procedures to listen to the recordings as well, or read the transcribed data by re-analysing the raw data, listening and discussing with the researcher some of the concerns that have been picked up or raised (Lincoln & Guba, 1985). The peer should have some expertise in research in order to be able to question the approach and instruments used, but should not be directly involved in the research project (Guba & Lincoln, 1994). Peer debriefing is recommended as a continuous process to be done

throughout the research process. Before this study was submitted to the supervisor, the researcher asked a peer to read through and discuss the methodology chapter which explained the data analysis and interpretation. After the peer had read the chapter and made her recommendations, the chapter was then sent to the supervisor for review. The researcher also participated in the South African Association of Education (SASE) 2016 conference held in Botswana from 4-6 October to present and share preliminary findings on one of the research questions – on reflection as an assessment strategy – to get feedback from peers.

4.3.5 Measures of trustworthiness

4.3.5.1 Trustworthiness of the study

In qualitative studies researchers follow an interpretive paradigm which uses small, non-random sampling and criteria such as trustworthiness/credibility, transferability, dependability and confirmability to ensure accuracy of the information gathered (Denzin & Lincoln, 1985). Trustworthiness is equivalent to internal validity which ensures objectivity in a quantitative study. Trustworthiness implies a demonstration that the study has been conducted in a credible manner based on standardised instruments, and whether the researcher accurately represents and reflects the reality and ideas of the participants (Shenton, 2004).

Establishing categories from the raw data obtained from the interpretations of participants was one of the methods that was used in this study to contribute towards the trustworthiness of the findings. The researcher conducted a literature review to familiarise herself with the content of the phenomenon under investigation, collected data by means of individual interviews to obtain in-depth information regarding curriculum and assessment, drew information from multiple case studies, conducted a classroom observation session, distributed a self-administered questionnaire to investigate the same phenomenon, and consulted policies and documents. Through the use of different data collection methods and strategies, the researcher was able to discern true information and draw conclusions and evidence from different sources (see Bless, Higson-Smith & Sithole, 2013). Also included to ensure trustworthiness of the findings were field notes and recordings that were used as evidence to corroborate the responses of participants and to ensure accuracy and the credibility of the findings.

Trustworthiness was also ensured by deliberately setting aside any preconceived ideas about the phenomenon under investigation, and by confirming with participants whether the recordings were a true reflection of the information they had conveyed during data collection (Lincoln & Guba, 1985). Before the interview session could begin, participants were assured that confidentiality and anonymity would be fully respected in the interests of an ethically sound product, which laid a fertile ground of rapport between the researcher and participants. Further, the researcher's professionalism and the respect for values cherished by the participants created a trusting and respectful atmosphere, which helped participants to feel free to open up and share their views. The researcher listened attentively and gave the participants, as masters and specialists in their field, her complete attention so that they could articulate their views; she was also able to ask clarity-seeking questions, and to request participants to repeat any statements that were not clear, in order to obtain full understanding of the phenomenon under investigation.

Human values and professionalism that were displayed enhanced mutual trust and respect and ensured future prospects of knowledge-sharing to grow the profession. Consequently, assurance from participants of willingness to assist the researcher in terms of further information was extended and welcomed by the researcher. A relationship of trust that had been created between the researcher and participants thus allowed the researcher to be free to contact participants in cases where the researcher needed some clarity or did not understand the meaning of certain articulations which were added to the field notes.

4.3.5.2 Credibility

Credibility is like validity in a quantitative study where findings match with reality, but in this context, it refers to a level of truthfulness about the analysis of the views of the people (Lincoln & Guba, 1985). It is to be noted that credibility is not about absolute objectivity, but is established when the findings represent the views of social actors under investigation. Furthermore, credibility is about the believability and the reliability of methods used to gather and analyse data. In this study credibility was ensured when preliminary results were communicated to others on how data was collected, how sampling was done and how the results were analysed. Credibility also involved

engagement with participants; tireless observation regarding what was happening; the use of peer debriefing and peer checking; and confirming with participants the authenticity of the data described and interpreted (Lincoln & Guba, 1985). The conducting of face-to-face interviews using an interview schedule accompanied by audio-tape recordings and transcription of notes adds to credibility because these items are kept safely and can be played back to establish the correctness of data gathered.

4.3.5.3 Dependability

Dependability refers to the stability of the findings over time. It entails the use of the same collection methods and being able to repeatedly elicit the same data. Dependability can be likened to reliability in quantitative studies, and a dependable study should be accurate and consistent (Lincoln & Guba, 1985). The dependability of the data in this study was ensured through the guidance of the supervisor, who scrutinised the interview schedule in view of what the study sought to achieve, and to ascertain the usability of the questions to enhance dependability (Lincoln & Guba, 1985). The supervisor of the research audited the research project and examined the data and the relevant supporting documents.

4.3.5.4 Confirmability

Confirmability necessitates neutrality or an unbiased approach. It relates to the question of whether the findings can be confirmed by another person or whether data gathered helps to confirm the general findings (De Vos et al., 2011). Confirmability concentrates on the organisation of the data. This implies that the research findings are the result of the research process and not the researcher's presumptions and expectations, ensuring that the data is dependable. Furthermore, confirmability is the internal coherence of the data in relation to the findings, interpretations, and recommendations (Guba & Lincoln, 1994). In this regard, the supervisor also played a very important role as the mentor to confirm every step taken in the research process, from the process of collecting, to organising and interpreting the data. In the study, the researcher made use solely of participants' responses, by organising them according to different themes before arriving at conclusions. Data were analysed thematically through content analysis. Data

from interviews were coded, categorised and analysed into themes, and then presented and discussed.

The following themes emerged and were interpreted to arrive at the findings: process and practicality characterised technikons/UoTs' relationship between theory and practice; the value of outcomes; preparation for the world of work; assessment, reflection and engagement; engagement with issues of social justice and the development of higher order cognitive skills.

4.3.5.5 Transferability

Transferability refers to the findings of the research project that can be applicable to similar situations or participants (De Vos et al., 2011). This means that knowledge that was acquired in one context will be applicable in other contexts when used by another researcher using the same concepts and processes. In addition, it implies that even the same original theoretical framework can be returned to, to describe the concepts that guided data collection and analysis. For example, in writing an article the same concepts conveyed in the main study's theoretical framework could be reverted to and used.

Transferability is like generalising the results, in the sense that the same findings can be generally applied to a similar situation through the researcher's detailed description of results, purposeful sampling and methods of data collection (Lincoln & Guba, 1985). Such rich description involved a link with the paradigm, the context and participants' experiences, sampling and analysis (Creswell, 2013). The results of this study are transferrable in the terms articulated immediately above.

4.4 CHAPTER SUMMARY

This chapter provided a description of the research paradigm selected for this study. The research methods were selected to ensure the accomplishment of the purpose of the study, namely, to examine curriculum design and assessment within a differentiated system in UoTs and their effect on students' development. An interpretive design and the accompanying interpretive approaches were discussed and the reasons for their selection were outlined. Different instruments used as the main data collection

instruments, such as interviews, semi-structured questions, classroom observation and document analysis were explained, and a description was given as to how data was dealt with, bearing in mind that the purpose of a research design is to maximise the validation of answers to research questions and the propositions that have been outlined. This also included how the researcher made sense of data by using a descriptive method to analyse it and to ensure that the data was trustworthy, credible and transferable. In recognition of human values, and principles of human dignity and justice, the researcher ensured that the participants were ethically protected. All the processes and actions that were taken by the researcher in gathering qualitative data demonstrated that knowledge is gained through experience, observation, interpretation, and reasoning.

Chapter 5 will present the findings and results of the study, as derived from the collection of data from the various instruments and research strategies utilised by the researcher.

CHAPTER 5 : FINDINGS AND INTERPRETATION

5.1 INTRODUCTION

Chapter 4 described the research paradigm, qualitative design, sampling population instruments used, and the data and document analysis methods employed. Chapter 5 will report on the findings of the main study according to the themes that emerged from the data. The chapter also presents a summary of the pilot study.

5.2 SUMMARY OF THE FINDINGS OF THE PILOT STUDY

The pilot study was intended to establish the clarity of the research questions and to refine them. The findings of the pilot study suggest that the curriculum and assessment of technikons were largely based on the inculcation of technical skills, and that theory was not well linked to practice. One of the major insights was that practical skills were emphasised more at entry level, while theory was introduced once students advanced to higher levels. After technikons became UoTs, there was a shift of emphasis from practice as the main focal area towards positioning theoretical knowledge at the centre of curriculum. Curriculum and assessment were identified as being aligned to the type of skills targeted for employment but with little impact in relation to developing students to transform their surroundings. It was also highlighted that the types of curricula that were designed and the types of assessment that were used translated into graduates having similar skills and competencies.

5.3 FINDINGS AND INTERPRETATION OF THE MAIN STUDY

This chapter reports on and interprets the findings of the study emanating from the data collected from the responses to the research questions, which were arranged according to themes. This report utilises abbreviations to represent participants and other items, e.g. P for participant and an abbreviated name for the programme or field of study are used. Participants who were heads of department or acting heads of department, but who were no longer teaching subjects, are designated as P1 or P2, with abbreviated names for the subjects, programmes or fields of study of which they were in charge. For

example, heads of departments without subjects to teach are referred as P/Hed. In the case of an acting head of department, the pseudonym P/Act is used, and a coordinator of extended programmes is designated as P/CoExt. For other participants, the abbreviation P is used, followed by an abbreviation for a subject/programme/field of study. Programmes, subjects or fields of study that are covered in these findings include: Somatology (Som), Hospitality Management (Hosp), Human Resource Management (Hrm), Electrical Engineering (Engi), Logistics (Log), Industrial Radiography (Ind), Biomedical Technology (Bio), Radiography (Rad), Graphic Design and Interior Design (Graph/Int), Fashion (Fash) and Theatre Design (Thea). The research questions that guided the study also precede each theme of the findings. The findings and results are derived from themes that emanated from lecturers' interviews conducted before and during the process of programme review or re-curriculation, and from questions distributed to students and classroom observation.

A report on the findings follows below.

5.3.1 Findings of interviews

5.3.1.1 Process and practical skills characterised technikons

In what ways have past practices of technikons influenced curriculum design and assessment in UoTs?

The issue about the significance of skills (Spreen & Vally, 2010) in most of the programmes that fall under Art and Design and the development of particular skills for certain market demands is captured as follows:

> *Different Art programmes focus on identifying skills needed in creative industries. Prior to curriculum reforms, three UoTs, namely CUT, TUT and CPUT relied on one convenor university, VUT, for curriculum design, and each university specialised and developed specific skills with specialisation in children's clothes, men's clothes, wedding clothes and gowns. Although the convenor system made migration easy for technikons offering the same programme. However, creativity was not stimulated because the content of the syllabus was uniform (P1/Hed).*

Similarly, the idea about the focus on skills is also articulated by the following participant:

> *When the curriculum was designed the focus was on skills to attract jobs in industries. Knowledge and skills in industries are technically applied which requires and still presents gaps in terms of students fitting to what a specific industry requires which challenges HE to focus extensively on skills (P 2/Ind).*

The view about practices of technikons is expressed in the excerpts below:

> *Technikons used to come together and used a common curriculum; however, assessment practices were the sole responsibility of each institution. Curriculum during the technikon period was influenced by advisory committees who would make decisions in terms of the angle the curriculum should take and what was happening in the health fraternity including new technologies to be used in the laboratories. The field has a strong leg in medicine and taps into disciplines such as chemistry and physics but, concentration is more on the acquisition of skills to be applied (P3/Bio).*

The findings confirm the claim that most of the technikon programmes placed the emphasis on practical skills rather than on knowledge (see Yates & Grumet, 2011; Biesta, 2012). This assertion is confirmed in the following extract:

> *In the past the curricula focus was on vocational hands-on skills putting the weight of practice at 60% to train people for skills and theory at 40%. Specialisation was done very early, and curriculum was constructed on the basis of what students could do in the industry and most programmes were assessed in similar application of skills (P4/Hed-Rad).*

The comments below support the idea that most of the fields of study/programmes are practical in nature in developing students for the world of work and according to the needs of industries.

> *Technikons were more practically oriented, preparing students for the industry, either to work as technicians, electricians or to work on stage. Whether students understood or knew what they were taught was not important, what was important was how they could demonstrate or produce something. Hence working in industries was more important and graduates learned more skills on the job (P 5/Act-Thea).*

Participants indicated that the technikons' focus was on training students for manpower demands. The support of technikons for skilled labour, technological and applied knowledge positions is confirmed by literature (Committee of Technikon Principals, 2003). This assertion was endorsed by one of the participants as follows:

> *Curricula's emphasis in former technikons was on vocational technical aspects which were realised by performing what had been learned both in the laboratory as well as during placements in industries. The acquisition of skills and experience is still done through work integrated learning (WIL) in UoTs and practical work is still allocated more marks in comparison to the theoretical part (P 6/CoExt).*

The dominance of practice over theory in some of the programme designs, and the manner in which assessment was done is explained in the statement below:

> *The focus was on what outsiders wanted in developing students to become entrepreneurs. Promotion of skills over theory was reinforced by the type of assessment used whereby students were assessed by five lecturers instead of one lecturer who contributed [to] students following a path the lecturers wanted. Currently, the imbalance between theory and practice is slowly being eroded through changes implemented in the new offerings, to include a sound theoretical base whilst articulation and pacing follows levels of complexity (P 7/Graph).*

Similar to other views following the participant's perception, is that technikons focused on sharpening skills.

> *Our programme teaches about figures and how the human body relates to space or the environment. The programme consisted of 3 theory subjects and 9 practical subjects and more time was spent on practical subjects (P 8/Int).*

The findings revealed that through policy prescripts former technikons were practical and process-orientated. This perspective was articulated by one of the participants thus:

> *Around the year 1987 up to the early 90s, before other programmes were included in technikons, most lecturers taught and specialised in fashion, clothing, and hospitality management. Assessment then was based on tests and summative examination and it was purely theoretical. Even practical aspects were explained in theory. When students from less privileged backgrounds accessed technikons, most of them failed and changes to accommodate diversified groups were initiated in the curriculum whereby theory was allocated 60% and practice 40%. (P9/Fash).*

The idea that disciplines are considered as the foundational base of theoretical knowledge to inform practice is confirmed in the following statement:

> *Technikons favoured a practical hands-on approach of manufacturing or building things as a way of ensuring learning which continued to influence curriculum and assessment. Theory based on disciplines was drawn as the basis for knowledge, but experiential*

> *training was the strongest leg in providing a hands-on approach focus on manufacturing and building. Currently with the introduction of the new two-year diploma in Electrical Engineering, in the curriculum, the focus is equally on theory and practice, but currently students do practice which they used to do through placement in industries in the laboratories, due to the economic and financial state of industries (P10/Engi).*

In the field of Human Resource Management, on the other hand, the concentration has been and still is more on theory than on practice and it is only with the current review of the programme that practice is allocated a space in the curriculum. This is captured in the following statement:

> *In Human Resources all technikons had a similar curriculum of one-size-fits-all which was controlled by advisory bodies, without work placement in industries. The subject was more theoretically orientated without room for practice simulations of an office scenario in the classroom to capture reality as it is. But with the current review of the programme, practice is now allocated some space in the curriculum and this is to be done through WIL that has been incorporated in the curriculum design and assessment policy (P 11/Hrm).*

The findings further indicate that UoTs prepare students for the world of work by following new trends in the market or industries, and the programme aims to satisfy clients and prepare students for the world of work whilst assessment aims at demonstrating mastery of a skill. The participant's statement was captured as follows:

> *UoTs' curricula and assessment respond to market demands in sharpening skills that are needed at the workplace so that students are ready to be hired. Assessment thus puts emphasis more on the mastery of skills and the application of theory through practical activities that follow after theory has been learned to deepen knowledge. In that way theory and skills are blended together (P12/Hosp).*

The two participants offering Somatology and Logistics indicated that they had joined HE after the technikons were transformed into UoTs and therefore could not answer on curriculum design and assessment during the technikon period (P13 & 14/Som & Log).

5.3.1.2 Relationship between theory and practice

To what extent does the nature of knowledge shape the curriculum design of the various fields of practice in UoTs / in your institution?

The findings indicate that both theoretical knowledge and practice are critical in the curriculum and assessment in the field of Art and Design. The idea that there is a link between theory and practice is also supported by literature (cf. Swart, 2010). This view is reflected in the following extract:

> *As the head of the department, my responses will touch on various programmes in this field. The field of Art and Design is practical by nature, students are exposed to theory before venturing into practice. Theory and practice are linked, but practice features more than theory in projects and tasks given because students create art physically. During assessment, the final product is assessed alongside the theories that students have incorporated. In jewellery design students melt silver to produce any design. If the product produced is not satisfactory, the students rethink of ways of perfecting the process using theory to make the necessary adjustment to solve the problem (P 1/Hed).*

The findings confirm the view that even though it appears that UoT programmes focus on developing skills, the theoretical base is important and serves as the foundation upon which curriculum design and assessment are built (cf. Clarence, 2017). The participant had this to say:

> *In the Industrial Radiography programme, theory is linked to practice. When nuclear physics is taught for example, theory is taught first, after which it is compared with the current state, then applied in context. Technical knowledge is predominantly assessed; however, objective, scientific knowledge is drawn from content and for assessment students are expected to read more because they are expected to analyse, calculate and monitor risks, and inspect materials before engaging in practice (P 2/Ind).*

The extract below also confirms that theory plays an important role in informing practice in different programmes of UoTs. The view is captured as follows:

> *Both theory and practice are equally incorporated in Biomedical Technology. Its strong foundation is in medicine; it thus deals with medical issues and certain health procedural aspects that are supported by theories from Chemistry and Physics. Without students understanding theoretical principles it is difficult to understand lab-practice and analysis of specimens during assessments. For example, a doctor who has two patients with the same symptoms, can still find certain differences between them. The ability to test both patients requires theoretical background and practical skills which needs to be assessed equally (P 3/Bio).*

What the results also revealed are the differences in the focus of each programme in terms of what is sought to be produced. The view is captured in the following assertion:

> *UoTs are career-orientated: they prepare students for the workplace. Although theory is integrated into the Radiography course, the focus is more on practice and specialisation as our niche in producing and exposing our students to technological expertise and knowledge needed in this field. We assess more what students are able to do in the labs during practical sessions than theory. Theory is equally important because without the theoretical background students will not be able to critically analyse, apply knowledge or solve problems (P 4/Rad).*

Captured in the statement below is the idea that although theory and practice play different roles, a link between the two is unavoidable and assessment is based more on what students can demonstrate.

