# LECTURERS' USE OF OPEN EDUCATIONAL RESOURCES FOR TEACHER EDUCATION DELIVERY EFFECTIVENESS AT SOUTH AFRICAN UNIVERSITIES

**by**

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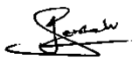
**APRIL 2022**

**In loving memory of Norman Khudu Setshedi**

**1934 - 2000**

## DECLARATION

I, Justinus Rankgakgata Setshedi, declare that this thesis, titled *Lecturers' use of Open Educational Resources in Teacher Education Faculties at South African Universities* is a true reflection of my own research and all resources used have been acknowledged.



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Signature Date

## DEDICATION

I would like to dedicate this thesis to my late father, Norman Khudu Setshedi who passed on in 2000. As my key mentor, in your own special way, you relentlessly laid a solid foundation for us, though you never had an opportunity to get an education yourself;

To my mother, Lucy Mmasebalane Setshedi, who never had an education herself but knew the value thereof and instilled in me the significance of education and perseverance in life at an early age. May God bless you;

I would like to direct my deepest appreciation to my wife, Annah Mokgaetsi Setshedi, for offering comfort during the difficult times of this journey, by believing in me and taking care of the family. Your presence in my life always brings out the best in me and thank you for being who you are. May God bless you;

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## ABSTRACT

The introduction of Open Educational Resources (OERs) has come to the fore as a solution for enriching teaching and learning practices at universities. OERs have forced many universities to adopt new ways of teaching and learning by integrating them in their teaching practices. Accordingly, this study sought to explore the use of OER by lecturers at teacher education faculties in South African Universities. However, the continued dependence by universities on printed materials like course hand-outs, despite the availability of volumes of OERs on the net, is still a cause for concern. The study concentrated on lecturers from the three public universities in South Africa, namely, the Tshwane University of Technology (TUT), University of Mpumalanga (UMP) and the University of South Africa (UNISA).

The study combined the two theories namely Siemens (2004) Connectivism learning theory and Roger's (2003) diffusion of innovation theory (DOI) to the research findings to evaluate their relevancy.

The study used an exploratory mixed-method, informed by a pragmatic paradigm, to explore the use of OERs by lecturers at selected South African Universities. The exploratory mixed-method investigation consisted of semi-structured interviews conducted with twenty-three lecturers from the three participating universities and a closed structured questionnaire drawing response from one hundred and twenty one (n=121) lecturers from the three participating South African universities. The findings from this exploratory mixed-method indicate that though the lecturers are aware of OERs and their benefits, their understanding and knowledge of OER and its use was inadequate. There is also evidence of lecturers' self-initiated use of OER principles in their daily teaching and learning practices. Most of the lecturers who participated were eager to attain training workshops that will enable them to use OER in their daily teaching and learning activities. The study revealed that lecturers' reluctance to use OER in teaching and learning was a result of three main challenges, namely, little or no understanding of OERs, inadequate access to the internet and technological tools and lack of awareness on OER licenses and copyrights. The crafted OER distribution framework proposes that the 5R principles of OER can be central in lecturers' use of OERs in teaching and learning. The little or no effectiveness of the 5R principles of OER in daily teaching and learning practices indicates the need for the review of current teaching and learning policies. The study provides recommendations for universities over and above the suggestions for future research.



**Key words: Open Educational Resources, universities, teaching and learning, OER adoption, OER Practice, lecturers, awareness creation, faculty members**

## TSHEDIMOSETSO

Kitsiso ya OERs tlisiwa jaaka tharabololo go humisa tlhaelo ya kitso le thutelatirong/ katiso mo yunibesithi. OERs e tlhagisitswe le go itsisiwe kwa diyunibesithing ka bontsi go ikamanya le mekgwathuto e meswa ya ikatiso.

Patlisiso e e kobisitswe mo batlhatlheleding ba thuto mo magorong a diyunibesithi tsa Aforikaborwa. Ka fa letlhakoreng le lengwe tlwaelo ya didiriswakgatiso di tshwana le ditokomane tsa diyunibesithi, e sa ntse e le tlhoraboroko le fa OERs di le teng mo mafaratlhatlheng a tlhaeletsano. Patlisiso e e itlameletse mo batlhatlheleding ba diyunibesithi di le tharo, e leng tsa; Thekenoloji ya Tshwane, Mpumalanga le ya Aforikaborwa.

Patlisiso e e bapisa mekgwa e tshwana le ya ga Siemens (2004) Connectivism learning theory le Rogers (2003) ya phatlhalatso ya itshimololelo (DOI) go batlisisa diphitlhelelo tsa go batlisisa bomaleba ba yona. Patlisiso e ke mokgwa o o tsenyeleditseng (a pragmatic paradigm) go dirisiwa ke batlhatlheledi ba diyunibesithi tse di tlhophilweng mo Aforikaborwa. Mokgwa o wa patlisiso o rulagantswe ka go dirisa dipotsotherisano mo batlhatlheleding ba le 23 ba diyunibesithi di le tharo tse di tsayang karolo le go rulaganya tsibogelo ya dipotsotherisano ka batlhtlheledi ba le 121 go tswa mo diyunibesithing tse di tsayang karolo mo Aforikaborwa. Diphitlhelelo di tlhagisa gore le fa batlhtlheledi ba itse ka ga OER le mesola ya yona, kitso le go tlhaloganya mokgwa o ga di a lekana.