> *Theory informs practice and the two are inseparable, but they had been treated as two separate aspects. Previously, theory was taught before going to the labs to be assessed and to sharpen skills. Currently with the review of programmes there is an interface, in attempting to balance theory and practice with a five-tier diploma which articulates towards a Master's degree. However, I believe that M. Tech should be kept as it is because it maintains a balance between theory and practice (P 5/Thea).*

Changes in the curriculum design and assessment in the Art programme/field of study as known before re-curriculation were implemented in different years in different UoTs with cohorts of students in 2016, 2017 and some in 2018. The response was captured as follows:

> *The old practice of relying on one of the UoTs for the design of various programmes using the same curriculum is criticised for being restrictive and stifling creativity. With the phased-out diploma, most subjects focused more on practice than on theory, but with the new diploma, 50% is allocated to theory and the other 50% to practice. The allocation also depends on the nature of the subjects. In the postgraduate degree, theory constitutes 60% and practice 40% (P.6/CoExt).*

Similar to what other participants articulated, a link between theory and practice is also expressed in the following statement:

> *In the creative field, our programmes use theory, but it is applied to produce a product. Before students are given projects, theory is used as a baseline to give a background of the rationale for why the product is produced. Every project that third-year students*

undertake, they start first with research by reflecting and discussing with peers the steps they have taken and what they have gathered about the company, and the lecturer assesses the research part first. For example, for each design students make for BMW, they first have to do thorough research about the company (P7/Graph).

The importance of theory in the curriculum design as outlined in the above findings is further confirmed in the extract below.

In the Interior and Kitchen Design programmes we have borrowed principles and scientific concepts from Civil Engineering by using the Built Environment textbooks to introduce theory before practice. Assessment includes both theory and practice. Briefs are also used including inviting experts from different fields, such as architects, kitchen designers and chefs as guest lecturers, so that students could discern the collaboration and integration of theory and practice (P 8/Int).

The findings suggest the importance of both theory and skills in the curricula of some of the programmes of UoTs including different assessment tools that are used, and this is articulated as follows:

Both theory and practice form part of the curriculum. Prescribed books and articles from the Internet are used and theory gives a base to content knowledge. However, theory is no longer assessed only through tests and examinations. Use is also made of projects, presentations, group work, critique sessions and reflection and such activities are allocated 20% of the assessment mark. The curriculum is further aligned to outcomes and graduate attributes (P 9/Fash).

The significance of disciplinary knowledge in other programmes is highlighted in the following excerpt as follows:

In Electrical Engineering disciplinary knowledge is more important to prepare students to think analytically and design frameworks, and students are introduced first to principles. Curriculum is well sequenced and taps into disciplines such as Physics, Mathematics and Science (P 10/Engi).

As indicated in the extract that follows, however, the practice is different in the current Human Resource Management programme:

Human Resource Management is more theoretically orientated: you need to learn more theory than skills for practice. About 70% weight or focus is placed on theory. As a result, conceptual knowledge is taught and assessed more than skills (P 11/Hrm).

In the same vein, programmes like Hospitality Management also offer theory and practice, and the time allocation for theory is more than that allocated for practice, as explained in this excerpt:

> *The curriculum allocates about 67% for theory and 33% for practice. What students learn in theory is linked to practice through work integrated learning (WIL) which is done for 6 months in each level, while service learning (SL)is done for two months with Grade 11 learners from selected schools to share and apply knowledge and skills learned (P12/Hosp).*

In the case of Somatology, the weights allocated for theory and practice are equal. This is captured in the following excerpt:

> *There is a balance of 50/50 allocation on both theory and practice in curriculum design and assessment, but practice relies more on theory and if you fail theory according to policy stipulations you are not allowed to proceed to the practical part of that subject or module (P 13/Som).*

The argument advanced by the participant is that both theory and practice are needed in the curriculum and assessment.

> *In Logistics, the concentration is more on theory than on practice. However, a proper balance between theory and practice is enhanced by encouraging students to read books and articles and thereafter assess what they have found before the unit or chapter is covered by the lecturer. Use is also made of case studies to assess what was happening in context and its connection to theory or content, and feedback is obtained in the form of assignments (P 14/Log).*

5.3.1.3 Preparation for the world of work

How does the curriculum design in different professional fields of study at UoTs prepare graduates for the changing market and employment requirements?

The participant indicated that graduate attributes and other generic skills are incorporated into various programmes/field of study as core curriculum outcomes. This is indicated in the following excerpt:

> *Besides the theory and skills imparted to students, graduate attributes are used as benchmarks over the length of a programme and are integrated with the course objectives to guide core curricular values to develop students (P 1/Hed).*

According to the statement below, it can be gathered that industries are in need of specific skills:

> *Technical skills and extensive application of knowledge are at the top of the list of what employers need and with the changing technology UoTs are challenged to link with the standards of industries. From feedback received from industries, when students are placed in industries it is indicated that they lack in specific skills aligned to the career including some of the soft skills (P 2/Ind).*

The following participants indicated that UoTs are key in providing curricula that are relevant to the needs of the workplace. The indication is that in both former technikons and current UoTs, curriculum and assessment are used to prepare students for their careers and to impart the knowledge and skills needed in the workplace. In most programmes, knowledge taught is seen to be in alignment with what is happening in the outside world. Furthermore, inputs of different stakeholders, particularly those of advisory boards, are considered in preparing students for the world of work, and work integrated learning (WIL) is incorporated in fields of study to prepare students for the world of work (P 3 & 4/Bio & Rad).

The findings further reveal common elements that are applicable in most fields of study. Reflective journals, for example, which record feedback obtained from student work placement, may be used to check the responsiveness of the curriculum to industry demands and the alignment to new trends (P 5, 6 & 7/Graph, CoExt &Thea).

The participants mentioned below indicated that principles and concepts are key in assisting students to organise their thoughts systematically when solving problems.

Both participants indicated that foundation principles are important to stimulate students' abilities and capacity to organise their thoughts and follow certain rules in solving problems. Design is about solving a problem: when students design, they think, reason, analyse and integrate theory to solve a problem. If a person does not know the history and theory behind art work, it will not be possible to create or innovate (P 8 & 9/Int & Fash).

Preparing students for the world of work is one of the goals that curriculum aims to achieve, and the following comment captured the practice of several participants:

> *During the technikon era and after they were transformed into UoTs, experiential training was done for a year with a separate mark being allocated for the practice. But due to changes made in HE coupled with the recent economic slump and competition between companies, students in Electrical Engineering, do practical in the lab for a year on their own and marks are allocated (P10/Engi).*

In the field of HRM, unlike other fields where practice is critical to prepare students for the world of work, there is a stronger focus on theory to prepare students for the world of work, and simulations and case studies are used rather than placing the students in industries for work integrated learning. The participant had this to say:

> *HR is a field where you need to learn more theories than practice, and in the past, there was no work integrated learning module. But with the new reforms on curriculum and assessment at second year level, the HR system focuses on preparing students on technology and employability for the whole year (P 11/Hrm).*

Most of the participants argued that specialist knowledge of experienced people in industries is needed. As a result, work integrated learning (WIL) and service learning (SL) are used to realise the connection between higher institutions of learning and the world of work. This is revealed in the following excerpt:

> *Students are placed in industries to gain exposure to what is being done and to apply the knowledge they have learned, including new trends that are found in industries, and curriculum is designed to accommodate the needs of industries or workplace (P12/Hosp).*

With respect to Somatology, the participant said the following:

> *With the current programme, a component of WIL for the practical dimension starts at first year up to third year and is based on lab simulations and practice. Constant meetings with industries enabled us to check whether we are in line with what they need. Furthermore, although principles of Somatology remain the same, technology changes hence it is important to interact with industries to know the difference between machines used in industries and those that are used in universities (P13/Som).*

The findings captured in this extract support the views expressed by most participants: that students are being prepared for the workplace by acquiring conceptual knowledge

and skills. The participant further highlighted the view that students are also prepared to be entrepreneurs.

> *We are not only producing employable students, but we are developing entrepreneurs and innovators as well. Besides graduate attributes, which formulate attributes to be developed, in Logistics emphasis is placed on entrepreneurship and students are encouraged to be innovative and to think outside of the box by incorporating theory into practice (P 14/Log).*

5.3.1.4 Curriculum, assessment, and its impact on student development

How does curriculum design and assessment of different programmes at UoTs prepare graduates to address and reflect on issues of social justice and other challenges of the 21st century?

One of the participants emphasised that in subjects such as Socio-Design and Design, Citizenship has been introduced to give students the opportunity to use their knowledge and skills to deal with social issues. The findings show that community engagement, service learning and work integrated learning also form part of the assessment strategies in terms of which civic responsibility is instilled in students.

> *In the old curriculum, practice was prioritised over content knowledge. But the new curriculum is currently closing the gap. In Socio-Design and Design, the unit Citizenship has been introduced to deal with social issues. Service learning is also part of the assessment strategies whereby civic responsibility is instilled in students. Some of the activities that students do include painting the walls of crèches and decorating children's wards in hospitals (P 1/Hed).*

The findings below indicate that students could not be assessed or do practice without substantial theory to apply knowledge they have acquired. This is articulated in the following extract:

> *Placement in industries is a necessity to allow students to interact with communities of specialists at the workplace and to assist in finding practical solutions to complex tasks that test their understanding and link between theory and practice (P2/Ind).*

With regard to the social impact of the programme the participant had this to say:

Service learning is used as an interactive tool to interact with patients and learn about patient care, patient confidentiality and to learn professional ways of how to communicate patients' results. But I do not think this is done well, there is a need for improvement (P 3/Bio).

The findings highlight the aspect of interacting with communities as part of advocacy and education towards improving societies and contributing towards bridging social inequalities. This was captured as follows:

In Radiography, students do service learning at a third-year level of study and are assessed by engaging and interacting with different members of the communities. When students conduct their service clinics, they educate communities about ultrasound (P 4/Rad).

Reflection and creativity are integrated in programme offerings and assessment activities to sensitise and bring attention to the rights and dignity of people, including critiquing some social inequalities and discriminations. This is captured in the following extract:

Creativity is used to portray the plight of poor people and bring awareness on social justice issues, identity and human rights. Some of the events students reflect on include activities or celebrations of important events such as celebration of Africa and the use of satire or dry humour to highlight some of the disturbing social inequities in the form of drawing, paintings or drama. This forms part of formative assessment (P5/Thea).

Participants argued that curriculum and assessment can have a positive impact on society. This is reflected in the following statement:

The impact of curriculum and assessment through the meaningful application of knowledge and skills improves communities' quality of life. Students apply and share knowledge with communities so that the dignity and rights of society may be achieved with the possibility of contributing towards social freedom and transformation and they are assessed (P 6/CoExt).

The findings confirm the view about curriculum serving the public good by addressing social challenges, and students are assessed on what they produce. This is further supported in the following assertion:

Critical debates, and engagement with society is done, ranging from producing products, posters and designs that portray, the protection of the rights of marginalised

> *groups gay rights, rag-pickers rights including aspects such as, HIV/AIDS, cancer, women abuse etc. for communities to recognise and respect the dignity and the rights of people as outlined in the Constitution of South Africa and to empower communities with knowledge pertinent to solving some their social problems (P 7/Graph).*

The findings further show how curriculum and assessment are made relevant to real life scenarios by linking theory and practice to solve some of the social problems as well as redressing some imbalances. This is articulated by the participant as follows:

> *When students are given projects to be assessed on, they carefully consider all aspects that can hinder the success of their projects by first engaging with communities, as part of community engagement during the revamping and design of the Municipality brand. In the same breath, lecturers who come directly from industries with special expertise but without teaching experience enrol for teaching and learning modules offered by other institutions that are paid for by DHET to improve their practice (P 8/Int).*

The impact of curriculum and assessment in responding to issues of social justice is revealed through marketing activities that cannot be done without considering their effect on people: this is captured in the following extract:

> *Sensitivity to cultural norms is also one of the sub-objectives in fashion designs targeting certain groups, and when students design and market their designs, they become sensitive to the pride and symbols that are of value to a particular society to reinforce their values through designs. Critical reflection is pertinent in giving students opportunities to debate, and to assess the impact of their designs and how they contribute positively towards communities (P 9/Fash).*

At the same time, the idea of contributing towards social mobility in Electrical Engineering is also articulated in the following statement:

> *When students acquire theoretical knowledge, they are expected to use it, to share it and to apply it in the environment where they live as a way of ploughing back to communities. Through community engagement students teach community members how to change bulbs and some ways to save electricity (P 10/Elec).*

In the case of Human Resource Management, the participant indicated the following:

> *In our curriculum design and assessment strategies we build in current issues like HIV/AIDS, people, the planet and the responsibility and reaction bestowed on HR*

> *personnel on this issue; and this gives students enough information to value people's dignity and protect their rights in the workplace situation (P 11/Hrm).*

Similarly, in Hospitality Management, the participant indicated that diversity management is one of the modules that are incorporated in the curriculum to ensure that students learn to be sensitive and learn to work with people from diverse backgrounds (P12/Hosp).

According to the participant, sensitivity to social issues is addressed through activities that are targeted for different groups, and the participant had this to say:

> *Voluntary engagement with communities in offering services at homes for the elderly has been replaced by a service learning subject to deal solely with certain communities, and students are allocated marks for the contribution and knowledge they share and offer to communities as guided by policies. Students are guided in terms of the expected attitude, care and sensitivity they display when deal with different groups of people (P 13/Som).*

Applying policies that benefit and impact positively on society in regard to respect for human dignity and transformation is said to be placing humanity at the centre of curriculum and assessment. This is conveyed by complying with ethical and social responsibility requirements as indicated below:

> *In Logistics, students are taught how to manage business risks by focusing on their impact on human dignity. Ethics as part of the social justice aspect touches on how clients are treated and how policies impact on humanity. Norms of corporate social responsibility (CSR) which companies are expected to comply with are touched and students are given case studies to assess the impact of business on the society with respect to practices of exploitation of companies that mainly concentrate on profit without contributing to community social development (P 14/Log).*

5.3.1.5 Critical reflection and assessment

The findings highlight the view that UoTs are not producing mere technocrats who cannot communicate or share how their designs were conceptualised, but instead are producing students who can think critically, and who can design and communicate. The findings suggest that assessment plays a role in developing students' thinking and

communication abilities, including the ability to use knowledge to reflect on and engage with their immediate environment. This is captured below:

> *In the past, technikons focused on producing technocrats who excelled at drawing and design without communicating the importance thereof. Also, practice used to be prioritised over content. Under the current curriculum Interior Design and Kitchen Design have been collapsed together to balance theory and practice. For assessment students come up with designs and critically reflect, engage, and argue about the rationale behind their designs including their impact of the product on society and the environment (P 1/Hed).*

The assertion is that critical reflection increases the chances of making learning relevant (see Eames & Cates, 2011). Also the findings relating to the excerpt below show that students' critical reflection has an impact on society while also improving teaching and learning styles:

> *Assessment is done by using briefs and critical reflection to reinforce themes that have been covered in the syllabus and these give students the opportunity to critically reflect and engage with the content [...]. Such approaches also assisted lecturers in reshaping and structuring their teaching styles to accommodate students' views (P 2/Ind).*

Similar sentiments are shared in the following statement regarding reflective practices:

> *Reflective practices are done through service learning which is part of the curriculum and assessment strategies whereby students are sent to communities to share their knowledge on blood transfusion practices and come back to class to discuss their observations and what they think can be done to improve the lives of communities (P 3/Bio).*

Moreover, in the field of radiography, reflective practices are also used to develop analytical skills.

> *In Radiography we do peer assessment and self-assessment where students reflect on our practices in comparison with what they have been exposed to or learned in communities of practice (P 4/Rad).*

Moreover, the findings reveal that critical reflection as a form of assessment shows how students engage with society. Participants indicated that during the reflection sessions, students give feedback on the activities they have performed during the practical sessions when they interacted with professionals in industries and communities; this

includes identifying gaps in the curriculum. It was indicated that this is done through a session critiqued by their peers, while lecturers engage students by asking questions relating to what they have done or planned to do to help communities by using their skills and knowledge (P5 & 6/CoExt/Thea).