Go bopaki jwa gore batlhtlheledi ba na le mekgwathuto e ba e itlhametseng yona ka ga OER ba e dirisa letsatsi le letsatsi le go rulaganya ditirwana.

Patlisiso e ribolola gore go ngodiega ga batlhtlheledi go tsenya OER tirisong go ruta go bakwa ke dikgwetlho -dikgolo di le tharo e leng; kitsopotlana kgotsa go tlhokakitso ka OER, tlhaelo ya inthanete le didiriswa tsa yona le botlhokakitso ka tetla/laesense ya OER.

Thulaganyo ya phatlhalatso e atlenegisa melawana e le tlhano (5Rs principles) e ka nna botlhokwa mo thuto le thutego. Tlhokego kgotsa kitsopotlana ya melawana ( 5Rs principles) mo thutong ya letsatsi le letsatsi ke sesupo sa tlhokego ya tshekatsheko ya mekgwathuto ya jaanong.

Patlisiso e e atlenegisa gore mo godimo ga mekgwathuto e e tlaa batlisisiwang mo isagong go akarediwe mekgwathuto Ono wa OER mo diyunibesithing.



**Key/senotlolo**

OER, Batlhtlheledi, diyunibesithi, thuto le thutego, ithuelo ya OER, katiso ka OER, temoso ka ga tlholego ya OER, maloko a legoro.

## LIST OF ACRONYMS

African Virtual University (AVU)

China Open Resources for Education (CORE)

Creative Commons (CC).

Department of Higher Education (DHET)

Diffusion of innovation theory (DOI),

Higher Education Institution (HEI)

Information Communication Technologies (ICT)

Intellectual Property (IP)

Kwame Nkrumah University of Technology (KNUST),

Massachusetts Institute of Technology (MIT)

Multimedia Educational Resources for Learning and Online Teaching (MERLOT)

National Programme in Technology Enhanced Learning (NPTEL)

Open Access (OA)

Open Access Institutional Repositories (OAIR)

Open CourseWare (OCW)

Open Distance Learning (ODL)

Open Educational Resources (OER)

Open Educational Practice (OEP)

Open Educational Quality Initiative (OPAL)

Open University (OU)

Post School Education and Training (PSET)

Problem-based learning (PBL)

South African Institute of Distance Education (SAIDE)

Southern African Development Community (SADEC)

Stellenbosch University

Sub-Saharan Africa (SSA)

Sustainable Development Goals (SDGs)

Teacher Education in Sub-Saharan Africa (TESSA)

Technical and Vocational Education and Training (TVET)

Tshwane University of Technology (TUT)

United Nations Educational, Scientific and Cultural Organisation (UNESCO)

United States of America (USA)

University of Cape Town (UCT),

University of Ghana (UG)

University of Mpumalanga (UMP)

University of Pretoria (UP)

University of the Free State (UFS)

University of South Africa (UNISA)

University of Western Cape (UWC),

Utah State University (USU)

Zimbabwe Open University (ZOU)

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# CHAPTER 1: THE INTRODUCTION AND OVERVIEW

## 1.1 Introduction

This study explored lecturers' use of open educational resources (OER) in teacher education faculties at selected South African Universities, seeking to understand the status of policies and models guiding their OER use, their OER conceptualisation, challenges to their use of OER and the institutional policies guiding the use of OER. The purpose of this study went beyond simply examining issues around the use of OER at selected teacher education faculties at South African Universities but utilised those issues around use of OER to formulate an OER instructional practice framework to inform the teaching and learning practice community. The focus on improving the quality of education is expected to still be the biggest challenge for Sub-Saharan Africa (SSA) in the Education for all goals (Fredriksen, Brar and Trucano, 2015:21). Hence, HEIs are challenged to tactically reposition themselves to motivate lecturers and students to develop creative and innovative ways that help them fit into this ever-changing teaching, learning and research environment (McGreal, Kinuthia and Marshall, 2013:91).

The term Open Educational Resources (OER) refers to:

"*teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. Open licensing is built within the existing framework of intellectual property rights as defined by relevant international conventions and respects authorship of the work. OERs include course materials, textbooks, podcasts, and other materials available freely online particularly designed to facilitate learning"* (UNESCO, 2012:01; Nikoi & Armellini, 2012:166).

Nikoi and Armellini (2012:166) further indicate that OERs cover an extensive range of learning objects which include references and readings, simulations, experiments, demonstrations, curricula, and guides. Bansal, Chabra & Joshi (2013: 06) assert that a major characteristic of OER is the sharing of printable materials kept in digital format and multimedia format. The entire OER movement was able to successfully encourage ambitions of organisations and individuals to publish OER by successfully promoting the idea that knowledge is a public good (Ehlers, 2011:02).