Clearly, critical reflection is supported by most participants as another way of identifying the needs of society: by communicating with members of society and reflecting on how projects can be used to assist them. This is captured in the following extract:

> *Reflective strategies are used when students design or produce projects. For example, with the project of building a ceramic artefact, students first identify a need and then satisfy that need by applying technological skills. They identify problems in their immediate communities and come up with solutions through a project. They also reflect and select concepts and principles in conjunction with the applicable technology and discuss the advantages or dangers of their interventions (P 7/Graph).*

The findings highlight the view that formative assessment enables students to communicate or share how their designs are conceptualised. This is captured in the statement below:

> *In the past, technikons focused on design without communicating the importance of thereof. Lately, curriculum investigates cost management, sourcing, and facility management in general. Furthermore, students are firstly assessed on costing, sourcing, and management; thereafter on drawing as well as explaining and reflecting on how their drawings and designs have portrayed all aspects pertaining to cost and asset management (P 8/Int).*

As indicated in the following statement, critical reflection gives students an opportunity to relate to their environments:

> *For each project/task given to students, reflective questions were asked on how students conceptualise their projects, and on the socio-economic, political, and environmental measures they have considered. Here, students presented their arguments, and were critiqued by their peers and the lecturer. Topics such as HIV/AIDS, issues of sustainability and recycling were covered, and students presented their views on challenges experienced by the nation and the world in general (P 9/Fash).*

As asserted by the participant, reflective practice is an important aspect that improves learning. This is highlighted in the following excerpt:

> *Reflective practice is essential in any kind of study. Every test we give students makes room for students to reflect and look for their mistakes and share in class with others what went wrong. This allows students to learn from each other and improve their work (P10/Engi).*

An extract from participant 11 captured the following:

> *With regard to Somatology, curriculum and assessment open opportunities for students to use their knowledge and skills for the benefit of communities. Students identify problems in surrounding communities and use critical inquiry to reflect on community issues and apply theory to solve problems.*

Similarly, both formative and summative assessments are used to enhance students' learning. The participant had this to say:

> *As it is impossible to capture day to day issues in this field, case studies are used to simulate people's reactions and their behaviour in the workplace (P11/Hrm).*

The findings confirm that through formative assessment a participatory approach to students' level of understanding can be maximised. This is captured in the following statement:

> *In Somatology we think green and reflect on how to save resources by being innovative and using scarce resources sustainably for the benefit of communities. As a result, students make presentations, debate, and reflect about innovative models, and marks are allocated according to the level of excellence of models and presentation that are made (P12/Som).*

Assessment embraces diversity in the sense of opening up different ways of assessing students. This is captured in the following statement:

> *When students have completed the WIL placement, they are expected to give feedback relating to what they have learned through assignments, reflective portfolios, and presentations, and are then allocated marks. Use is also made of the Bloom's taxonomy on both formative and summative assessment (P13/Hosp).*

The findings confirm that formative assessment as another form of assessment is used to enhance learning and to give students an opportunity to engage extensively with the subject/topic. The following extract shows this:

> *In Logistics we have interactive classes that allow students to participate in the learning process. Before any topic/unit is tackled, students are expected to do an in-depth study by reading about and preparing the topic before the formal lecture is presented. Such opportunities open a two-way interaction between lecturers and students and allow students' thoughts and voices to be heard (P 14/Log)).*

5.3.2 Findings and interpretation on research types

5.3.2.1 Responses from the questionnaire

A report on students' responses and their motivations regarding social justice issues is provided below. What the researcher gathered from students' responses is captured as follows:

Students whose programmes focus on practice felt that the curriculum used creativity, while those whose programmes/fields of study are more theory-based such as those studying Electrical Engineering, Logistics and other similar courses, indicated that disciplines embedding concepts have led them to apply theories when creating and innovating models and projects to solve problems. Electrical Engineering students cited an example of a project that they were busy with which assists communities to save electricity, which had made them think outside of the box and to consider different options. Relations between UoTs and communities in the application of knowledge and skills to serve society can be seen as a social justice issue, hence social justice cannot be achieved in education if content knowledge is marginalised measure (see Zipin, Fataar and Brennan, 2015). Most of the students indicated that learning the theoretical principles and rules and applying these in real-life projects such as in energy-saving projects, had prepared them to be innovative thinkers who assist in solving community development problems. Others indicated that they had been prepared to think like real engineers when solving problems and that they had gone through the steps and applied the rules which assisted them to think logically and to become innovative.

Most students indicated that the curriculum had prepared them to address community challenges and injustices. They were required to motivate their answers, which varied: while some indicated that after having been taught about HIV/AIDS pathology, they had learned to share their skills and knowledge by educating communities; others indicated that they had assisted communities during service-learning activities by contributing their skills to improve the lives of communities. Students also explained how knowledge gathered in their fields of study was applied in other contexts. Some indicated that they had followed the steps they had learned in theory and applied them in real scenarios. For example, in Logistics, students indicated that to understand the theory better, they had shared knowledge with some young entrepreneurs on how logistics works and how to apply for tenders.

In relation to assessment strategies used that allowed students to reflect on their social and cultural experiences and to solve problems, students indicated that through assignments, oral presentations, critiques and reflection, they had learned to present their ideas and to consult scientific sources to motivate their answers more than they did by means of just writing tests. Some students indicated that they had enjoyed the sessions in which they could be active, while others suggested that they preferred listening to the lecturer instead of answering questions. Some responded that they had learned to reason and to organise their thoughts when they were critiqued by their peers. One participant from Electrical Engineering said that after having completed his practical component, he had to bring his logbook and to face a panel who asked him difficult questions. He said that this activity had taught him to write reports in a systematic manner and to question things that were not done according to the principles he had learned during the theory session.

Most of the students indicated that open discussions, research and oral presentations done in class prepared them to reason and think critically, and to consider the impact of their actions on society. They indicated, for example, that the simulation of procurement practices that are debated in class prepared them to analyse policies that are relevant in Logistics, as well as to manage resources and to become accountable. Others indicated that through critical reflection they had learned to take debates outside the classroom and use logic in debating issues further in student organisations to fight for their rights.

The view is that assessment strategies reflect meaningfulness when they enable students to demonstrate understanding about concepts and at the same enable students to use knowledge to solve problems. To this end, the findings about assessment strategies that do not promote passive learning are supported by the literature on reflective assessment strategies, and assessments that engage students in learning are seen to be meaningful and effective in developing their intellectual and emotional capabilities (see Conley, 2011). Reflective strategies are also seen to create a connection between disciplinary knowledge and the subjective experience of the learner to deepen their understanding and move away from the practice of reproducing knowledge without understanding it (see Parker, 2003).

The findings regarding the importance of theoretical knowledge indicate that it assists most students in developing higher-order cognitive abilities and reasoning power. A number of students indicated that both oral and written tasks had taught them to think about and state facts. Those who were enrolled for Logistics indicated that because they had to prepare a unit before the lecturer introduced it, they had learned to bring to class current events that linked with the theoretical subject. Students further indicated that both theory and practice need to be improved.

5.3.2.2 Classroom observation

A report on the classroom observation session that was conducted by the researcher using an observation schedule is provided below.

Classroom observation enables a researcher to observe behaviour and interaction in a social setting. This allows the researcher to see things independently without being told about them (see Creswell, 2013). Classroom observation was done to assess the effectiveness of critical reflection as an assessment strategy. This researcher observed a reflection session of second-year Graphic Design students. This observation was a purposefully selected tool, according to which the researcher was able to observe how students participated, reasoned and interacted with each other regarding the topic under discussion, and included observation of the lecturer's role. The observation session assisted the researcher to see and understand how a participatory approach in a classroom situation improves students learning. She observed how students interrogated the content and how the lecturer's leading questions guided the students in responding

to questions and supporting their assertions with facts from scientific resources. The observation focused on how students reflected on the topic and content of the study. Although this session was about students' critical reflections, the researcher chose to observe the following three categories, namely engagement, reasoning capacity and the use of scientific sources. Field notes were used to record observations, and the researcher observed how the lecturer concerned introduced the topic, divided the students into groups and gave instructions on how the session was to unfold.

5.3.2.2.1 Engagement

Students in groups were expected to give feedback and be critiqued by their peers regarding the briefs that they had been given to prepare. They also had to link this with what they had learned during the WIL placement. Each group reflected on the brief and engaged other groups relating to what they thought the brief entailed. Questions raised by different groups stimulated deep discussions and positive comments and suggestions on what needed to be improved to match market trends, which also touched on the salient points of the brief. During the observation the researcher observed how most of the students participated in the discussion and reflected at length about their experiences, how they confidently asked other groups questions and how the questions were responded to. Where students were not sure about the answer, the lecturer intervened to give guidance. The researcher furthermore observed how each member of a group felt very proud in defending their answers, and how confidence was raised when students were able to answer questions without fear because they had been able to apply the theory they had learned in real-life contexts, and also to identify gaps. She observed how this strategy of assessing students' engagement led to a deeper understanding of content. Not only was confidence boosted but listening skills, logic and cognitive abilities were also improved. The reflective assessment seemed to have been enjoyed by many of the students and allowed groups to compete with one another.

5.3.2.2.2 Reasoning

The researcher observed how students, in presenting their views, were able to argue logically by supporting their arguments with excerpts from the text and quoting from

their prescribed book which may be described as deeper learning (see Pellegrino & Hilton, 2012). They also included examples of what had been done in industries that were relevant to the topic under discussion. This exercise was very effective in developing students' reasoning abilities. The observation showed that students' reasoning abilities can be developed when given activities that encourage them to think and make more use of scientific sources to validate the truth.

5.3.2.2.3 Use of scientific resources

The researcher further observed how students quoted from articles and from the prescribed book as scientific sources to justify their assertions. The level of students' preparedness in relation to how they used the scientific documents to support their stances was noted. Each group performed to the best of its ability and marks were allocated by the lecturer by means of a rubric. The classroom observations provided insight into the significance of giving students a platform to listen to one another, to argue about and discuss pertinent issues relating to their subjects and provide information on the way in which it had impacted them. What the researcher also observed was the manner in which students, in consulting scientific sources, were able to differentiate between facts and opinion and this enhanced their knowledge. The lecturer then summarised the topic and linked it to content by citing examples from the case studies that had been discussed.

5.3.2.2.4 Multiple case studies

The university's role is not to impart only instrumentalist technical skills and passive learning, but is a place for developing logic and thinking abilities that enable one to enter into complex spaces of the knowledge economy. The scenario of the two doctoral degrees in other countries portrayed that theory and application of knowledge are relational and need each other. The mode of assessment used for students to apply their minds and produce designs or solve a problem has shown that the expansion of knowledge from the social domain and assuming universal principles turning it to be scientific is necessary for it to be applied to solve real problems in the social domain. In this instance, students relied on theory to stimulate their mental capacity, and at the same time they also relied on people's experiences to test the feasibility of their plan in

sustaining power. The last scenario tested how innovative students could be in applying knowledge and skills.

5.3 A GRAPHIC SUMMARY OF FINDINGS

The aspects below are highlighted as key in the findings, namely the practical component in the curriculum of different programmes in UoTs, the value of outcomes, how graduates are prepared, the value of theory at the centre of curriculum and assessment, differentiation between theory and practice, a linkage between theory and practice, reflection and other forms of assessment, the use of assessment to develop reasoning capabilities, and how policy impacts on social justice, curriculum and assessment.

The figure below summarises the findings.

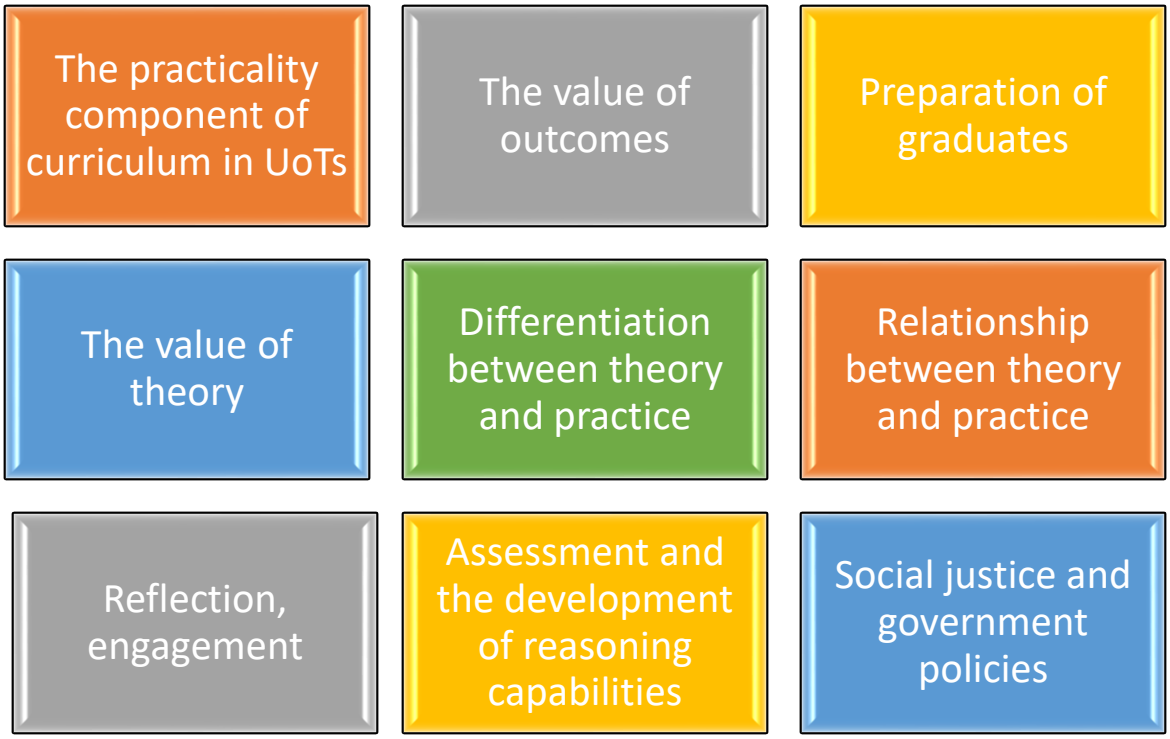

Figure 5.1: Visual summarised framework of the findings

5.4 CHAPTER SUMMARY

This chapter presented the results of the study based on the interviews conducted, semi-structured questions issued to students, classroom observation, document analysis, and the literature reviewed. The value of outcomes in mapping what was to be achieved in different programmes was outlined. The findings shed light upon the forms of knowledge found in the curriculum and in the assessment strategies of different programmes, and upon their impact on students' development and the society. What was also revealed was the value of theory in enabling students to think more deeply and develop their reasoning capabilities. The results also showed the role played by assessment and reflection in developing higher-order cognitive skills, which allow students to debate social justice issues. Moreover, the findings showed how engagement and interaction with theory deepens students' understanding. Discussions, critique, reflections and presentations as different forms of assessment were found to be imperative in improving students' interactions with content knowledge, including building their confidence and ability to systematically organise facts and solve problems.

CHAPTER 6 : SUMMARY, DISCUSSION, RECOMMENDATIONS, RESEARCH CONTRIBUTION AND CONCLUSIONS

6.1 INTRODUCTION

The previous chapter presented the findings and results of the study. Chapter 6 presents a summary of the study, discussion of issues, strengths and challenges, conclusions, contributions, recommendations, implications and concluding remarks.

This study sought to examine curriculum design and modes of assessment within a differentiated system in UoTs and to assess their effect on the development of students. The influence of the past practices of technikons with regard to curriculum design and modes of assessment, the nature of knowledge that shapes the curriculum design in various fields of practice in preparing of graduates for the changing market and employment, and the role of assessment and curriculum in preparing graduates to address issues of social justice and other challenges related to the 21st century were the focal points. The chapters were outlined as follows:

Chapter 1: gave a background and outlined salient points about role players behind curriculum design reforms and the role of the accompanying modes of assessment.

Chapter 2: a literature review touched extensively on the focus of technikons and UoTs and some of the gaps in curriculum and assessment, and also argued about the importance of conceptual knowledge in the curriculum and meaningful ways in which lecturers can assess students in order to maintain the value of education and prepare them to possess skills, but most importantly to be thinkers.

Chapter 3: highlighted in this chapter were the relational aspects of the two knowledge forms and the importance of developing logic which links with the progression of knowledge in assuming scientific features that are applicable universally to enable social problems to be examined in a logical and objective manner.

Chapter 4: explained the paradigm and methodology utilised to answer the research questions. A qualitative research approach was necessary to direct the social justice agenda in order to pursue order by recognising and finding first-hand information and

rich data from views of people who are affected by a social problem and applying knowledge based on scientific principles that assist towards finding truth.

Chapter 5: focused on the findings and the interpretation thereof which were discussed under different themes.

A summary now follows, outlining issues, strengths and challenges, conclusions, contributions, recommendations, implications and concluding remarks.

6.2 SUMMARY OF THE STUDY

Curriculum design and the manner in which assessment is used has been an issue of much debate and criticism in South Africa in recent years. Curriculum has also played a role in supporting the ideologies of governments in power in pursuit of their different socio-economic and political goals. The current study has shown that transformational changes in the country's education system were the result of the influence of global trends and political goals of the government of national unity. As a result, the newly elected government initiated an overhaul of the education system, with a redress of past inequalities which translated into wider access in HEIs, and a response to critical labour needs which needed students to develop skills required by employers. Wider access meant that a large number of students, including those who were ill-prepared, entered HE. The challenge was that the large numbers of students did not match the infra-structure capacity and lecturer-student ratio, and this had an impact on the quality of teaching and learning.

The study has argued about the effect of curriculum and assessment that limit intellectual development due to placing more focus on skills needed for employment, to such an extent that knowledge needed to sustain society and develop students' intellectual abilities – which ought to be used in solving problems in the workplace, in society, and in the ailing economy – was downplayed Epistemological access is considered as one of the critical elements that the transformational agenda has not addressed adequately in preparing students for the 21st century complexities. The key issue is holistic development of students but most importantly the maximisation of thinking abilities and reasoning powers, which enable students to become innovative

and to be able to curb social disorder as well as to have a critical voice in dealing with issues of human dignity, violations of human rights and other social justice issues.

The summary highlights the following salient points:

6.2.1 Reforms

This study has argued that the outcome of the debates relating to modes of assessment and curriculum design that translated into educational reforms including policies that were enacted, were mostly dominated by government, business, and unions (see Healy, Mavomaras & Sloane, 2012). Notably, policy was used to regulate reforms and the route of administrative process was driven in a top-down manner with less engagement by, and voices of, other stakeholders who are confronted with issues of curriculum and assessment on daily basis. Following a redress of past inequalities, the transformation agenda brought about mergers between universities, and the HE education sector was integrated into one single sector. Different approaches to curriculum and the accompanying assessment were introduced, criticised, and changed, but the differentiation between formative and summative assessment was a principle that was kept and continued to be used.

Nevertheless, transformational changes and reforms made were welcomed. Widening access was a good thing, enabling students from disadvantaged backgrounds to have the opportunity to improve their lives and such progress was a step in the right direction with regard to redress and social justice goals. However, in the process of implementing curriculum approaches, gaps in terms of knowledge in the curriculum design and the accompanying assessment became evident and created an imbalance in the positioning of knowledge forms in the curriculum, such that analytical thinking and problem-solving are not fully developed (see Carless, 2015). Furthermore, emphasis placed more on skills in the curriculum impacted on the type of students that were produced and limited the development of intellectual abilities. Alongside expansion of knowledge is also the distinctiveness of a university which is marked by developing thinking abilities and holistic development (see Clarence, 2017). Therefore, students are not supposed to be trained only to be utilised for profit gains, and education should not be turned into an economic capital (see Allais, 2013). However, students ought to be developed holistically. The study finds this as a drift away from the social justice path of freeing

the mind and expanding knowledge and access to a better way of thinking for all as espoused in the White paper 3 on Transformation (see DoE, 1987; Young, 2008; 2013).

Much as skills are important for job employment, the study has argued that holistic development as part of a differentiation and social justice agenda is also important (see CHE, 2013). Of more importance is additional exposure to content knowledge which provides foundational principles to prepare students to become analytical and innovative thinkers (see Sambell, McDowell & Montgomery, 2013). However, the curriculum design and modes of assessment that are used in matching the class sizes do not provide most of the programmes with enough space in accessing what Young (2008-2013) refers as powerful knowledge. As a result, students are not well prepared to function successfully in complex situations where independent thinking is needed to solve problems. Hence the suggestion of creating assessment that enables problem-solving skills to be fully developed (see Carless, 2015).