OER are materials kept in digital format and in multimedia format and are able to be easily used, reused and adapted to support teaching and learning (McGreal 2012:679). They are

opportunities for strengthening teaching, learning and research and can be shared as printable materials. OER, which are freely available teaching and learning resources on the net, are observed as powerful techniques in teaching and learning in all levels of education because they substitute basic tools like print-textbooks and other learning materials. OERs incorporate textbooks, lecture materials, podcasts, and any other teaching and learning materials which are available freely available online that are designed to enhance teaching and learning UNESCO (2012:01). For the purpose of this study, OER refers to the range of activities employed in reusing, adapting and redistributing OER so as to integrate them into one's teaching and learning approaches. The use of OER is materialises when course materials, textbooks and any other materials are freely available on the public domain and have open licenses and their uptake is permitted. The use of OER introduces undertakings in which teaching and learning materials are permitted to be revised or remixed into new materials.

The aim of this chapter is to provide an overview of the study. The problem statement, research questions, study purpose, study significance, motivation underpinning the study being done, and ethical considerations are discussed below:

### 1.2 Background to the study

In 2001, the Massachusetts Institute of Technology (MIT) was the first in the world to make its courses available on the net with the aim of sharing courses with the public for free (Zhu, 2020:258). The presentation of the MIT Open Courseware model at the 2002 UNESCO meeting assisted in coining OER as the concept of making educational materials available free of charge on the net (Nkuyubwatsi, 2018:1). The project is designed to provide undergraduate and graduate courses with video lectures, syllabi, reading lists, course calendars, exam and quiz questions and answers and contains free lecture notes (Onaifo, 2016:3).The MIT initiative was the one of the frontrunners to deliver courses through the use of an open license (Wright, 2018:24). Subsequently, initiatives like OpenCourseWare Consortium and Open Education Consortium, which were associated with large HEIs, were instituted in order to support the OER movement by creating and sharing content (Loglo & Zawacki-Richter, 2019:19). In 2008, representatives from universities in 39 countries gathered at the Open CourseWare Consortium Conference held in China. That conference was purposefully held to report on the progress, and share experiences in regard to the opening up of access to course materials (OpenCourseWare Consortium, 2010:n.p.). The OpenCourseWare Consortium is made up of universities from those countries. The focus is on establishing a network of global universities in order to publish and openly share course materials (ibid, 2010n.p). Surpassing the confines of the United States of America, many more

countries also introduced OER to the higher education sector (UNESCO, 2015:12-13). China joined MIT to offer educational resources to her universities through China Open Resources for Education (CORE) project in 2002. The Khan Academy also initiated support to educational institutions by offering them free educational videos (Butcher & Moore, 2015:37).

The establishment of OER triggered two important international declarations to support its proliferation (Onaifo, 2016:5). In 2007, the Open Society Institute (OSI) and the Shuttleworth Foundation organised a meeting attended by thirty leading proponents of open education. They summoned to agree on a manifesto on the support and funding of OER (Wiley, 2014 n.p). The outcome of the meeting, the Cape Town Open Education Declaration, was released on 22 January 2008 (ibid, 2014 n.p). The meeting was aimed at agreeing on strategies for OER collaborators to increase and intensify global OER initiatives. The OER community implored librarians and educators to "commit to actively bring students and early career educators into the movement as users, advocates, and creators of OER" Cape Town Open Education Declaration (2017:6). Allen and Seaman (2014:15) noted that there has been a remarkable intensification of OER awareness between the years 2012 and 2016 at many educational institutions across the world.

In 2012, UNESCO anchored the World Open Educational Resources Congress which led to the approval of the Paris OER Declaration (Arinto, Hodgkinson-Williams, King, Cartmill & Willmers, 2017:10). The Paris OER Declaration officially stipulates that states should openly license publicly funded educational materials (UNESCO, 2012). The Declaration calls on governments to encourage awareness and the use of OER in order to accelerate the reduction of OER barriers and opening up educational access, reduce educational cost, reduce teacher burn-out and improve sharing of high quality educational resources to enhance quality teaching and learning (Karunanayaka, 2021:4).

South African universities are characterised by little or no initiatives to openly share their teaching and learning resources freely on the net (ROER4D, 2017:4). In 2007, Siyavula, which is an education technology company and OER publisher, became the first South African OER initiative to release open textbooks and other materials under Creative Commons licences (Goodier, 2017:242). These open textbooks and other materials are made freely available to be printed and adapted according to the user's needs (ibid, 2017:242).

With respect to the African context, organisations like OER Africa and numerous HEIs have been developing the use and production of OER and OCW (Lesko, 2013:121). This is in line with the Paris declaration indicating that educational resources developed with public funds should be made freely accessible to everyone. OER Africa as a regional initiative has been

essential in developing the OER community (van Wyk, 2012:21). Nikoi & Armellini (2012:167) alludes that OER Africa has been committed to the sharing and adapting of OER to reach African health, agriculture and teacher education communities. OER Africa is involved in projects like the SAIDE ACEMaths project testing the selection, adaptation and use of OER materials on the teaching and learning of mathematics teacher education (Butcher, 2015:80). OER Africa is also dispensing continuous guidance to African countries with regard to licensing issues (Lesko, 2013:121).

The South African Government could be reaping the potential benefits of OER like many African countries are doing, but because of scarce higher education resources, lack of infrastructural and technological penetration, there is little knowledge on the value of OER (Lesko, 2013:121). South African universities are characterised by little or no initiatives to share openly their teaching and learning resources freely on the net (ROER4D, 2017:4). As said before, in 2007, Siyavula became the first South African OER initiative to release open textbooks and other materials under Creative Commons licences (Goodier, 2017:242). These open textbooks and other materials are made freely available to be printed and adapted according to the user's needs (ibid, 2017:242). Another project called The Teacher Education in Sub Saharan Africa (TESSA) which is a collaboratory initiative between the Open University UK and thirteen African institutions has developed OER for teacher training in four languages: English, Kiswahili, Arabic and French (Kanwar, 2013:5). Drawing from the foregoing, the OERs are already in the teaching and learning landscape in other African countries. In addition, OERs have the potential to enable these other African institutions to adopt new paradigms.

Despite the strides taken in coming up with organisations like OER Africa to support OER initiatives, African countries including South Africa are still reluctant in taking full advantage of the new teaching and learning approaches promised by the integration of OERs. South Africa faces the challenge of students having no access to school or community libraries and computers, and in some cases there is a lack of basic facilities such as running water, electricity, ablution services, desks and chairs (Bharuthram & Kies, 2012:3). The increasing participation in higher education has exacerbated the latter challenges. South Africa has seen an increase in its higher educational enrolments whilst higher education institutions (HEIs) resources have remained limited. A related research study by Calitz (2015) revealed that students at higher education institutions demonstrated, *inter alia,* concerns about the quality of teaching and learning, their relationships with lecturers, conditions at residences, lack of resources, and unequal access to extracurricular opportunities.

One of South Africa's greatest challenges is providing quality education and also ensuring that it is world-of-work orientated. This means that teaching and learning practices need to be updated in accordance with global technological trends influencing the provision of education. Difficult access to technology remains the utmost obstacle to the alignment of teaching and learning practices, especially given the sharp increase of student numbers, in relation to the available infrastructure, and the lack of learning resources. In short, South Africa, like all developing countries, is expected to develop the kind of Higher Education that will enable the development of an information society capable of unlocking its research potential and skills development.

Higher Education institutions are beginning to look for other solutions in enriching their teaching and learning practices. These intervention processes are designed to respond to systemic challenges to higher education, especially the challenge of developing an information society. For example, challenges to the massification of higher education have been identified in the attempt to address the need for larger lecture rooms. Trends like the introduction of OER in teaching and learning have come to the fore as a solution for developing the information society. Also, thus far, more emphasis in containing the increased number of students at HEIs has been laid on the introduction of OER. A lack of resources does not only constrain the ability of individual students to cover tuition costs but also hampers the institutions' commitment to assist poor students (Calitz, 2015:12)

OERs are becoming a common technology enabled delivery tool for teaching and learning in many educational institutions. The United States, the United Kingdom and New Zealand have national government frameworks for open access and licensing, unlike many developing countries that are yet to increase access to education and training opportunities for all through the provision of an OER framework. Many developing countries lack the necessary resources to provide adequate access to learning materials in their education systems (Fredriksen, Brar & Trucano, and 2015:11). Furthermore, developing country capacities to participate in the global information society mainly depend on learning material access enablers, which in turn determine the use of OER by HEIs. Some HEIs do not consider OERs to be teaching and learning materials, whereas other institutions are willing to integrate them into their curriculum (Allen & Seaman, 2011:24). The reluctance of some HEIs to the use OER may be due to a lack of awareness on the use of OER.

Because the availability of quality teaching and learning materials has become a major concern in many countries, OER policies and strategies have seen some development. Many global HEIs have as a result, adapted to new ways of teaching and learning which include the

integration of OER in teaching. However, in most developing countries, like those of sub-Saharan Africa, the use of OERs has been compromised due partly to a lack of an OER framework. Having an OER framework in place ensures high quality teaching resources which may contribute to the development of quality teaching and learning materials for improved academic achievements (Ipaye & Ipaye, 2013:05).