6.2.2 Technikons and UoTs

The study has argued that the technikon era was marked by a curriculum which prepared students mainly for the labour market and not to be engaged citizens. The curriculum placed a priority on skills rather than on theoretical knowledge, producing technologists, designers, and manufacturers. With the evolution of UoTs, curriculum design and modes of assessment used in most of the programmes still placed an emphasis on skills to be developed to satisfy instant labour demands (see DHET, 2013b).

The study has argued that the preparedness of students should not be focused mainly on skilled labour production which targets a fluid market that can change or collapse at any given time. Curriculum should pursue knowledge which has an everlasting value, which can be relied on beyond classroom borders, and which has the ability to promote students' independent thinking and logic to enable them to solve different complex problems in any situation in which they find themselves. Redress and equality meant a reverse of structures that compartmentalised people into becoming merely labourers rather than becoming specialists, bridging gaps of knowledge, being prepared to close gaps of scarce skills in different sectors of the economy, and contributing meaningfully to the ailing South African economy and social ills.

6.2.3 Theory and practice

The study acknowledges the ongoing changes and review of different programmes in UoTs (see CHE, 2013). Although a cohort of students has not yet exited programmes that have been reviewed, curriculum and assessment in the programme of Art and Design at two of the UoTs for example, have integrated some changes which impact on how curriculum is differentiated between theory and practice and diversified to cater for all students' needs. Data elicited indicated that the scope of programmes has been broadened to enable students to access general concepts before they specialise. With reference to Human Resource Management in one of the UoTs, theoretical knowledge has been the focal area whilst practice was neglected. However, with the current review of the programme, the practical component has been allocated space. The same applies to Somatology, where theory and practice are currently allocated the same weighting. However, assessment still need to be to be tightened to include the higher levels of Bloom's taxonomy.

6.2.4 Disciplinary knowledge

South African educational programmes experience certain knowledge gaps due to a deficit in content and conceptual knowledge (see Rusznyak, 2015). The country will remain behind and will not compete fairly with other global partners if conceptual knowledge is not prioritised. Countries like China, Japan and South Korea are progressing economically and innovating due to the value placed on education, particularly on disciplinary knowledge (see Young & Gamble, 2006). Disciplinary knowledge is regarded as having the ability to deepen understanding behind the logic of practical knowledge since it embeds principles and rules. It is also one of the aspects that differentiates a university from other public institutions where leaders, innovators, professionals, specialists, and researchers are produced who depend on conceptual knowledge for their growth. Thus, more concepts and assessment that enable students' deep engagement with their subjects is mostly needed, such that analytical thinking and problem-solving can be fully developed (see Carless, 2015). Since UoTs have as their primary goals teaching and learning, community engagement and research, they cannot reach such goals if foundational principles are not explored (see Burke, Scurry, Blenkinsopp & Graley, 2016). Epistemic access is further supported by the social

realism stance that enables students to reach the highest form of knowledge that can be applied for the benefit of the society (see Maton & Moore). The researcher thus concurs with assertions that curriculum design and modes of assessment, that are not firmly entrenched in theories and concepts underpinning disciplines, are inadequate because they do not enable students to apply their knowledge in different contexts (see Badat, 2009; Maton, 2013; Ogude et al., 2014; Ntshoe & Selesho, 2016).

6.2.5 Thinking abilities

The study established that the development of practical skills and most importantly the development of the intellect is critical and is to be supported by theories relevant to the real world to solve the problems of society. It has also been argued that quality learning is to be prioritised, so that student thinking abilities may be enhanced. The use of different formative assessment strategies, namely discussions, critiques, critical reflections, projects, tasks and assignments was shown by the study to assist students to communicate and to apply their knowledge and skills to solve problems found in social contexts, while also allowing them to learn in different ways. These strategies enabled them to transcend the mere expression of subjective opinions to being able to back their assertions with facts (see Young & Muller, 2013), which is the right path to promote reasoning and objectivity, and also in line with the social realism stance. In this regard, there is a need to relook at modes of assessment and shift towards meaningful ways of assessing students that engage them towards meaningful learning instead of simply promoting memorisation. This implies that all facilitators in different programmes in UoTs must employ assessment strategies that enhance higher order thinking (see Hale & Astolfi, 2011) so that students are able to analyse and view the world critically and to use the knowledge and skills they have acquired to transcend to the 21st century space of knowledge complexities.

6.2.6 Differentiation

Curriculum design and modes of assessment were further examined in relation to differentiation between theory and practice in the context of UoTs. What the study pointed out was that, unlike traditional universities which focus on teaching scientific

principles, UoTs focus on technology, skills, theory and applied science in the real world through designing, manufacturing or building to solve problems in society. UoTs are also not isolated from industries, communities and other stakeholders' interests, and their programmes are aligned with the interests and labour needs of industries. This in itself indicates that they are able to reach out to different students with different abilities.

Differentiation into formative and summative assessments has also been revealed to accommodate diverse ways of learning and enabling students to take part in the learning process in a meaningful way, but this is not done effectively. Differentiated teaching, which also integrates theory, practice and technology into diversified ways of learning, enabling graduates to adapt to change needs further improvement, implies that facilitators need effective training so that they can use different modes of assessment effectively, particularly the higher levels of Bloom's Taxonomy, which enables students to develop their analytical and critical thinking abilities. The assertion is that the discourse of curriculum design and assessment needs to consider the mission of UoTs, which is to produce technologically skilled and knowledgeable students who can also contextualise problems and solve them strategically.

6.2.7 Civic engagement

The researcher further argues that since curriculum design and the accompanying assessment forms are not only poorly creating an interaction between the individual and his/her social environment, they are also creating an appalling detachment from and abandonment of citizens' civic responsibilities which escalate to the failure of curriculum to transform its societies or to enable them to change for the better. These are missing attributes at present because the kind of curriculum design and assessment strategies followed do not develop students to be able to engage in socio-political discourses. Rather, they create the type of graduates who would not take leading roles in solving problems in their individual and social spaces (see Wheelahan, 2010). This exacerbates the failure of universities to produce graduates who will adopt responsible roles in building the country's future by strengthening the element of critical discourse. This implies that community engagement or service learning activities in UoTs are not to be done not in a passive manner, but rather that they need to engage the university and students in knowledge-sharing initiatives by assisting society to sustain and help

themselves by sharing knowledge; for example on how to save electricity or water, or how to go about other civic activities.

6.3 STRENGTHS AND CHALLENGES OF THE STUDY

6.3.1 The choice of social realism

The phenomenon under study concerns people's experiences in their social world and the nature of knowledge they are exposed to. As a result, the selection of social realism as a theoretical framework contributed towards embracing the nature of participants' experience in their social world and towards highlighting the nature of scientific knowledge beyond human thought. The strength of social realism is in recognising both the social and the natural reality of knowledge, independent of human thought. The argument is that even though science and humanities use different codes or languages, the link between the two is important to accommodate the humanistic aspects of knowers, their personal attributes, human dignity, and values including their moral obligations.

Knowledge grounded on rules and theories (see Maton & Moore, 2010; Young, 2013b) enables students to transcend from the horizontal level of subjectivity and low level of thinking to complex levels of rational and abstract thinking. This highlighted strongly the importance of a link between the two forms of knowledge important for holistic development, namely social and the scientific elements (see Maton & Moore, 2010), thus making the choice of the social realism framework in guiding the study appropriate. In this regard, the value of scientific knowledge is realised not for itself, but knowledge from disciplines becomes more significant when it is applied to benefit society by contributing through innovations and models that contribute towards social progress and solving both economic and social problems.

6.3.2 The choice of an interpretivist paradigm

The use of an interpretivist paradigm, which aims to explain the subjective meanings that lie behind social action, was also significant in the sense that data from the social context of those dealing with students could be described. The choice of an interpretivist research paradigm also complemented the chosen framework. The adoption of a

phenomenological assumption of allowing multiple interpretations of reality as viewed by social actors also assisted in highlighting consciousness about hidden social forces and structures. The phenomenological assumption allowed for the world to be examined in the manner in which social actors experience it, both from within and externally in their daily experiences so that they are able to challenge some of the wrong assumptions that hinder them from making their social world ideal.

To this effect, the social world, characterised by interaction, frequent communication and sharing of information, promotes active learning. It indicates that while experience is a teacher, theory teaches more, and this is the cornerstone of systematic knowledge. As a result, integrating the two modes of knowledge, theory and skills, while placing theory at the centre, creates a better learning space to equip students with different modes of knowledges. Studies in social sciences also advocate for integration between theory and practice but are not emphatic about placing theoretical knowledge at the centre of curriculum (Wheelahan, 2010).

6.3.3 The importance of literature

Literature was important in directing the study towards a curriculum that aimed to meet the needs of the nation inclusive of social, economic and political needs. The literature highlighted the centrality of theory for curriculum and assessment in contributing towards enhancing students' logical and thinking capabilities. It also contributed by differentiating between theory and practice and highlighted the importance of theory in the centre of curriculum.

6.3.4 Research methodology and the research type

The use of purposive sampling, interviews, classroom observation and policy documents also added depth and meaning to the study. The methodology employed allowed the collection of qualitative data, in terms of which the researcher investigated a problem in a real social setting by relying on the views and experiences of social actors in interpreting meaning, thus enriching the study.

6.3.4.1 Instruments

Interviews were the main instruments used to obtain rich data from those with experience and knowledge about curriculum and assessment. Through interviews, a broader view of curriculum design and assessment in different fields of study was obtained. The convenience of face-to-face interviews made it easier for the interviewee to respond to the questions, and to feel comfortable in expressing his or her views relating to the study. These responses provided extensive information. Through gestures displayed by interviewees, the researcher was able to detect whether the questions needed to be rephrased or clarified, and this could be done immediately. The interview format also allowed for probing questions to be asked where relevant, thus adding further information to the subject under investigation.

6.3.4.1.1 Challenges limiting the number of participants

Challenges that limited the number of participants interviewed included poor communication and feedback from those who were requested to participate, as well as unanswered and undelivered e-mails to institutions where participants were targeted. Another serious challenge was that some individuals did not make themselves available for scheduled appointments. In instances where Skype was used through the university e-learning centre to connect to participants from other UoTs, technology connection challenges delayed the interview process. Furthermore, one of the research questions presented to lecturers, for example, needed information about technikons and only some lecturers could answer the question as they had no experience of the technikon era. However, the use of different instruments was included to ensure that the findings are credible.

6.3.4.2 Research type

6.3.4.2.1 Classroom observation

The classroom observation session attended by the researcher assisted in broadening her understanding of how students debate when they interrogate content, and how they interact with each other while learning at the same time about social dynamics and how to use conflict resolution strategies as part of their function as civic-minded citizens.

The opportunity for classroom observation furthermore yielded first-hand information about activities enjoyed by students, in which they were given opportunities to participate in discussions and to air their views, while at the same time developing their logical thinking abilities through the guidance of the lecturer. Through participation in the learning process, students could exercise their right of freedom of expression as reflected in the Constitution of the Republic of South Africa (RSA, 1996).

Classroom observation confirmed that the participation of students in the learning process was a display of democracy in action, and a reflection of their constitutional rights. Through discussion, engagement, peer critique and reflection, students' voices were allocated a space in the curriculum (see Blackmore & Kandiko, 2012:12). Such forms of assessment respond to the issue of differentiation through which curriculum and assessment are to play a critical role in accommodating a diversified host of students from different backgrounds and reach out to them; however not all programmes are using these modes of assessment.

6.3.4.2.2 Questionnaires

One part of the open-ended questions that were issued to students required them to indicate whether they agreed or disagreed with a statement, and then to motivate their answers. Some of the students did not motivate their answers, possibly because they were responding to the questions independently without assistance. This weakness, evidenced in this instrument, indicates that to get more information from students, one could perhaps have used focus group interviews.

6.3.4.2.3 Multiple case studies analyis

The multiple case studies broadened the understanding of the phenomenon under study by showing some similarities within the different institutions under study and corroborated the data collected from interviews with other lecturers. The contributors also provided a narrative and an in-depth description of their experiences with regard to curriculum design and assessment modes followed in UoTs.

6.3.5 Theoretical concessions

A positive contribution was also made by social constructivism, in its emphasis on student-centredness and the importance of their active participation in the process of learning. Similarly, disciplinary knowledge that resides in institutions of learning takes the central position from which other knowledge modalities draw in order to enhance other modes of knowledge. The integration of these different knowledge modalities thus makes knowledge more meaningful and yields better results when they are integrated. The belief in the external existence of knowledge and its independence from human thought in both critical realism and social realism is an important consideration to indicate the value and the importance of drawing from disciplines in contributing towards systematic learning. Social realism enables dialogue that in turn enables an integration of intellectual capabilities; the act of doing this implies that knowledge arising from people's experiences and practices in the social realm is recognised together with knowledge embedded in disciplines, which provides the basis for principles to inform objectively the solving of social problems. This indicates that knowledge is not acquired for its own sake. The movement from a simplistic view of the world towards epistemological access to knowledge is necessary to expand thinking towards understanding the complex reality of the world. The focus is on depth of understanding, to provide students with various opportunities to practise what they have learned in a variety of contexts.

The following section discusses the findings as guided by the research questions.

6.4 DISCUSSION OF THE FINDINGS

The discussion highlights five issues that emerged from the research questions of the study.

6.4.1 Issue 1: Emphasis on skills

Training for labour is a feature which was synonymous with the technikons, which were intended to produce technologists. A curriculum and accompanying modes of assessment used for measurable indicators adds its own weight to curriculum orientation such that the focus more on skills to be demonstrated might well fulfil the goal of

providing skilled labour for the labour market, but it also ensures that students exit the programme without developing other capabilities. The view is that a curriculum and the type of assessment used that place too much emphasis on skills are one-dimensional and do not develop students holistically. The numerous changes that have been made to the curriculum and how assessment has been used years later into the democratic dispensation, as also mentioned by participants in response to interview questions, bear testimony to this. Students who exit from a programme in which the focus has been placed more on skills than on any other attributes are generally productive only in the lower ranks of the job market. Such an approach is also poor in developing the individual's potential to innovate and to think creatively. The researcher is of the view that mastery of a skill is a good thing and can enable self-employment and the generation of income. However, if the mastery of skills is not complemented by theoretical knowledge which sharpens intellectual abilities, it makes it difficult for individuals to move up the ladder into higher positions in the job market because the gaps in the individual's knowledge hamper his or her ability to analyse and to think critically. Also, those who venture into self-employment might well find that they lack the ability to solve complex problems which implies that the development of thinking abilities is critical.

The prevailing reforms have shown that the dominance of skills over theory in the curriculum created gaps in conceptual knowledge and stood on the way of students' development in other areas. Moreover, focusing mainly on skills to be performed compartmentalises knowledge, leads to a situation where individuals can only perform certain learned tasks, and does not open the way to creativity and innovation. As postulated in Chapter 1, starting with the end in mind in terms of what is to be demonstrated before content can be infused sounds reasonable, but not all learning can be defined in terms of demonstrable skills (see Waghid, 2003). As a result of this polarisation and the failure to recognise the unique role played by each knowledge dimension in the curriculum, knowledge gaps were created. The suggestion is that rather than training students for segmented specific skills, a general grounding in relevant theory should serve as a foundation before a skill is crafted.

The focus mainly on practical knowledge defeats the goal of steering people towards the rational objectivity needed to respond to contextual issues. It is important to ensure that the curriculum makes provision of the kind of knowledge that gives rise to

systematic learning to enhance overall learning. Hence, a re-curriculation/review of programmes was a necessary step in realigning and positioning theoretical knowledge, and to bring theory and practice together in the curriculum in most of the fields of study in UoTs.

6.4.2 Issue 2: Theory and practice

The study argues that the nature of knowledge in most of the programmes is composed of both theory and practice with varying degrees of emphasis. The theory part of the curriculum that is rooted in disciplines, however, creates a strong base from which practice can draw. Curriculum design and assessment in some of the fields of study/programmes considered in this study, namely Biomedical Technology, Electrical Engineering, Somatology and Human Resource Management, drew more from disciplines for foundational concepts and principles than fields such as Graphic Design, Fashion, Industrial Radiography and Logistics did. Also, the route followed in the curriculum design of Electrical Engineering for example, laid a strong foundational base of theory with proper sequencing from an entry level upwards to higher levels, which suggests the importance of differentiation of knowledge which is vertically sequenced to yield to a systematic ordering of knowledge while linking with practice. Biomedical Technology, which draws on Medicine, has also been shown to have a well-entrenched theoretical baseline to enable students to analyse specimens while at the same time using skills to apply theory.

In consideration of weaknesses in the curriculum which moved knowledge from its central position, it is deduced that the repositioning of types of knowledge in the form of the current ongoing re-curriculation is the right step to embrace different modes of knowledge, and to bring theoretical knowledge back to the centre of the curriculum. On the other hand, putting what one has learned into practice, as is done in Somatology, Art and Design, Radiography, Hospitality Management, Biomedical Technology and Electrical Engineering, supports the practical value of learning concepts in becoming better practitioners who value both conceptual knowledge and experience. It is thus concluded that having knowledge of the theory behind a practical concept opens up access to a diverse and broad range of ideas that can be used to develop possible

solutions to problems. As a result, students who are prepared through this integration of knowledge and skills training become more rounded practitioners.

Arising from the above scenarios, it is argued that a synergy between theory and practice is desirable and in fact unavoidable. The topical issue is therefore to consider bringing objectivity to knowledge by placing theoretical knowledge at the centre of curriculum design to support learning through the use of modes of assessment that deepens learning. Currently, cohorts of students who enter university and those who exit at diploma level still lack the ability to analyse texts critically, and this can be attributed to lack of integration between practice and theoretical knowledge but most importantly, poor attention to conceptual knowledge. The proposal is that a combination of theory and practical knowledge ought to be considered in the curriculum design and modes of assessment used in order to strengthen understanding behind the logic of practical knowledge as well as providing a sound base for the solving of problems. Moreover, the value of understanding theoretical concepts is immense and also prepares students to be better practitioners who can innovate.