Judging by the latest developments in the field, Karak (2016:99) posits that OERs are increasing the likelihood of greatly changing educational practices in higher education. Several OER projects have been initiated, including OER Africa, African Virtual University (AVU), South African Institute of Distance Education (SAIDE) and Teacher Education in Sub-Saharan Africa (TESSA). These projects were initiated to promote the use of the OER strategy to better educational practices at HEIs (Wright & Reju, 2012:181). Recent studies show that African HEIs like the University of Ghana (UG), the Kwame Nkrumah University of Technology (KNUST), the University of Western Cape (UWC), University of Cape Town (UCT), the University of South Africa (UNISA), the Stellenbosch University and the University of Pretoria (UP) are already having OER repositories that support OER use by lecturers (Cox, 2016:51). In a survey on OER use, conducted by Ngengebule and Nonyongo (2013:5) in Ghana and Zambia, the need for greater institutional participation, broader community and national awareness campaigns to promote usage and benefits of, and also to showcase some of the important initiatives, were highlighted. In addition the survey indicated that the participants were not aware of the existence of a formal OER policy in their countries (ibid, 2013:6). According to a study conducted by Mtebe and Raisamo (2014) in eleven (11) universities in Tanzania, the following barriers hinder the use OERs by lecturers: slow internet connection, lack of OER supportive policies, lack of training and practice and lack of computer hardware and software.

Although South Africa has seen some recent public policy developments in its higher education sector, it is yet to have a national or institutional policy that authorises open licensing of educational materials produced with public funds (Hoosen & Butcher 2019:22). There are two policy developments on higher education in South Africa, the 2013 White Paper for Post School Education and Training (PSET) System and the 2017 Open Learning Policy Framework for South African Post-school Education and Training. The 2013 White Paper for Post School Education and Training (PSET) System only mentions the integration of OER into mainstream education and the 2017 Open Learning Policy Framework for South African Post-school Education and Training only indicates OER as the current international teaching and learning trend.

There have been OER policy support efforts from individual universities in South Africa. In 2005, the University of Western Cape developed the Free and Open Educational Resources (F/OER) which was aimed at engaging in both the creation and use of F/OER in teaching and learning (Keats, 2009:51). Since then, the University of Witwatersrand (WITS) developed an OER policy called An enabling strategy for Free and Open Educational Resources in 2011 while the University of South Africa (UNISA) launched an UNISA OER Strategy in 2012 (Chikuni, Cox & Czerniewicz, 2019:167). The University of Cape Town (UCT) also formulated and launched the UCT Open Access Policy in 2014, while the Nelson Mandela University (NMU) produced a draft form of Open Access Policy. Similarly, the North West University (NWU) approved the North West University Open Educational Resources Declaration (ibid, 2019:167).

A study carried out at the University of the Free State (UFS) by Madiba (2018) on lecturers' perceptions of the integration of OER in teaching and learning, showed that a lack of awareness persists among lecturers. The study found that lecturers and not fully aware of what OERs are or how they can be integrated into teaching and learning. Most lecturers who do not use OER do not have the requisite skills to integrate OER in their teaching (Johnson, Adams-Becker*,* Cummins, Estrada, Freeman & Ludgate*,* 2013:10).

A review of literature by early researchers (de Hart & Oosthuizen, 2012; Percy & Van Belle, 2012; van der Merwe, 2013; Lesko, 2013; de Hart, Shetty & Archer, 2015; Cox and Trotter, 2017; Mays, 2016) has specifically shown that teaching in South African universities is far from being influenced by lecturers' use of OER. The review also shows that the lack of OER institutional policies and frameworks is one of the challenges hindering the use of OER in teaching practice at South African universities. Currently, few studies have been done specifically to find out teacher education faculty lecturer's experiences on the use and adaptation of OER in support of access and social justice issues for students in South Africa. As such, this study is intended to explore teacher education faculty lecturer's use of OER at selected South African universities.

### 1.3 Problem statement

Despite the fact that the use of technology is a norm for the current crop of students, more still needs to be done in the integration of technology in teaching and learning (Van Jaarsveld & Van der Walt, 2018:25). This signifies that technology has become a fundamental part of educational programmes and provides vast possibilities to magnify learning (Dube, Nhamo & Magonde: 2018; Taimalu & Luik, 2019). However, Madiba (2018:158) observed that lecturers are yet to be convinced to move from deep-rooted thinking of associating quality teaching and

learning with copyrighted educational materials. Moreover, Oke & Fernandes (2020:2) agrees that the use of technology has mainly been restricted to the didactic approach of teaching and learning, through which teaching is enabled by the use of a personal computer and the provision of electronic teaching materials. OERs as part of the electronic teaching materials, go beyond being referred to as digital materials to encompass digital teaching and learning that is freely available and openly licensed for sharing, re-use and adaptation to meet an individual need (Sabadie, Muñoz, Puni, Redecker & Vuorikari, 2014:1).

Notwithstanding the good intentions behind OERs, lecturers are often confronted with numerous challenges in tackling OER (Butcher & Moore, 2015:13). Belikov & Bodily (2016:235) observe that in spite of the cost and potential pedagogical benefits, some lecturers are still cautious about the quality of OER. Lecturers hesitate to incorporate educational resources as they assume that OERs are often created by those who lack content expertise (Raneri & Young, 2016:582). In addition, Madiba (2018:76) suggest that some lecturers regard these OERs as having lesser value as a backbone of their modules.

However, a number of lecturers sporadically used OERs inadvertently prior to their awareness of the concept, often by employing Wikipedia or YouTube (Cox & Trotter (2017:334). Davis, Carr, Hey, Howard, Millard, Morris & White (2010:103) also note that many lecturers have the habit of not sharing their materials beyond a small, known community because they "lack confidence in the applicability of the resource". The present study seeks to address this gap with regard to the lecturers' use of open educational resources in teacher education faculties at South African universities.

Bossu & Willemse (2017:1) declares that while the emphasis of OER in the higher educator sector is on strengthening student access and learning, lectures in particular, still lack the necessary further professional development and capacity building, including learning, teaching and research, to make it work. Despite their slow adoption by lecturers, the value of OERs goes beyond just being available at low cost. In fact, they also offer the potential to adapt educational resources to meet the specific student needs and learning objectives (Hassler, Hennessy & Knight, 2014:6). The adaptation of OERs will require that lecturers use their Information, Communication and Technology (ICT) skills for professional development (Perryman, 2013:4).

### 1.4 The purpose of the study

The purpose of the study is to develop an OER Distribution framework that would empower lecturers in their use of OERs to impact teacher education delivery effectiveness. The study

examined key issues in the use of OER by lecturers at South African universities. OERs are those teaching and learning materials that are available either in the public domain or under an open licence (Butcher, et al.,, 2015:8). There is a growing body of knowledge indicating the use of OER in teaching and learning (Nikoi, et al., 2012; Commonwealth of Learning, 2011; Mtebe, et al., 2014). Karipi (2020) and Madiba (2018) are some of the Southern African Development Community (SADEC)'s scholars who demonstrated through their studies the gaps that can be filled in teaching and learning through the adoption of OERs. Although the past two decades have seen the availability of volumes of OERs on the net, the use of OERs in teaching and learning is still not expected levels. The shortage or lack of OER understanding results from the paucity of research on South African lecturers' adoption of OER (Cox, et al., 2017:152).

Although OERs have been touted as the having potential to enhance teaching and learning, there is a need for more concerted efforts to shed light on the fundamental issues affecting the use of OERs in teaching and learning, particularly at South African universities. Such efforts by this study will enhance the effective use of OER as the study findings will be shared with the participating universities and the Department of Higher Education and Training (DHET) in order to influence the development of a national OER policy for teaching and learning. The study responds to the lack of research studies describing and analysing the lecturers' use of OER for teacher education delivery effectiveness at South African universities in order to create an OER diffusion framework as a solution.

### 1.5 Significance of the study

Given the importance of OERs in teaching and learning for South African universities in general, it is crucial that attention be paid to the realignment of HEI curricula with current, 21st century competency needs. Therefore, in this study, lecturers' OER usage experiences, at selected South African universities, were studied. The study of these lecturer OER use experiences will help reveal lecturers understanding and perception of OERs. The study was also used to assist lecturers identify OERs from other resources in order to use them in teaching and learning. Furthermore, the study adds value to lecturing by helping ensure that education programmes are relevant and compatible in this challenging society (Wasserman, Quint, Norris & Carr, 2017).

The freely availability of teaching and learning resources on the net has the potential to improve teaching quality, which can in turn lead to improvements in student learning and academic performance. However, some lecturers are reluctant to use educational resources that are accessible through the web due to a lack of knowledge about their source of origin

and fear of using low quality resources (Mtebe, et al., 2014:249). The reluctance to use OER in teaching and learning is not only confined to South Africa alone but exists in most developing countries. Globally, there is an increasing need for inventive forms of support the development and evaluation of OERs, over and above the developing empirical research on the successes of OERs (Hassler, Hennessy,Knight & Connolly, 2014:6).

South Africa, through policies such as the White Paper for PSET System (DHET, 2013), has created space for OERs to supplement campus-based education delivery through the entire PSET system (Baijnath, 2018:92). Despite the existence of this policy, and the fact that South African universities have relatively good Internet services, there is little evidence of maximum utilisation of OERs in curriculum design (Czerniewicz, Deacon, Small & Walji, 2014:124).

In the South Africa context, lecturers are expected to also avail their lecture notes openly on the net for free use (Kanwar, Kodhandaraman & Umar, 2010:67). The insight from Kanwar et al, (2010:67), on linking OER movement with availing of lecture notes freely on the net, is crucial for providing quality education. Lecturers are also required to be conversant with the open copyright licence or Creative Commons (CC). Orr, Rimini and Van Damme (2015:15) confirm that OER has unique, distinctive characteristics. These include the open copyright licence or Creative Commons which allows their resources to be placed in the public domain for ease of access and modification.