The view of the researcher is that skills are made visible through practice in the process of producing a product. However, the unnoticeable and invisible thread behind the quality of a product lies in the acquisition of concepts and principles that have been internalised to inform the systematic application of those skills. Assessing projects designed by students, such as the design of stamps, the revamping of a municipality or the building of an artefact, and using critical reflection strategies, allowed students to explain the process and not only the results of completing their project. This was also the case with Radiography students, who applied knowledge relating to theory when they provided the community with information relating to concepts, processes and the importance of screening for breast cancer. For example, the curriculum design and assessment in programmes like Hospitality Management, Somatology and Industrial Radiography are professionally based, and they integrate practice and theory while also drawing knowledge from theory. The reason for linking knowledge whilst placing theory in the centre of curriculum is that a concept-based curriculum represents a hierarchical abstract type of knowledge which is characterised by principles and rules, while a contextually dominated curriculum represents occupations that are specific and segmented and address a context and a specific purpose (see Muller, 2008). This implies that in differentiating between theory and practice, curriculum must also maintain a

balance and a link between different dimensions of knowledge to develop both reasoning and practical capacities.

This also gives impetus to the suggestion that the neglect of theoretical knowledge in the curriculum devalues the intellectual rigour needed for reasoning, which results in a deficit of proper logical solutions to social, economic, political, environmental and other problems. The more skilful and knowledgeable students become, the more the community benefits because graduates will bring new perspectives to problems and will be able to find solutions in a scholarly scientific manner. It can clearly be confirmed that the state of curriculum design and assessment can be enhanced by exposing students to knowledge which is not changed by experiences or context; in other words, by placing conceptual knowledge at the centre of curriculum design and assessment in different fields of study.

6.4.3 Issue 3: Outcomes approach

The curriculum has been caught amidst driving ideological preferences, goals and policies of the government in power. The use of outcomes, as adopted by the outcomes approach to curriculum, assisted in breaking down what needed to be covered in a lesson into smaller units. In addition, the emphasis on outcomes was confirmed to have influenced some of the programmes or fields of study in the sense that more weight was placed on skills than on conceptual knowledge. However, there are some benefits that can be drawn from an outcomes approach to curriculum, some of which include the ability to explain what the syllabus will cover, as well as how assessment will be undertaken in terms of specific goals to be achieved. In this way the process of assessment is demystified and a common understanding amongst both the staff and students of what the syllabus covers is ensured.

Besides specifying the work to be done, outcomes have additional benefits for students, who can scan the work on their own even before the unit is dealt with in class, which gives a clear idea of what the syllabus or unit seeks to achieve. This is a democratic process that engages students and establishes transparency regarding the syllabus or unit. Although outcomes give direction about skills to be demonstrated, they fall short in terms of objectives which create fertile ground for logic to be developed in outlining factual content, concentrating only on the results or the visible product.

In addition, knowledge is drawn from our daily experiences and the meaning we make from our contact with the world. As a result, a sequential articulation in a curriculum is necessary to bring a paradigm shift to students' outlook on life from a subjective to a rational position. Theoretical and scientific principles are equally important. This implies that contextual knowledge cannot be the only source from which we draw knowledge because it is subjective. This means that subjective knowledge needs to be complemented by theoretical knowledge to enable students to follow a hierarchical path of development.

6.4.4 Issue 4: The world of work

In most of the programmes, curriculum design and assessment are used to prepare students for their careers by focusing on relevant skills needed for the labour market. This is in line with the demands of the world of work presented through advisory boards, which place priority on the types of graduates that are needed for the workplace. In this regard, the study corroborates the idea that a visible show of skills demonstrated by students in the process of acquiring knowledge takes precedence over invisible internalised knowledge which develops a deeper understanding. This inadequate and unbalanced acquisition of knowledge in the design of curricula was declared to be a hindrance to the process of developing students holistically (Muller, 2000). This clearly indicates that the issue of employability is the main overarching goal of career-focused offerings. The study has thus confirmed that in the process of developing skills for the workplace, content knowledge is not sufficiently tapped into because concentration is more on the skills component of curriculum (Maton, 2009).

The niche areas of UoTs have been in applied sciences, skills and technology. However, due to policy prescripts that accompanied transformation in later years after democracy was introduced, the curriculum design of UoTs translated into producing skilled graduates who would be attractive to the market needs, and theory was allocated less space in comparison with practice. Even though skills have been the main emphasis, employers are still complaining about the competency of graduates. However, growth and development in society cannot be built merely on skills to serve economic activities without laying the foundation of principles and rules pertaining to conceptual

knowledge. This is needed to effect transformational change in the way people think, and how they improve their own and other people's lives.

6.4.5 Issue 5: Assessment, reflection, and social justice

Through group projects, students learn group dynamics and engage with their peers, and transfer what they have learned to communities. Although the activities of students in various programmes differ – some design posters, others undertake individual projects or community engagement projects, for example – all are attempts aimed at solving social justice issues, and at raising awareness amongst communities around issues such as HIV/AIDS, cancer, abuse of women, etc. In some programmes, service learning or projects take various forms and processes; some activities may be used by students to portray their messages, and sometimes students discuss and critique each other about the impact of their projects on communities. All of these assist in raising awareness in communities.

Community engagement projects or activities in the fields of Radiography and Art and Design are viewed as part of the development of thinking that is accompanied by civic responsibility, and as part of embracing social values. This is recognised as a way of ploughing back knowledge into the society from which students come. Such activities afford students the opportunity to reflect and communicate their thoughts, and sometimes lead to changing their own thinking and improving the lives of others. Community projects may also be likened to waves, whereby subjective knowledge constructed by society is returned to it in thicker waves strengthened by disciplines that are enriched by theories and concepts at a higher level, allowing students to reason and serve society better. It is concluded that by this means, students are given an opportunity to interact with society, identify some of the problems, to reflect critically, to debate and use skills and knowledge they have acquired to solve problems in unfamiliar contexts in communities.

In the curriculum design of Fashion and Graphic Design, reflection on social justice issues is included as part of the objectives of the subject. The study suggests that before any design can be made, and before any form of marketing can be done, the first thing to be observed is sensitivity to and respect for the rights of the society. Students are thus encouraged to reflect, debate, reason and assess the impact of their design on

communities, by creating awareness through artwork about the dignity, values and culture of marginalised groups in society. Student engagements with communities and the impact of their inputs on society corroborate with the literature regarding the view that people must influence the social space where knowledge is produced (Bernstein, 1983).

The most important lesson presented by the study about critical reflection tasks done by students is the linking and selection of concepts that are used together with technical knowledge and discussions amongst peers until the project reaches its final goal. For example, reflective questions to which students responded on how they conceptualised their projects, and on measures they took to relate to socio-economic, political and environmental aspects, aided them to realise that knowledge offered in the curriculum can be applied in their own context. Topics such as sustainability through recycling, curbing pollution and electricity-saving, addressed by means of projects, allowed students to engage with challenges in their immediate communities and the world in general in line with sustainable millennium goals.

In the curriculum design and assessment of Interior Design, students were trained in how to be sensitive to their surroundings. As a result, briefs are used to maximise students' engagement with the subject of how to use theory to critique briefs and projects. Projects like the design of stamps and the revamping of a municipality's brand indicated a shift from producing technicians or technologists who excel in drawings and designs only, creating an opportunity for students to share their thoughts, engage with others and explain the processes followed; this was an element which was not there during the technikon era, as highlighted in the interviews (see Chapter 5). The implication of these findings is that the active involvement of students in their subject, as well as drawing more on theories, translates into deep learning. Consequently, a deep approach to learning has an influence on higher academic achievement (Chan, 2016).

The use of critique is another reflection strategy which makes learning effective because students are actively involved. What stood out in relation to reflection as part of project design is the idea of drawing lessons from reflective practices to improve the teaching and learning strategies used to convey the subject in a meaningful way. The suggestion is that a classroom situation must be used as a social space for building students' confidence and preparing them to engage in larger civic spaces where their voices are

needed to solve problems. The use of case studies or discussion as part of the assessment thus yielded positive results in terms of enhancing students' knowledge.

Other discoveries include the important role played by assessment in promoting teaching and learning. Quality of learning and deeper learning depend on the type of assessment strategies that are used. In line with social realism, recognising the social background from which students come gives them the opportunity to express their relatively simple views while they are also being introduced to the complex knowledge of theoretical knowledge or scientific principles in pursuit of rational objectivity. This is done when lecturers assess factual knowledge through open-book assignments and briefs, which require students to consult scientific sources to support their assertions. This includes tasks that require application of skills that enable students to use their experiences in internalising theoretical knowledge.

The stimulation of students' thinking to maximise their intellectual abilities is significant and adds to their holistic development. This implies that assessment needs to be used effectively to create two-way communication in a classroom. The best assessment tools uncovered in the study were, amongst others, case studies or briefs, critiques and oral presentations based on content that stimulate thinking while also maintaining a balance between knowledge forms in the curriculum design and assessment. Critical reflection strategies, debates and engaged discussions are also assessment strategies that can be used to access epistemological knowledge to enhance holistic thinking needed to address social justice issues.

6.4.6 Issue 6: Intellectual power

The study has established that the development of inquiry was poor in comparison with the speed at which skills and technological knowledge are acquired. However, intellectual power was shown to make a difference in people's lives, especially in the way they analyse the world. In the context of constantly changing knowledge, including knowledge pertinent to the current challenges in the world innovations founded on new principles and new concepts including social justice issues require assessment and curricula that develop higher levels of thinking such as analytical skills, critical thinking and good problem-solving skills. Participants' responses corroborate the literature in showing that interactive communication between students and lecturers allows for

critical reflection, discussions and engagement, not only with the subject but also in how it can be applied for the benefit of others. In addition, to provide knowledge which is not provided at home, expanded intervention mechanisms of teaching and learning and effective assessment strategies that enable students to justify their positions, are critical. This has implications for the way in which different knowledge forms are tapped in the curriculum to allow for optimal functioning of knowledge to develop skills and intellectual capacity.

The flipped classroom (exposing students to a topic before the lecturer explains it) is also a teaching and learning strategy that involves independent and deep learning. It too allows students to understand the topic better so that they can come up with questions that relate to their context, and it leads to robust debate and deeper understanding. When the lecturer explains and summarises the topic, students are fully involved and can contribute their ideas and expand their thinking. It is proposed that giving students topics before they are treated in class, as done in Logistics, is a good practice that should be followed in different programmes because it gives students the opportunity to engage and debate issues. This not only makes students think but also deepens knowledge and understanding, and contributes towards developing intellectual power, innovation, analytical thinking and creativity. Using logic as a procedure to find the truth is an attempt to move knowledge to a higher level, and therefore students need to be exposed to forms of knowledge that will make them exercise logic and other cognitive abilities to expand their horizons.

Students' interrogation of policies in Logistics teaches them to reason, to assess risks and to manage resources; they also learn respect for the rights of others and cautiousness about the impact of their actions on the lives of others as a social justice issue. From the classroom observation conducted, it can be said that the opportunity given to students to interrogate content and use certain articles to support their claims added weight to the rationale for the use of articles and case studies as effective assessment strategies to integrate content knowledge. Moreover, this participatory method of engaging students developed their communication skills and stimulated thought-provoking discussions that made learning effective. Logistics students, in planning activities, learned to reach out to communities and to take care of their needs by applying principles of social responsibility. Through case studies they learned to assess the impact of certain business activities on society.

To penetrate the vertical level of complexity of high-level thinking in the process of teaching and learning, it becomes necessary to build capacity for students to use logic and analysis in line with scientific principles when voicing their views or critiquing things in their world. In other words, a curriculum needs a balance and recognition of the two forms of knowledge to develop students in a balanced way. Further, curriculum design and assessment should be structured such that different forms of knowledge are recognised. This is envisaged as responding to real social challenges through research, logical reasoning and factual claims as well as engaging with the question of whose knowledge and what knowledge should dominate curriculum discourse. Thus, further review of programmes is thus suggested as the right step towards preparing students for the world of production without venturing into research to grow their respective professions.

6.5 RESEARCH CONCLUSIONS

This study shed some light on the importance of developing students' skills and thinking abilities so as to prepare them for the 21st century world which needs analytical and innovative thinking skills. The study has shown that both knowledge of constructors and scientific knowledge possess value, but they are different in the sense that the one emanates from cultural practices and is thus localised, while the other is universal, systematic, stable and carries the same scientific principles known for centuries across nations. Also highlighted was the distinctiveness of a university with regard to knowledge that students must access.

Although universities are classified differently, a common factor that characterises them is their role in developing students' cognitive aspects to cope with the world demands (see Yates & Grumet, 2011). This indicates how important the development of intellectual abilities are, in shaping students' growth. The priorities of UoTs, like those of other universities, are teaching and learning, research and community engagement, and as a result, they are no longer expected to develop students mainly for work employment but they must rather increase the students' capacity to do research and to become innovative. The development of reasoning in developing good citizens who will manage social issues thus needs the mind to be sharpened through assessment activities that will enhance logic to be used in the social space. Therefore, conceptual

knowledge is needed to stimulate the intellect and to transform communities because varying needs of different members of the society cannot not be met by focusing exclusively on skills.

In other words, students should be developed beyond the confines of skills to save the cost of time and labour; the acquisition of skills must be supplemented by conceptual knowledge enabling students and graduates to solve complex problems in their line of specialisation. UoTs as centres of learning therefore carry the responsibility for developing students to be better professionals and better citizens who will use their reasoning abilities to challenge and address socio-economic problems.

It is true that a balance between theory and practice has been achieved to some degree in the ongoing reviews of most of the programmes under study. The conclusion thus drawn is that UoTs, in differentiating between theory and practice in the curriculum design and assessment, have a dual mandate to serve both the private and the public good by producing career- and discipline-based curricula. For that reason, it is concluded that an integrative approach to curriculum is all-encompassing because it creates a space for specialisation through both skills and intellectual growth.

A curriculum which recognises and differentiates between knowledge as constructed by people and knowledge existing independently outside human thoughts contributes to enhancing research to improve the human condition. As a result, the incorporation of principles of abstract knowledge and their application in practical, real-life situations can produce meaningful impacts on society, thus benefiting communities. Skills, principles and concepts are equally vital for the holistic development of students; these two factors are critical in the curriculum and assessment of different fields of study in UoTs to improve the lives of many, particularly those of lower socio-economic status.

The study has confirmed that informal knowledge acquired from different experiences, cultures and beliefs may generate stereotypes that limit rational and objective thoughts which concentrate on horizontal access. It is concluded that a necessary condition for providing South African learners with access to true knowledge in an emerging democracy is to allow them the opportunity to engage, think and to use values and principles they have learned, and to apply them in their everyday experiences alongside factual knowledge. This is indicative of vertical access. Additionally, being a graduate is synonymous with being knowledgeable, skilled, possessed of desirable values,

character, and humanity, and being able to use logic which is aligned with theoretical concepts.

On the basis of different assessment strategies that engaged students and stimulated their thinking, it can be concluded that assessment plays an important role in directing the path of learning. A variety of methods, particularly those that provide students with opportunities to think critically, contributes towards developing their intellectual powers. Activities that allow students to be involved and to work with others as a team enable them to see the world in a holistic way and prepare them to deal with real life challenges in their civic and social spaces. In so doing, the mission of a university to develop students' intellectual powers and to generate knowledge through research and innovation is realised. It thus becomes mandatory that the curriculum design of UoTs has to find a way to sustain intellectual and holistic development.

Assessment strategies that allow for the use of scientific documents not only create a space for dialogue, but also develop and encourage students to be rational when solving problems. Based on this engagement, the conclusion is drawn that discussions, engagement, peer critique, and critical reflection raise students' confidence and enable the ability to think analytically. Using assessment to encourage students to communicate and share their views in a social context moves them along the continuum of the known towards the unknown and effectively creates a coalition of the social and factual worlds. This implies that content is made accessible to students by linking it with their social contexts and allowing them to communicate their experiences while creating meaning by engaging with scientific ideas to broaden their scope of knowledge. It may thus be concluded that a participatory approach to assessment is an effective strategy to enhance learning.

It is mandated by the Constitution (RSA, 1996) that people must be placed at the centre of every form of development and that the rights of the people of South Africa must be upheld. Curriculum is expected to respond to the needs of the people and to promote their quality of life by following a human-centred approach. On the basis that the curriculum is a public good, it is concluded that the curriculum is obliged to respond to human needs by exposing students to science, but at the same time to value, respect and treat students as citizens who are worthy to be listened to and developed accordingly. The latest developments of programme reviews and the attempts to place theoretical

knowledge at the centre of curriculum and assessment while maintaining a relationship between theory and practice are positive strides. The role of institutions of higher learning as producers of scientific knowledge should be strengthened, and not undermined by the ideologies of those in power who would influence changes in the curriculum without hearing people's voices.

An engaged and productive society and economy are dependent on educated, skilled and capable graduates who can use their intellectual capacities to think critically and innovatively, and to solve problems. However, the current curriculum design and the accompanying modes of assessments do not focus effectively on maximising the development of intellectual abilities due to the overarching political goals and the economic global pressures that the state is driving through curriculum and the accompanying assessment. Curriculum and assessment in South Africa have not registered a positive impact on society in terms of reducing the level of poverty and other social ills. Like the curriculum and assessment which prevailed during apartheid era in driving political ideology by withholding access to powerful knowledge from the majority of Africans, and its outcomes that led to underdevelopment of the majority of the population, the current post-1994 curriculum and assessment which has been focused on training and skilling for economic development competences, does not necessarily resonate with the skills needed by society and the economy, and they have not assisted in reducing the high levels of poverty, inequality and unemployment in South Africa. These are indications that curriculum design and the accompanying modes of assessment need further improvement.

The ongoing reviewing of programmes as a form of transformational change aligned with the humanistic approach is therefore strongly supported, together with a people-centred orientation to teaching and learning that creates a space for social mobility as well as economic growth. However, the interests of the economy are placed before those of the society in the curriculum design and modes of assessment currently used.

This shifts the focus of curricula to both economic growth and the social needs of communities in any particular region. UoTs should assist communities around them with their technological skills as well as their problem-solving abilities. In order to close the gaps caused by areas lacking in underlying theoretical knowledge, curricula should increase the stimulation of independent thinking. It is further suggested that assessment

criteria used must be able to relate and speak to challenges in the real world. Case studies appear to be amongst the most relevant strategies to enable knowledge acquired through study of theories to be applied meaningfully in the real world.