The findings of the study will therefore help to highlight the importance of orientating lecturers to the OER's open copyright licence or CC to HEIs. Butcher, et al., (2015:13) assert that lecturers admit to not being informed of OERs, especially with regard to searching, accessing and, worst of all, integrating them into teaching and learning. It is suggested to lecturers to source, adopt and adapt OER in their teaching and learning. The findings of the study also reveal lecturers' OER use experiences at the coalface of implementation, and the implications thence in order to effect policies on teaching and learning. However, research on the lecturer's use of OER at teacher education faculties of selected South African Universities is limited. Thus, the study sheds light on the lecturers' experiences in the use of OER in selected South African universities. It contributes to the body of knowledge on the use of OER at universities and can inspire further research. The results of the study will enable the researcher to construct a new OER distribution framework that can be used to guide improvement in the quality of teaching and learning practice.

### 1.6 Research questions

#### Main research question

In view of addressing the research problem of this study, the following was the main research question:

**How do lecturers use OERs at teacher education faculties in South African Universities?**

### Sub-research questions

The following sub-research questions were derived from the main research question:

- How do lecturers at teacher education faculties in South African universities conceptualise OER as educational resources?
- Which policies guide the use of OER as educational resources in teacher education faculties in South African universities?
- What are the challenges faced by lecturers at teacher education faculties in South African universities in the use of OER as educational resources in teaching and learning?
- What scholarly publications and the findings of this study could be used to develop an OER distribution framework that will guide lecturers' use of OER as educational resources in teaching and learning at teacher education faculties in South African universities?

### 1.7 Aims and objectives of the study

#### Aim of the study

**To design and describe a proposed OER distribution framework for teaching and learning policy change in view of lecturers' use of OERs for more effective teacher education delivery**

**Objectives of the study**

To achieve the above overall aim of this study, the following specific objectives were formulated:

- To investigate policies guiding the use of OER at teacher education faculties in South African universities.
- To explore how OER is conceptualised by lecturers at teacher education faculties in South African universities.
- To research the challenges faced in the use of OER in teaching and learning by lecturers at teacher education faculties in South African universities.
- To develop an OER distribution framework based on scholarly publications and findings of this study that will guide lecturers' use of OER as educational resources in teaching and learning at teacher education faculties in South African universities.

**1.8 The Importance of pedagogical theories in the use of OER**

According to Ngulube (2019:5), a theory more than any other reason, must be used for its descriptive, relational, or explanatory value. While deliberating on theory, Ngulube (2019:48) states that theory cannot be separated from research, and that conducting a study in the absence of either a conceptual or theoretical framework is impossible. Explanatory or descriptive theories usually explain the elements influencing on a phenomenon, such as a given human behaviour (Hew, Foon, Lan, Tang, Jia, & Lo, 2019:959). The use of theory in research writing is imperative because it describes the correlation among the concepts (Ukwoma & Ngulube, 2021:48). This implies that the use of theories in teaching and learning provides useful instruments for the interpretation of data and averts the disintegration of knowledge by ordering, putting emphasis on the inquiry and producing theoretical explanations and perceptions of what is being investigated (Ngulube et al., 2015:52).

**1.8. Theories underpinning this study**

This section establishes the two theories which guided the study. The following chapter presents a detailed description of the theoretical framework underpinning this study. This study reviewed two theories that support the use of OER in teaching and learning and have been considered suitable to underpin this study. The theories are the connectivism (Siemens, 2004)

and diffusion of innovation (DOI) model (Rogers, 2003) constitute the theoretical framework for this study in order to understand the extent of use of OER in teaching and learning at South African universities. DOI is a theory that is frequently used in information systems.

Connectivism is “a learning theory for the digital age” (Siemens, 2004:1), and an emphasis of the theory is that learning exist externally in the world augmented by technology. Learning is a process that that takes outside the confines of the individual but within indistinct environments of shifting core elements (Siemens 2004b:5). Also, connectivism as learning theory accepting the digital era, suggests that knowledge and understanding occurs within a shifting personal network (Siemens 2005:7). Connectivism is an attempt to offer an understanding of how both students and organisations learn (Al-Shehri, 2011:15). Connectivism theory is a theoretical stance that emphasizes how technology impacts the learning process in the current digital age (Abdullah, 2021:81). One key feature of connectivism is the use of a network with nodes and connections to enable teaching and learning. “Connectivism also assumes that information is plentiful and that the learner’s role is not to memorize or even understand everything, but to have the capacity to find and apply knowledge when and where it is needed.” (Anderson & Dron, 2011:87). Connectivism as a learning theory provides a theoretical framework that the research to answer the research questions.

Another theory explored by this study is Roger’s diffusion of innovation theory (DOI) is effected to assist in providing an understanding of the lecturers of HEIs regarding use of OER in teaching and learning at South African universities. Diffusion is “a process in which an innovation is communicated through certain channels over time amongst members of a social system.” (Rogers.2003:5). He further describe an innovation as an idea, practice or object considered as new by an individual or other unit of adoption (ibid,2003:11). Additionally, this model assist in the unravelling activities in which the use of OER is spread within the HEIs. Rogers (2003) provides this study with the identification of several features of innovations having a bearing on the lecturer’s decision whether to accept or reject the use of OER in their teaching practice. This study is of the belief that there is need for integration of the use of OER in teaching and learning through the digital platforms within the HEIs. Rogers’ diffusion of innovation theory suggests the five adopter stages through which an innovation passes before an individual takes it into use :(1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards (Rogers, 2003:22).