It is critical for every citizen of South Africa to have access to the powerful knowledge embedded in theories found in institutions of learning; for them to be able to analyse, critique, judge and address some of the many problems that threaten their lives; to improve their own lives; and also to become effective in the workplace and in their own civic spaces. It is recommended that the curriculum should not focus mainly on skilled labour production which targets a fluid market that can change or collapse at any given time, but should rather prioritise the generation of new knowledge enhanced by research. Students should be developed holistically through concepts and theories found in disciplines, to enable them not only to occupy low level positions that require mainly the application of skills, but also to aspire to and achieve senior strategic positions in their respective professional fields. Students need to innovate, to think independently, to produce new knowledge and to apply knowledge to solve increasingly complex problems.

Besides skills, knowledge and technological expertise, students also need teaching and learning approaches which enhance success in their studies, and which augment their intellectual capacity. This might assist in solving the challenges related to the shortage of expertise of highly technical, skilled and knowledgeable managers and executives. The study thus endorses and recommends the perspective of social realism that confirms the power of conceptual knowledge and places theoretical knowledge at the centre of curriculum and assessment. Such a power is ignited by inherent descriptive language which gives rise to the systematic ordering of thoughts which in turn gives rise to intellectual power and a high level of reasoning.

The greater emphasis on skills develops students horizontally for lower levels of work at production level and not for complex tasks that require high levels of thinking. While skills and technology are important, theory and principles embedded in disciplines are critical in order to move ‘knowing’ to rational objectivity in order to solve real life problems. What is more, conceptual knowledge depends on developing the power to reason, which can differentiate between a layman and a graduate. Curriculum design and assessment in different fields of study therefore should use flexible ways of

maximising students' intellectual abilities. Fields of research also need to be advanced: students need to be immersed in inquiry to access existing knowledge, and to generate further knowledge.

It is thus proposed that the different roles played by theory and practice in the curriculum and assessment should be recognised, and importantly, the objectivity of knowledge should be prioritised to maximise the development of intellectual abilities amongst graduates. For people to be able to deal with challenges presented in the real world, the development of logical reasoning is essential to access powerful knowledge. Further, for the curriculum to function optimally and to be of service to the public, the knowledge it produces must advance society in all its facets, and not only economically.

A professional relationship is formed between UoTs, industries and professional bodies to keep abreast of professional practices and rich experiences relating to practice. The researcher thus proposes that feedback obtained from the business sector relating to the type of students produced should be used in conjunction with the recognition of national plans and programmes to steer social mobility. Further proposed is the idea that, while social mobility is still experiencing many challenges, the various fields of study should consider finding flexible ways of maximising students' intellectual abilities as a commitment to social justice instead of focusing only on economic growth. Students who are holistically developed will think carefully and be able to analyse any encounter before making decisions that might hamper the lives of citizens. Such rational thinking has implications for the sustainability of resources, care and respect for humanity and promotion of social justice.

For the nation to achieve growth and social development, it is important that other knowledge types be recognised and given equal status in the transformational discourse. Furthermore, a deeply entrenched democracy with a social outlook will carefully blend theory and practical knowledge. Such an approach may stimulate intellectual freedom and power to fight social injustice by empowering students with a knowledge that gives them impetus to critique their world and the socio-economic, political and environmental issues surrounding them.

In the view of the researcher, education presented through curriculum design and assessment is a means of knowing and understanding ourselves, and a method of providing unique solutions to our immediate, unique challenges as a nation. Africa

should rise and assert itself and make use of classical contributions and best practices from the West, while also revisiting best practices of indigenous knowledge which respond to its own unique situation. It is recommended that knowledge drawn from theoretical principles and information, together with the facilitation of social engagement, will effectively raise students' levels of understanding of social issues. This will have a ripple effect, registering real change in the social morale and values of societies. The debate thus arguably lends itself to questioning whether justice is done when some types of knowledge dominate others in the curriculum.

The study finds that the best assessment strategies are case studies, discussions, briefs and projects accompanied by critical reflections and oral presentations based on content knowledge. These strategies are therefore suggested, in order to engage students and to stimulate their thinking. Assessments must differentiate the type of knowledge they assess, by indicating which specific tasks assess application of skills and which ones assess theory, so that students can access all of the knowledge types. This may further be guided by alignment to Bloom's Taxonomy when planning assessment tasks. As previously mentioned, the assessment tools confirmed to enhance learning and create a humanistic learning community while at the same time exposing students to facts are, among others, case studies, assignments, critiques, critical reflections and discussions. These tools integrate scientific facts with practical skills, and make use of questions that stimulate conversation and critical thinking. These are therefore recommended to enhance learning. Feedback in the form of guiding students on where to find answers in their textbooks after receiving their marked scripts is also recommended as a form of creating a learning community and as independent remedial action to encourage students to undertake further reading to enhance learning and performance.

6.6 RESEARCH CONTRIBUTION

The study has added to the existing body of knowledge by bringing consciousness and a reiteration to policy makers and education specialists to bring up to speed the positioning of knowledge of lasting value in the curriculum and in assessment, which is needed to build a knowledgeable and skilled society. China, Japan and South Korea have shown that there are lessons to be learned about an education that maintains high value. Another angle of consciousness that is added to the existing body of knowledge

is about broadening the education system lens, by not looking mainly at satisfying labour demands which still record a non-growing economy, high employment, and more poverty; a lens of putting human value first and freeing the mind of biases, to expand knowledge not only for its own sake, but to be brought back into the social domain to solve problems to maintain social order. This is another aspect where the study add its weight to what other researchers have contributed about the positioning of knowledge that sustains societies. The study adds further to the growing insistence about the increase of epistemic access in order to get closer to solving the challenge of scarce skills and less specialisation by a few individuals in critical areas. Clearly the broadening of access and laying the foundation to STEM subjects has to start from basic education and advance to HE. Notably, emphasis on disciplinary concepts and principles are pertinent, to contribute immensely to the development of thinking abilities needed for innovation and critical thinking in the 21st century.

6.7 RECOMMENDATIONS

6.7.1 Infrastructure

South Africa is a global partner and expectations are that it should follow the practices of its partners, which include, amongst others, recognition of internationalisation in HE. This implies that students in different UoTs across the globe should have enough facilities for them to realise their potential. The results of common projects undertaken by South African and German Electrical Engineering students alluded to in the case study have indicated that although South African students were strong in presenting theory, their German counterparts were much stronger in the technology they used, due to better infrastructure. For students to become more innovative and to be on par with their competitors, good infrastructure is needed to unlock their full potential. It is thus recommended that the infrastructure of UoTs be prioritised to cope with the demand, with the size of classes addressed in terms of student to lecturer ratio, which impacts on meaningful teaching and learning.

6.7.2 Involvement of all stakeholders before reforms are made

This study has highlighted that in most cases political concerns are made to prevail over educational and pedagogical issues. Curriculum and assessment are social phenomena that are realised under the cloud of political, social, and economic interests, which implies that all parties need to be on board. Sufficient engagements and inputs from all stakeholders are thus pertinent to creating a curriculum that satisfies the needs of all its citizens. Academics as implementers of curriculum need to be involved in the pre- and plenary discussions on curriculum matters and design. Thus, government, politicians, labour unions, and businesses should not dominate curriculum issues. Before a policy is implemented it should attract diverse inputs from various angles, particularly from academics and experts, and the use of media platforms should be used to get as many inputs as possible.

6.7.3 Epistemic access to be prioritised

While job employment contributes towards economic progress, a good education system serves as the mainstay for a better life for all citizens. Poverty and unemployment are the results of inequalities, lack of scarce skills and an education system which does not open up enough access for epistemic access. Since each UoT has a mission to cater for local and regional needs by providing knowledge and technology, the types of programmes offered by each UoT should serve the economic and social needs of different regions. Thus, UoTs should use an integrated approach to balance theory and practice in order to develop technically skilled and knowledgeable students who can apply and produce knowledge; and who can become strategic thinkers, able to apply principles derived from theory. Such an approach establishes a link with principles embraced in social realism, namely the socialness and objectivity of knowledge, which are useful elements in the holistic development of graduates. This needs conceptual knowledge to be placed at the centre of curriculum and assessment. Furthermore, routes through which career- and discipline-based curricula can respond to social needs by applying theoretical or scientific principles need to be opened.

6.7.4 Balancing the needs of society and of employers

Without the majority of society being given the opportunity to learn and enter HEIs, the social justice mission would not be realised. Social justice is encompassed in a curriculum and assessment that enable students to learn in an in-depth manner. Thus, curriculum needs to balance skills and theory so that students are developed holistically. To bring the dimension of morality and values of society, indigenous knowledge also needs to be brought into the curriculum so that well-rounded products can be developed.

6.7.5 Collaboration platforms

Change and transformation are important concepts that ensure progress as well as showing the dynamic nature of curriculum and assessment. Furthermore, change is made to keep abreast of new findings and models. However, in the midst of transformational changes with regard to curriculum and modes of assessment that can meaningfully improve learning, those who are the drivers are left behind in terms of re-skilling and knowledge acquisition to improve practice. To that effect, lecturers need to enter into expanded collaborative discourses which provide them with a platform to share their teaching and learning experiences and strategies on how to conduct assessment effectively to ensure deep learning. Furthermore, in line with the thinking that knowledge is not for itself only, but is to be used to solve problems in the social world, students from UoTs and nearby traditional and comprehensive universities as citizens of one country, also need to form meaningful forums that can be used to share knowledge and skills while also identifying community challenges, and thus come up with large-scale projects that will impact positively on their communities.

6.8 IMPLICATIONS

6.8.1 Governance level

Firstly, the widening access is in line the social justice and differentiation agenda and has the implication of giving learners the opportunity to enter HE. However, at a national level, government needs to provide structures that will sustain the initiative in the sense of providing support and allocating proper human and physical infrastructure

to match the capacity. The high number of students entering HE and the lecturer: student ratio impacts on the quality of teaching and learning and modes of assessment, which may limit the meaningful unlocking of students' cognitive abilities that will prepare them adequately to deal successfully with complex issues of the 21st century. Secondly, the widening of access has implications for the return on investment which aims at improving the socio-economic development of the country, through the kind of skills and knowledge government invests in its citizens. However, priority placed on developing skills mainly for the immediate satisfaction of employment needs has implications: this will not close the gap related to the lack of scarce skills and professional expertise that the country needs to sustain itself. STEM subjects must not be limited to only a few students and should be introduced from basic education level. In most countries where STEM subjects have been prioritised, even if economies crumble, the people have been able to cope and to use their knowledge and skills to survive through disciplinary knowledge that provided the foundation to developing their thinking abilities. Students' success is not to be defined only through skills, but should be measured by the ability to innovate. If the focus is more on skills, the implication is that students will never have access to the powerful knowledge that enables people to uphold high moral values and think logically (see Young, 2008-2013) in order contribute towards research and innovations that will sustain the socio-economic development of the country. The effect of a strong focus on building skills rather than building knowledge from a solid theoretical foundation and students' learning principles, concepts and rules, weakens the application of knowledge itself. As a result, analytical and abstract thinking skills need to be adequately developed to enable students to engage meaningfully with the world and to contribute their thoughts in different contexts. Furthermore, access to theoretical knowledge makes knowledge sustainable and encourages lifelong learning. Wally Morrow also emphasised epistemological access as an identity mark to classify academic success at a university (Morrow, 2007). This has further implications of removing the barrier to producing more graduates with analytical, strategic thinking and other cognitive abilities, who will be able climb the hierarchical employment ladder and not remain at working-class level as skilled labourers.

6.8.2 Provincial level

UoTs are regionally placed in every province for their different expertise and their missions to serve communities. Their strength is generally in applied research, technology, and skills. Yet most of the communities around them are not aware of their expertise. This implies that massive support, involvement and engagement with nearby communities need to be expanded through the planning and execution of high impact projects that can be historically recorded and showcased on different media platforms to benefit nearby community. In the engineering field, before students do their internships, their practical work should also include identifying areas of need in their respective provinces and contributing their knowledge and skills to improving the socio-economic conditions of the disadvantaged communities.

6.8.3 Local level

Stimulation and development of intellectual abilities is the hallmark of a university. Thus, regardless of which type or classification of university they have enrolled at, the role of students is to learn and develop. What they learn has to result in a difference with regard to how they do things and how they reason, which cannot be possible without extensive reading and learning of scientific principles and other formalised knowledge forms. This bring in the importance of drawing from disciplines or other systematised horizontal structures to build knowledge which can be applied in any context. The review of programmes in UoTs to increase the theoretical part of knowledge in curriculum design and modes of assessment has the implication of steering students towards different paths that match their abilities and maximise their potential.

Furthermore, when students are given activities that allow them to interact with communities to solve certain problems, such activities give them an opportunity to share ideas and to expand on their level of thinking. Such problem-solving activities have the implication of extending opportunities for them to read more in order to have informed inputs, enhance their confidence and increase their civic responsibility. Allowing students to make meaningful connections between their own everyday worlds and experience and applying concepts they have internalised is seen as meaningful learning (see Muller 2014; Beck 2014).

Epistemological access occurs in the form of critical engagement which is driven by assessment and deep reflection on content knowledge. The researcher is convinced that students should be able to engage, reason, interpret their social conditions and employ rules of nature that can help to find answers to their situations by connecting the abstract with everyday experience and this is needed in HE. Notably, Scardamalia and Bereiter (2007) support the idea of intellectual dialogue which impacts on meaningful ways of assessing in order to stimulate and promote the development of thinking abilities. Despite huge class sizes, findings have shown how some lecturers use assessment to have an impact on meaningful learning. The use of critical reflections, critiques, case studies and various forms of engaging students has yielded good results for some academics and they have the implication of not only stimulating students' thinking abilities, but also of enabling them to read broadly and to use facts to back their arguments.

Although curriculum designs are changed, reviewed, and updated, those who are driving them and conveying them to students are left behind with regard to training. In order to maintain quality teaching and learning and keep up with changes there is a need to give support to lecturers by providing extensive training so that their skills and knowledge can match the new changes that are associated with new curriculum designs. Also, meaningful ways of assessing students need lecturers to be assisted so that the impact on students can be positive; this includes effective ways of using technology.

6.9 AVENUES FOR FURTHER RESEARCH

Future research on curriculum and assessment should consider the following themes:

i. The design of a more balanced curriculum which places priority on STEM subjects, integrates theory and skills in more equitable manner and includes indigenous knowledge, but draws heavily from disciplines in subjects that allow a vertical movement.

ii. The enhancement of formative assessment strategies which create diverse opportunities for student to develop critical thinking skills.

6.10 CONCLUDING REMARKS

Having done a course work research project fifteen years ago, undertaking this major study brought the reality about lifelong learning and the importance of a layered foundation of systematic principles aligned to scientific knowledge, and gaps left due to lack of understanding of certain concepts, home to the researcher. Learning tenets of the social realism theoretical perspective brought back hope about learning not for itself but to bring knowledge and skills home in the social domain where it is badly needed to shape thoughts, solve human problems and sustain the socio-economic, cultural and political structures.

The researcher is of the view that a balanced equation, which is representative of both the socially constructed and disciplinary knowledge forms, which is the direction taken by the current reforms, may improve performance and enhance the necessary skills for the pursuit of universal truth and knowledge particularly if more STEM subjects are included in the curriculum design across different department of education systems. Also, the use of teaching and learning strategies that could enable students, even those poorly prepared by schools for university study, to learn what is taught at universities and to succeed. Therefore, the importance of teaching and assessing students well is critical (see Sambell, 2015).

Transformation and redress are thus conceptualised as going beyond issues of broadening access, representation, and the eradication of discriminatory practices, to include epistemological issues that address ideas and knowledge formulation. In other words, knowledge production and dissemination are central to the project of transformation, redress and the restoration of human dignity. Curriculum which prioritises knowledge at the centre of curriculum can create a platform to sustain a sound mix sound of philosophical principles that could prove to be effective in bringing back quality and pride, to what it means to graduate. It also alters the numbers game of celebrating quantity and certification instead of producing a thinker, a doer, a graduate with high moral values and a life-long learner. Beyond formal access to higher education, curricula must provide students with epistemic access, that is, access to better and more reliable explanations of the world and abstract ways of thinking. Knowledge from disciplines, disciplinary specialisation, and the modes of assessment that are used to develop learning are significant and key in enhancing thinking abilities. It is

especially important to note that a curriculum that does not allow epistemic access translates into a flat ontology which disregards the existence of a reality independent of our knowledge of it.

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APPENDICES

APPENDIX 1: SUPERVISOR'S LETTER

Central University of Technology, Free State

ACADEMIC DEVELOPMENT AND SUPPORT

14 March 2017

TO WHOM IT MAY CONCERN

This serves to certify that **Ms Pulane Molomo**, with student number **214072479** is registered for **PhD** programme at the Central University of Technology. Her topic of research is:

"RECONCEPTUALISING CURRICULA DESIGN AND ASSESSMENT IN UNIVERSITIES OF TECHNOLOGY"

Kindly grant her permission to conduct her interviews at your institution. She will therefore need to interview lecturers teaching: Art or Design in the faculty of Humanities; Electrical Engineering & IT lecturers in the Faculty of Engineering and Information Technology and those who are offering Radiography in the Faculty of Health Sciences at Vaal University of Technology.

The data collected will be used for educational purpose only.

I, as the supervisor, am kindly requesting that she be assisted accordingly.

Your cooperation in this regard will be highly appreciated.

Kind Regards

Supervisor:

IM Ntshoe

Scholarship for Teaching and Learning • Private Bag X20539 • Bloemfontein • SOUTH AFRICA • 9300 •
Tel: +27 051 507 3027 • Fax: +27 051 507 3699 • E-mail: imokhomo@cut.ac.za • Website: www.cut.ac.za

APPENDIX 2: ACADEMIC UNIT PERMISSION

Central University of Technology, Free State

ACADEMIC PLANNING

Mrs Pulane Molomo

Student Number: 214072479

PERMISSION FOR RESEARCH/STUDY AND ACCESS TO DATA: "RE-CONCEPTUALISING CURRICULA DESIGN AND ASSESSMENT IN UNIVERSITIES OF TECHNOLOGY: FREE STATE"

Dear Pulane Molomo

This is to confirm that you have been granted permission for research/study and access to data at the institution in connection with your registered study programme.

The conditions of the permission are:

- The survey will not interrupt any of the official activities at the institution;
- You will supply us with the copy of your report;
- The cost of all related activities will be covered by yourself;
- Recruitment of participants is the sole responsibility of yourself;
- Voluntary nature of the potential participant's decision to consent to participate should be strictly observed;
- You should not disclose a potential participant's decision to participate or otherwise to any other party;
- Permission does not compel, in any sense, participation of staff members or students in your survey.

DIRECTOR: ACADEMIC PLANNING

DR DM BALIA

13 MARCH 2014

APPENDIX 3: RESEARCH UNIT ETHICAL CLEARANCE

Central University of Technology, Free State

RESEARCH ETHICS APPROVAL

Date: 2 December 2018

This is to confirm that ethical clearance has been provided by the Faculty Research and Innovation Committee in view of the CUT Research Ethics and Integrity Framework, 2016 with reference number **[URIC 14.05.46]**

Applicant's Name	Mrs. P. A. Molomo 14072479
Supervisor Name for Student Project (where applicable)	Prof. I Ntshoe
Level of Qualification for Student Project (where applicable)	PhD: Education
Tittle of research project	RECONCEPTUALISING CURRICULA DESIGN AND ASSESSMENT IN UNIVERSITIES OF TECHNOLOGY

The following special conditions were set:

[x] Ethical measures as outlined in the LS 262a and which have been endorsed by the Faculty Research and Innovation Committee have to be adhered to.

We wish you success with your research project.

Regards

Prof JW Badenhorst
(Ethics committee representative: Research with humans)

APPENDIX 4: PERMISSION TO CONDUCT RESEARCH

Central University of Technology, Free State

INSTITUTIONAL PLANNING AND QUALITY ENHANCEMENT

MS PULANE MOLOMOTO

pmolomo@cut.ac.za

PERMISSION FOR MS PULANE MOLOMOTO CONDUCT HER RESEARCH AT THE CENTRAL UNIVERSITY OF TECHNOLOGY FOR HER PHD STUDIES ENTITLED "*RECONCEPTUALISING CURRICULA DESIGN AND ASSESSMENT IN UNIVERSITIES OF TECHNOLOGY*"

Dear Ms Pulane Molomoto

This is to confirm that you have been granted permission to conduct research at The Central University of Technology for your PhD study entitled *"Reconceptualising Curricula Design and Assessment in Universities of Technology"*

The conditions of the conditional permission are:

- The survey will not interrupt any of the official activities at the CUT;
- You will supply us with the copy of your report;
- The cost of all related activities will be covered by yourself;
- Recruitment of participants is the sole responsibility of yourself;
- Voluntary nature of the potential participant's decision to consent to participate should be strictly observed;
- You should not disclose a potential participant's decision to participate or otherwise to any other party;
- Permission does not compel, in any sense, participation of staff members or students in your survey.

ACTING DIRECTOR: INSTITUTIONAL PLANNING AND QUALITY ENHANCEMENT

Prof. A Szubarga

27 March 2018

APPENDIX 5: INTERVIEW SCHEDULE

INTERVIEW SCHEDULE

Surname and Initials: Molomo P.A
Research Topic: Reconceptualising curriculum and assessment in Universities of Technology (UoTs)

SEMI-STRUCTURED INTERVIEW SCHEDULE

My name is Pulane Molomo. I work at the Central University of Technology. I am doing a research study on Universities of Technology towards a PhD qualification at the above-mentioned institution.

This interview is expected to take 20-30 minutes. Your responses will be reported anonymously and the information required will be used solely for research purposes. You may answer the questions posed however you wish to. If you are not comfortable with the interview you are free to end it at any point.

Your cooperation will be greatly appreciated.

Are you willing to participate in the interview?

QUESTIONS FOR LECTURERS AND HoDs

i. In what ways have the past practices of technikons influenced curriculum design and assessment in UoTs?
ii. To what extent does the nature of knowledge shape curriculum design in the various fields of practice in UoTs?
iii. How do outcomes and competency shape curriculum design and assessment in the various fields of practice in UoTs?
iv. How does curriculum design of different programmes of UoTs prepare graduates to address issues of social justice and other challenges of the 21st century?

5.1 INTERVIEW SCHEDULE: (Annexture A)

Research Question	Interview Questions
1. In what ways have past practices of technikons influenced curriculum design and assessment of UoTs	I. What was the practice in technikons with regard to curriculum design and assessment? II. How did the past practices of technikons affect curriculum design and assessment in your field of practice? III. Do past practices of technikons still have a bearing on curriculum design and assessment in your field of study? IV. What are current practices of UoTs with regard to curriculum and assessment in your field of practice?
2. To what extent does the nature of knowledge shape curriculum design in the various fields of practice in UoTs?	I. Do disciplinary knowledge and skills characterise your field of practice? II. Between disciplinary knowledge and procedural knowledge, which one is mainly assessed in your field of practice? III. Is theoretical knowledge well positioned in your field of practice?
3. How do outcomes and competency shape curriculum design and assessment in the various fields of practice in UoTs?	I. When graduates complete their qualifications, do you have the confidence that they have acquired all the necessary skills required to tackle complex issues in other contexts? II. Is enough balance maintained between skills and theoretical knowledge in your field of study? III. What important role do outcomes and competencies play in the curriculum design and assessment in your field of study?

4. How does curriculum design of different programmes in UoTs prepare graduates to address issues of social justice and other challenges of the 21st century?	I. How effectively can reflective strategies be used to develop critical inquiry and involvement of students on issues of social justice? II. To what extent are issues of social justice addressed through the curriculum design and assessment in your field of study? III. How does theoretical knowledge contribute to the development of logic and analytical thinking among students? IV. To what extent does the curriculum give students an urge to critique their world or the socio-economic, political and environmental issues surrounding them?
5. In what ways may curriculum quality be enhanced in UoTs?	I. What can be improved in the curriculum in your field of practice in UoTs?

CONCLUSION

If you would like to add more information you are more than free to do so.

Thank you for your inputs and your time.

APPENDIX 6: STUDENT QUESTIONS

SEMI-STRUCTURED STUDENTS' QUESTIONS

Name and Surname: Pulane Molomo (Mrs)

Position: Lecturer

Institution: Central University of Technology.

E-mail address: pmolomo@cut.ac.za

Office tel. no: 051 507 3968

Topic: Reconceptualising curriculum design and assessment in Universities of Technology

I am doing a research study on Universities of Technology (UoTs) towards a PhD qualification at the above-mentioned institution.

QUESTIONNAIRE TO BE COMPLETED BY STUDENTS

Field of study of participants:

To be completed by students in Electrical Engineering, Art & Design, Health/Radiography, and Information & Technology students in UoTs.

PURPOSE

The questionnaire is intended to elicit information on how the syllabus in different programmes addresses different forms of knowledge and the development of analytical skills.

The information obtained may be used to observe the gaps in curriculum and assessment.

CONFIDENTIALITY:

Your responses will be reported anonymously, and the information provided will be used solely for research purposes. Only the researcher and the supervisor will have access to this information and your names will not be revealed at any point.

You are required to answer all sections as clearly and honestly as you can.

The questionnaire consists of three sections, Sections A, B and C.

Section A focuses on the personal information of respondents, Section B consists of closed-ended questions and section C consists of open-ended questions.

SECTION A: PERSONAL INFORMATION

In regard to your personal information, please mark the appropriate item with an **(X):**

1. Age group in years

17-20	21-23	24-27	28-30	Other (indicate)

2. Gender

Male	Female

3. Population group

White	Black	Coloured	Indian	Other

4. Field of study

Art and Design	Human Resources	Radiography	Electrical/Civil /Mechanical Engineering	Information Technology	Other

5. Faculty

Humanities	
Engineering and Information Technology	
Management Sciences	
Health	
Other	

6. Mark the appropriate column with a cross (X), to indicate whether you are a first-, second-, third-year or B Tech student:

First Year	Second Year	Third Year	B Tech	Other

SECTION B:

Below are statements that could relate to your experiences with regard to the syllabi/curricula in your field/discipline. Please mark with a cross (X) the most suitable answer that explains your position/experience.

7. Curriculum is expected to embrace the economic, social, environmental and political aspects of reality. Motivate your answer:

……
……
……
……
……

8. What is the relationship regarding balance between theory and practice in the syllabus of your programme/field?

Balance between theory and practice	More theory	Less theory	More practice	Less practice

9. Does curriculum in higher education prepare you to think critically? Motivate your answer:

…….

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……..

10. Does the syllabus/curriculum prepare you to address other issues that are facing communities in general, including issues of social justice? Motivate your answer.

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11. Explain how you could apply the knowledge you have gathered in your programme/discipline/field to other (different) situations?

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……..

12. Does the kind of assessment strategies used in your programme/discipline/field allow you to reflect and/or solve problems in your cultural and social experiences? Motivate your answer.

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13. Does theoretical knowledge or practical knowledge in the curriculum develop high cognitive levels of intelligence? Motivate your answer.

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14. Which area of the curriculum in your programme could be improved? Motivate your answer.

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APPENDIX 7: OBSERVATION SCHEDULE

CLASSROOM OBSERVATION SCHEDULE	OBSERVED
DATE	Yes/No
WIL: REFLECTIVE SESSION	
INTRODUCTION	
ENGAGEMENT	
PARTICIPATION	
PREPARATION	
REASONING	

TRANSRIBED LECTURERS' RESPONSES

Research Question (RQ) 1: In what ways have past practices of technikons influenced curriculum design and assessment of UoTs?	Research Question (RQ) 2: What is the nature of knowledge that shapes curriculum and assessment of your field of study?	Research Question (RQ) 3: How do outcomes and competency shape curriculum design and assessment of the various fields of studies?	Research Question (RQ) 4: How does curriculum design of different programmes/fields of study address issues of social justice and other challenges of the 21st century?
P 2 (Ind/Rad): Background: Our module assesses the readiness and preciseness for flying aeroplanes. Also assesses transportation of hazardous fuels in petrol chemicals. This involves power generation plant (ESKOM) and the possibility of using nuclear power in the future and placing it near the sea, to mitigate against its harmful impact. When curriculum was designed, the focus was on technical skills and linked to the standards and the needs of industries. Instruction highlighted focus on skills – technical skills to be focused on intensive. Work Integrated learning (WIL) was used to bridge the gap between what industry needs and what institutions of learning offer as well as building technical skills, interpersonal skills and graduate attributes. UoTs are challenged with changing technology to meet the market needs throughput. Theory is linked with the practical component. You teach the background of theory first and ideas of other researchers then go to the context. The expertise in industries are still relevant to enable students to apply knowledge technically. I When curriculum was designed in technikons the focus was on skills. There is still a gap existing between industry and universities. Studying for a specific course, has both needs of theory and practice. When getting to industry you put up with the industry technically applied knowledge and the needs of industry. It is	**P2 (Ind/Rad** I The focus is on objective scientific knowledge, and we expect students to be able to acquire high order thinking skills as we expect them to be able to analyse things, to be able to calculate and also to be knowledgeable because we work with risk assessment and material inspection. ii. What is assessed mostly is technical knowledge, to produce technically skilled graduates who will be able to work in industries, and about 80% is concentrated on technical and practical skills, but at the same time we also need content to measure competency and here about 50% of content is needed. iii Theoretical knowledge is not well placed in the centre of curriculum and assessment. It is difficult to blend theory and practice. However, the problem is solved by balancing theory and practices. Students are referred to scientific sources; books, articles etc. in the form of presentations and assignment and students are actively involved during the lecture. The balance between theory in this field is not 50/50. Students show more technical	**P 2 (Ind/Rad):** I I Outcomes are practically based in most cases. UoTs are focusing on constructive alignment between outcomes and content. But complaints have been raised by industries in relation to students who lack certain skills and cannot tackle complex issues in industries. This indicates that students need to have strong theory-based knowledge before applying knowledge. ii Issues like interpersonal skills are important. However, in some instances, higher institutions of learning deal with graduate attributes at face value, for example within a trimester a lecture is expected to develop certain attributes amongst students, and this is sometimes not possible. iii Theory and practice are components of the module, but they are not blended well. Part of the module which concentrates on destructive testing is more practical. Disciplines like physics are part of the theory where content is drawn from and students are expected to understand the laws of physics before they apply	**P2 (Ind/Rad):** **I** In relation to issues of social justice, there is a need for this field to support the transport industry to guard against aeroplane crashes. It is also important to ensure that petro-chemicals are used well to avoid bombs. There is also a need to produce experts in this field who will ensure that ESKOM is fit for purpose. It is necessary that curriculum design and assessment maintains a firm blending and alignment between theory and practice. For example, you cannot teach fluid mechanics and give a practical in magnetism.

necessary to link curricula to standards of industry, particularly technical skills. Interpersonal skills are covered by graduate attributes to improve students' confidence. Revision of the curriculum is part of the department and industries' need. UoTs are challenged with changing technology to meet the market throughput to produce engineers and designers. However, universities of technology should lead in theory to complement practice. For example, introducing nuclear physics in general, you teach the background of the theory first, then you go the context to apply the theory. ii)Technikon practices influenced some practices of UoTs to some extent. As an institute of higher learning we have a research motto and therefore we have to consider generating new knowledge. We have much knowledge to provide thus, producing a curriculum cannot be for the produce only of a market competent graduate. iii) Now it is easy to revisit our past curriculum to alter it, but the barrier could be the time the curriculum is approved by DHET. iv)Correct practices are needed to enhance curriculum design and assessment such as industrial expertise to commit committees to review needs of industries and what needs are to be researched for them to be innovative. To look at placement of students if they are fit for industry. All these will ensure whether the curriculum needs to be altered or to be changed.	strengths than theory. However, presentations and dialogue held in class give them the opportunity to research theories. Seemingly, the problem comes from high school, students seems not to have been given the proper foundation. iv Disciplinary knowledge or theory assists students to know the background behind practice, to stay connected to current practices and apply theory to this knowledge to enhance possible future research and the type of projects that are produced. Having to learn more on theory enables students to learn more about principles and rules and this improves their logical thinking.	the knowledge. When working with magnetism in this field you must have a strong knowledge of physics in magnetism. Also, when you are doing practical in ultra-sound testing you must have a sound knowledge of physics. Various methods of assessment are at play. Engaging students and having discussions about certain themes, is a preferred strategy of involving students to improve how they think. Assignments also enable students to do some research, to get diversified factual information about the topic under discussion.	**R. Question 5: In what ways can curriculum be improved**? To improve curriculum, it is important to involve industries extensively to share information about latest trends, their needs and what students lack.

(RQ 1) **P1: (Hed)**	(RQ 2) **P1:(Hed)**	(RQ 3) **P1: (Hed)**	(RQ 4) **P1: (Hed)**
I. The practice of a convenor technikon was established in 1981. The three technikons, namely CUT, TUT & CPUT, used to use the same curriculum design and assessment and TUT as the convenor technikon was responsible for the design. Advantage of convenor practice was migration or portability element. Disadvantage was the stifling of creativity and rigidity. This practice came to an end in 2009. At CUT, a strategic process of programme review took place, aiming at identifying employment trends and needs in creative industries. **ii.** In 2010, national diplomas were phased out and 11 programmes were replaced by one new diploma: Design & Studio Art with new intake in 2014. iii At first year level students do generic courses, more focused on practice and less on theory, at second year level, they choose according to the qualifications they want to follow with equal percentage of both theory and practice (50/50) whilst at postgraduate study, theory takes 60% and practice 40%. Articulation is from a National diploma, to an advanced diploma	I. Learning is assessed continuously, based on the product to be observed, and outcomes play a big role in breaking down what the syllabus needs to focus on. The type of knowledge mainly assessed depends on the focus and it differs from subjects to subject. **ii.** The main subject is visual culture and at first year level focus is more on practice than theoretical knowledge. **iii**. The impact of the practical component is good as students are given an opportunity to apply the theory they have learned and to demonstrate the mastering of that knowledge. Art students have to exhibit their work for assessment and that is where you can assess that students use theoretical knowledge to produce visible products. **iv.** In the past students never got jobs, they had skills of painters and other had to work in retail stores without using skills that were presented in their qualifications. It can thus be said that they did not have enough skills.	I The nature of subjects that are embraced in this field of study is that they have a strong practical component and it is through outcomes that students are able to produce or exhibit their products by applying knowledge and skills. ii. Graduate attributes are embedded in the outcomes that students are expected to display. The attributes are strengthened by the kind of activities that build on their personal and intellectual abilities iii. Theory is assessed on the success it has in its application to produce. The visible product produced depends on how properly the rules underpinning the theory are applied. iv. A number of strategies are used	I Reflective strategies are used as service-learning components. Students do service-learning projects. If a student needs to do a project, they need to communicate with communities and get their permission and present a project that will be of benefit to the community. Students are taught how to build so that it can be applicable to the needs of communities and also high-tech skills industries need problem solving skills. **R.Question 5;** **P2(Hed)** We need to involve industry partners in the planning process, but it is difficult because they need to be paid. The other challenge is that they are called to discuss the already designed curriculum, they advised that there is a need to use computer software so that new trends in the market can be matched by updating the curriculum. and initiating some changes on the software.
(RQ 1) **P3: (Bio)**	**(RQ 2)** **P3: (Bio)**	**(RQ 3)** P3: (Bio)	**(RQ 4)** **P3: (Bio)**

I During the technikon era a common syllabus with other technikons was used. There was collaboration and technikons depended on each other. ii. The curriculum was influenced by the needs of industries. What was happening in practice in industries determined what we teach and assess. In essence industries informed us about their needs through advisory committees and their advices were followed because students were hired by them. iii. Past practices have a bearing on UoTs' practices. Although we design what we teach and train students for the future, students' future depends on the trends out there, that are followed. We also need to be informed by industries what their needs are and plan the curriculum accordingly to embrace what the labour market needs. Also, education theories. Iv Assessment practices used depend on what you want to achieve: do you want students to have a deep understanding of theories to be applied? It is important that curriculum and assessment should talk to each other and whether the focus is on theory or practice should be spelled out. Theory lays foundational principles and it carries about 70% space in institutions of higher learning whilst in industries, practice occupies the same space.	i. This field has a strong leg in medicine and incorporates disciplines such as physics and chemistry. Theoretical knowledge plays a major role to support practice. ii. Both theoretical knowledge and practice are assessed equally. iii. Theory serves as a foundation to ground knowledge and without understanding it, it is difficult to apply knowledge. We teach theory more and bring a golden thread to infuse practice. Iv Students being equipped with enough base of theoretical knowledge are able to tackle complex challenges in their field and can independently solve problems. Students apply logical thinking when they analyse specimens. This requires students to critically engage with results, retest the findings and interpret the differences and without a solid base of theory it will be difficult to carry the task. For example, you may have two patients with the same symptoms of coughing, but there will be some differences and to be able to differentiate you need theory.	I Outcomes are important to direct what needs to be achieved. Outcomes in this module do not concentrate only on demonstrating knowledge but they lay emphasis on understanding theories in order to be able to demonstrate understanding. It is important to know and at the same time apply knowledge. As a result, assessment maintains a balance between understanding and demonstration of knowledge. The programme has some limitations at diploma level. Research is only introduced at BTech level to enable students to tackle complex problems. Use is also made of Bloom's taxonomy, especially higher levels of the taxonomy. Iii Balance is maintained between theory and practice, students do show and tell. The practical component is done in the lab but it needs to be increased. Iv Outcomes guide what needs to be taught and they help in terms of driving the curriculum and how assessment is to be done. They guide in terms of what need to be achieved.	I Critical reflection strategies are used to reflect on how curriculum has an impact on communities. Through service-learning. social justice issues are addressed. Students interact with the real world and solve problems by sharing their knowledge and being of service to the community. Students also apply technology they have learnt to advance the course of justice in communities during service learning. Service learning is accompanied by reports and debriefing about lessons learnt and what needs to be improved, and this brings in critical inquiry about strategies in use and possible ones that can improve the situation of community members. Q5: Socio-economic challenges need to be included in the curriculum and ways of finding how best communities can be uplifted by sharing knowledge with them and bringing awareness are part of the social justice agenda..

(RQ 1 **P4: (Rad)**	(RQ 2) **P4: (Rad)**	(RQ 3) **P4: (Rad)**	(RQ 4) **P4: (Rad)**
I. During the technikon era the focus was on vocational practice curricula about what students can do in the industry. Ii Most programmes were assessed in the same way and concentrated on the application of workplace skills. Iii The niche of UoTs still targets the workplace by producing skills needed in the industry. Iv One will assume that more focus will be on theoretical knowledge to enhance the scientific knowledge needed to support research projects and reach a level of complexity which is necessary to develop students' intellectual abilities.	**I** Our programme prepares students to be independent thinkers and at the same time they are prepared to do well at the workplace and apply knowledge. Ii Both theory and skills are assessed, and use is made of different assessment tools. We assess anatomy which is about 50% of theory and also assess the practical part for about the same percentage. Iii Although theory and practice are infused together, the practical component gets more attention. Students attend to the practical component twice a week in the lab and are assessed. However, without the theoretical background student would not be able to analyse, apply knowledge and solve problems.	**I P**resentations are pitched at the correct level. The pitch at first year level will differ from third year level. Students are moved from the simple to the complex tasks. Ii We struggle for students to acquire graduate attributes. Students are given a holistic picture about specific themes using technology effectively and tasks given to them allow for graduate attributes to be achieved. Team-work is encouraged, critical thinking and responsible citizenry are some of the attributes that are covered through activities students are engaged in. Iii We maintain a balance between theory and practice in our subject and we also assess these two modes of knowledge Iv Learning outcomes are used in all modules as level descriptors and curricula are in alignment with them. We are able to scaffold from first year to third year and as they progress they are able to develop analytical thinking abilities and also tackle complex problems	I Reflective practice is also used as an assessment strategy. Both peer and self-assessment are done. Lecturers are assessed by their peers and students and they also assess themselves in order to identify areas that need improvement. Ii Impact is made on communities' socio-economic challenges through a patient-care management module. Students first deal with the theory part of the module and thereafter engage with communities to raise awareness about health issues to educate them. Students reach out to both rural and urban dwellers and makes comparisons on how the health system benefits the communities. Iv To keep abreast of changes and the fast-paced life new technology is used and it assists to some extent in guarding against risks that are identified.

(RQ 1)P5: (Thet) I Technikons were created to develop technocrats and technicians. To qualify as technicians, students were assessed on skills they mastered or could demonstrate and were qualified to operate at an industry. Others were trained to work on stage as actors Whether they understood the principles behind the skills was not important as long as they could operate. WIL was used to establish a correlation between industries and universities. Ii There was an imbalance between theory and practice but currently the 5-tier diploma articulates towards a master's level. In Quizilam university in Australia there are two doctoral degrees that are offered. The one focuses on theory whilst the other one focuses on the product produced in line with the demands of industries. Theory and practice were treated separately for people to specialise either as product developers or researchers. Currently there is an interface between the two. Iv It is important to develop the whole brain by presenting different forms of knowledge to students.	**(RQ 2)** P5: (Thet) I Theory produces facts and skills are embodied in practice. It is important that both knowledge forms are taught to students. History behind products has to be presented in the form of rules and principles and knowledge be applied to produce a product. Ii Argumentative skills are developed when students are exposed to factual knowledge steadily at every level. Although argumentative skills are still not there at first year level but, they are gradually developed. Iii From third year level, students learn to interpret and at fourth year they make comparisons and evaluate their work against others.	**(RQ 3)** P5: (Thet) I Outcomes outline what students need to do, to demonstrate their understanding. They assist in breaking the work into small pieces. Through outcomes students are guided on what and how the product is to be produced. Students are thus assessed based on the outcomes and the product is observable. The interest is in in the product development. As a result Master's students do not only concentrate on new insight but focus on the product/processes.	**(RQ 4)** **P5:** (Thet) I Reflective strategies accompany service-learning activities. Reflection/critical reflection/ critique are used to explain the narrative behind the visible product that students exhibit. Students identify risks and needs of communities and help in addressing some of the needs of communities.
(RQ 1) **P6: (Co-ext)** i. Before changes were initiated, curricula of different UoTs were similar. Added to the course are SESM categories and the core outcomes. Content is developed based on the core outcomes and in alignment with assessment activities. ii. Rubrics are now used in assessment. Still following art principles and outcomes, curriculum accommodates diverse learners and assessment is done broadly and includes different components, namely assignments,	**(RQ 2)** **P6: (Co-ext)** i. Art is by nature a practical subject and students are exposed to theory through conceptualisation before practice. ii.The two components, theory and practice, feed into each other and practice carries 60% weight whilst theory takes 40%. The reason is that art is meant to be created physically. Tests based on theory are done and assignments based on research materials are done to deepen understanding.	**RQ 3)** **P6: (Co-ext)** I Students are equipped with broad conceptual theories allowing them to be able to perceive their designs and explain them in line with certain paradigms. ii.Although UoT subjects have practical inclinations, the practice is starting to change, especially from 4th year and at BTech level, to entrench theory and research. At traditional universities more emphasis is on theory which culminates in students occupying	**(RQ 4)** **P6: (Co-ext)** Reflective strategies are used as modes of assessment. Students learn theory and apply it to produce different products that are of value to the community. Students undertake projects and assignments and upon completion of them they reflect individually and in groups to assess strengths and weaknesses and how to improve. Themes like HIV/AIDS as a sustainable issue are

debates, projects, group activities, critiques and reflective practices. iii. Community development and WIL are now integrated in the curriculum. For theory subjects it was just an exam that was written, but the practice has changed. There are activities and projects that also form part of the course. **Q5.** **P6: (Co Ext)** Improvements can be done if more community engagements and partnerships can be established. Also important to consider is to see sustainability incorporated into the programme.	iii. Theoretical knowledge plays a huge role to reveal the history and theory behind artworks to enable students to look at designs critically and to solve problems because designing is about problem solving. iii. Through open-ended and higher order ranking questions students get the opportunity to improve their intellectual abilities and solve problems. iv. The impact of practical work is the strongest: students like demonstrating their work.	managerial positions whilst UoT students specialise in practical and technological skills. iii.Constructive alignment is done, and learning outcomes are closely linked with the assessment criteria. Students are assessed continuously.	incorporated into the curriculum and students bring awareness and design their projects from recycled materials. Students are also involved in community engagement and share information with communities.
(RQ 1) **P7: (Graph)** **I.** Curriculum used to be controlled by a convenor university. now individuals have the opportunity to give inputs in the design and set outcomes. Concepts were explained in Afrikaans and not all students could understand them clearly. A variety of assessment methods was not used, and remedial actions were lacking. ii. We look at the needs of industries and what students want to become and develop their entrepreneurial skills and creativity skills. The focus is on students' throughput. iii. Currently, there is more interaction between students and lecturers, and students are treated in a human way. Curriculum is moving away from a detachment between theory and practice to a close relationship between the two components.	**(RQ 2)** **P7: (Graph)** **i.** Theory is encompassed in the curriculum. Before giving students projects you need to discuss the theory first. Students also explain why they produced a certain product by giving a background and the rationale of the project. Practical work is based on theory. ii. The two components, theory and practice, are balancing as they each occupy 50% of the weight. In the new curriculum the part of theory has been increased to build upon students' critical thinking skills. iii. Drawing from graduate attributes about entrepreneurship, unemployment is addressed. Also, art is a perspective about a certain view in order to arrive at objectivity. One's project is subjected to peer review. iv.WIL is a good thing, students are assessed during their placement and given feedback.	**(RQ 3)** **P7: (Graph)** i.Learning outcomes work better when they are aligned with the assessment criteria. Outcomes play a huge role in the way students learn. In terms of specifying what needs to be learnt. ii. Graduate attributes to be attained aim at developing socially responsible and self-empowered individuals. Students when doing projects are advised to take care of the brand and become socially responsible entrepreneurs who use technology to achieve best results. Iv Case studies or briefs are used to prepare students on how to solve problems. Briefs such as taking care of the environment are used. For example, students design stamps to commemorate a fire-fighting event. A certain municipality was also revamped, and their brand name re-designed by students as part of community engagement,	**(RQ 4)** **P7: (Graph)** i. Students engage with each other about forms of art across racial lines, and they learn about other cultures and embrace diversity. iii Open discussions and debates are used as forms of assessment to enable students to think and analyse and solve problems. iii. Students get to talk about events and use technology to improve situations. Iv Everything students do and present in class has to be justified by theory. Q5 P7: (Graph) A relationship between theory and practice is to be maintained so that students can be developed holistically.

	Exposure to WIL makes it easier for students to get a job.		
(RQ 1) P8: (Int) i.At first year level there are more practical subjects than theory subjects. There was a disconnect between theory and practice. With re-curriculation more time is allocated to the theoretical component. ii. At second year level, technical design is done based on the theory learnt from built environment. **(RQ5)** **P8:(Int)** Active involvement of students in showcasing their skills and relying on theory made them produce what is of benefit to society. For example, before students start a design, they observe in industries and learn how it is done and refer to theories relating to designs.	**(RQ 2)** P8: (Int) I Theory is the backbone of the module and it informs practice. When we invite the designers and chefs who talk, they hint at theory. ii. Communication by means of drawing addresses both theory and practice. When producing artwork, you put theory into practice and work within rules. iii Everything that one applies is guided by rules and principles and when analysis is done one looks at different options.	**(RQ 3)** P8: (Int) I WIL adds quality to the kind of students that are produced. Their academic performance is developed, and their skills are enhanced further during placements. Iii Outcomes are critical. Before you start to teach you are guided by outcomes, they improve success and convey the expectations. Iv Graduate attributes play a role, but students don't see their role until they start working, for example students only realise that they should be accountable when they are working.	(R.Q 4) P8: (Int) i. During community projects and projects done with industries, students design projects that are sensitive to society needs. They design under bridges and see what they have designed has an impact on socio-economic challenges. ii. Reflection is done in the form of oral presentations whereby guest speakers are invited as mentors to talk about their success stories and to motivate students. Students at the end of each semester from 3rd year level submit reflective reports and are critiqued by their peers.
Q1 **P9: (Fash)** I During the technikon times assessment was conducted in the form of tests and examinations and only theoretical exams were written, no marks were set aside for practice. Practical elements were explained in theory. As years went by, theory occupied 60% weight and practice 40%, and students had to pass both components. As many students failed theory, more activities that make up the formative assessment were included. ii. Theory still occupies the most important part of the module, but assessment has	**Q1** **P9: (Fash)** i. Concentration is more on theory and different subjects fit well into each other. ii. Students first attend theory classes then apply theory practically. They do briefings on sustainability then they are requested to come up with a design which is sustainable to apply knowledge; both theory and practice are assessed. iii. Students are trained to be analytical, make comparisons and	**Q1** **P9: (Fash)** I There is proper balance between theory and practice. Theory is supported by textbooks, articles and four briefs for 8 weeks. The briefs are used as simulated life problems for students to solve problems. ii. In promotion of a balance between theory and practice, one lecturer did her master's on the aspect of balance and the findings were positive.	**Q1** **P9: (Fash)** I Social justice aspects are embedded in the curriculum and students attend to it through service learning and community engagement projects and some of their practical projects and briefs whereby they cater for the needs of the community. Active citizenry is also encouraged whereby students share their knowledge with

been modified to include presentations projects and group work. iii. Curriculum is aligned with assessment and the focus is on outcomes and graduate attributes.	use logic through the contribution of theoretical knowledge underpinning their module and the course is a mixture of many subjects; such as design, fine art, sculpture, printing and photography.	iii. Learning outcomes are used at different levels of the module. and curriculum is designed in alignment with learning outcomes.	communities to improve their lives
Q1 **P11: (Hrm).** I In the past, technikons worked with governing or advisory bodies. Moving into UoTs, we moved to a one size fits all curriculum which was customised in various regions. When did technikon curricula did not have a strong component of industry and used advisory boards? The education training authority had set standards for the HRM programme. ii. The programme is now driven by SABB. iii. There is more quality control in getting our students mployed.	**Q2** **P11: (Hrm).** I. HRM is more theoretical in nature, theory carries 70% of the total weight. It is a field where you need to learn more theories for practice and build experience on theories. A strong component of theory is at 2nd year level whereby students are taught the whole year about HR systems in line with the relevant technology ii. The theoretical component of the module is assessed more in the form of presentations, group assignments, investigation and reflective reports.	**Q3** **P11: (Hrm).** I Constructive alignment in relation to outcomes dictates competencies to be achieved and assessment measures competencies of students. iv. Day to day issues of HR cannot be captured in a classroom situation. They can be simulated but it is difficult to capture real situations on how people react to certain policies. We did not have the WIL component before; it has been newly introduced at third year level in the reviewed curriculum.	**Q4** **P11: (Hrm).** I We built into the curriculum current issues like HIV/AIDS, people and the planet, including social responsibility. ii. Students are given the opportunity to think critically. They are firstly given guidelines of theory and reflect on issues that are relevant in the workplace and that are challenging communities. Knowledge is built from theories that are analysed. Q5 P11: (HRM) I Students need to be exposed to more technology and labs should be increased to improve on simulation or to ultimately build an HR clinic
Q1 **P12: (Hosp)** I Theory has been more and accompanied by the practical component. ii. Curriculum has now included new subjects that are industry related that were not in the curriculum before and this is done to respond to industry needs. The subjects now include marketing, hospitality and media, and subjects that were done at 1st year level are now done at 2nd year level due to their level of	**Q2** **P12: (Hosp)** I Currently there is a good combination of theory and practice and students are developed holistically because of the need for service excellence and good interpersonal relationships with those who are served. Ii Both theory and practice are part of the formative and summative assessment and a good balance is	**Q3** **P12: (Hosp)** I Our students are preferred to others nationally because of the knowledge and skills they possess. Ii Outcomes are relied upon. The performance of students is indicated by the outcomes they are expected to demonstrate. Outcomes are also to outline what the module covers and linkages between theory and practice are maintained.	**Q4** **P12: (Hosp)** I Our students interact with grade 11 Consumer Studies learners to apply the theory they have learnt and teach them the components of the module on restaurant service. Ii Students are also given briefs that they do in groups and they submit reflective journals where they indicate how they feel about the exercise and about

complexity and the module is aligned more to industry needs than ever before. **Q5** **P12: (Hosp)** Venture into new trends and do what other universities are doing internationally.	maintained between theory and practice.		challenges and possible improvements. iii. Students do service learning for 2 months and WIL for the whole year. iii. Other components of the module include: financial management, housekeeping, front office, duty management, food and beverages and diversity management.
RQ1: P13: Som There is a balance of 50/50 allocation on both theory and practice in curriculum design and assessment, but practice relies more on theory and if you fail theory according to policy stipulations you are not allowed proceed to do the practical part of that subject or module (P 13/Som).	RQ2: P13: Som With the current programme, a component of WIL for the practical dimension starts at first year up to third year and is based on lab simulations and practice. We have constant meetings with industries to see whether we are in line with what they need. Furthermore, although principles of somatology remain the same, technology changes hence it is important to interact with industries to know the difference between machines used in industries and those that are used in universities (P13/Som).	RQ3: P13: Som To make a difference to the community we used to send students to homes for the elderly to offer our services but currently we have added community service learning as another subject to deal solely with particular communities and students are allocated marks for the contribution and knowledge they share and offer to communities during those sessions and we are guided by policies in place relating to community projects. Students are guided in terms of the expected attitude, care and sensitivity to be displayed when dealing with different groups of people and how to serve them. For example, activities to be done with elderly citizens whom students interact with in elderly homes cannot be the same as those offered to young people (P 13/Som).	With regard to Somatology, curriculum and assessment open opportunities for students to use their knowledge and skills for the benefit of communities. Students identify problems in surrounding communities and use critical inquiry to reflect on community issues and apply theory to solve problems.

Q1 **P14: (Log)** I Theory dominates in logistics and less in practice. ii Students use case studies as examples of real-life scenarios. iii. Content knowledge is well positioned. Use is made of prescribed books and relevant articles for assignments to access theoretical knowledge.	**P14: (Log)** I Students access theoretical knowledge which enables them to tackle complex problems. ii What is taught as theory is incorporated into practice and student design projects. iii. Entrepreneurship is one of the modules that puts emphasis on entrepreneurship and innovation to make students think outside the box and create job opportunities for themselves.	**Q3** **P14: (Log)** I Outcomes are important to map out what one wants to achieve, and students demonstrate the knowledge they have learnt by discussing and explaining what needs to be done. In activities students demonstrate their understanding about the themes and the knowledge they have acquired.	**Q4** **P14: (Log)** I Students use different strategies to learn and understand the work. Before a theme is tackled students are also given topics to prepare and discuss or share their understanding in class as well as discussing challenges that faces communities Ii in Business management students also discuss business ethics that are necessary in address social justice issues. Students are also developed on CSR issues on how they can conduct their business and assist communities around them.