South Africa like many developing countries is still grappling with the new concept of OER movement. Several scholars (Mtebe, et al., 2014; Percy & Van Belle, 2012) conceded that in

the face of these volumes of OERs, their acquisition in African countries like Ghana, Malawi, Tanzania and Zimbabwe is still below expectations. Most of the higher education institutions are still relying on print-dependent educational practices which includes paper textbooks and course hand-outs (Mtebe, et al., 2014:44). However, there is evidence of some OER initiatives in some African countries. Organisations such as BBC World Serivice Trust, the South African Institute for Distance Education (SAIDE) and the Commonwealth of Learning are part of TESSA global consortium focused on teacher education needs in Africa (Adala, 2016:29). TESSA OER comprises of a core set of 75 study units in Science, Literacy, Mathematics, Social Studies and the Arts, and Life skills (Wolfenden, Umar, Aguti and Gafar, 2010:2).

The following Figure 1 illustrates theories underpinning the study which are elaborated in chapter 2:


*Figure 1. 1: Theories underpinning the study*

The researcher borrowed from Connectivism learning theory and Rogers' diffusion of innovation theory to develop an OER Distribution Model to foreground and support the use of OER as digital pedagogical technology in enhancing teaching and learning.

### 1.9 Delimitations of the study

This section identifies limitations the study is likely to encounter. The researcher was challenged by financial and time constraints and had to subsequently limit the study to lecturers at two universities from Gauteng province and one from Mpumalanga. The researcher is located in Gauteng province and it was feasible for him to effectively conduct the study within the province without being hindered by financial constraints.

A further limitation for this study was time, as this study was conducted within a limited time, during the Covid-19 state of national disaster in South Africa. Participants of this study were limited to those lecturers who were part of the HEIs during the time of the study. The findings of this study will therefore not be replicable to lecturers outside the scope of this study as they might have different views.

### 1.10 Research paradigm

Bhattacherjee (2012:17) defines a research paradigm as a belief system that shapes conduct of research in order to arrange researcher's reasoning and observations. In other words, a paradigm serves as an enabler for researchers to see new ways of viewing and explaining things (Babbie, 2010:33). Major paradigms generally used in research include positivism, post-positivism, interpretivism and pragmatism (Sefotho, 2015:26). The researcher employed the pragmatism paradigm in order to explore how lecturers use OER at teacher education faculties in South African Universities. The pragmatism paradigm suited this study because it allows the researcher to interpret the responses of respondents (reliability) quantitatively and the views of the participants (trustworthiness) qualitatively and to triangulate them with scholarly publications (Ibid, 2015:28).

This study was positioned within the pragmatic paradigm to explore use of OER by lecturers at selected South African Universities (cf.4.4.2). The pragmatic paradigm assisted in facilitating exploration of the use of OER as perceived by lecturers in their natural setting.

Pragmatist researchers prefer working with the combination of both quantitative and qualitative data since it enables them to better realise social reality (Wahyuni, 2012:71). Secondly, in contrast to the positivist paradigm which sees the researcher as an external observer who controls the research process, the pragmatic paradigm used in this study helps to understand the views of the lecturers within their own natural environment which cannot be examined partially.

### 1.11 Research design and methodology

The aim of this study was to interact with lecturers in order to capture their experiences in the usage of OER at teacher education faculties in South African Universities. Additionally, this study aimed to utilise the captured perspectives and understanding of the lecturers on the use of OER in their teaching and learning and to propose an OER instructional framework to guide the use of OER by the HEIs.

Consequently, in compliance with a pragmatic paradigm, this study followed an exploratory mixed-method approach, as it enabled the exploration of lecturer's use of OER at teacher education faculties in South African Universities. Pragmatist researchers prefer using both the quantitative and qualitative data as it better allows them to advance social reality (Wahyuni, 2012:71). According to de Vos, Strydom, Fouche, and Delport (2011:441), the exploratory mixed method is used when the researcher initiates the research process by first investigating the phenomenon using qualitative data before embarking on measuring the phenomenon quantitatively. Creswell (2014:226) also alludes that an exploratory mixed-method approach assists to gain insight into the research problem by developing measurements from specific samples of the population and using the data from the few participants of the population to generalise to a large sample of the population.

Furthermore, Creswell (2014:226) pointed out that the researcher initially begins by exploring the research problem with qualitative data and analysis and then utilises the findings in the quantitative phase. The assumption of the researcher suggested that the participants being studied have direct exposure to the activities and realities of the situation, on that account the knowledge inhabiting their views. The utilisation of an exploratory mixed-method approach in this study is compatible with the pragmatic perspective used in this study. An exploratory mixed-method approach assisted the researcher to gain insight into the research problem by developing measurements from specific samples of the population. The study then used the data from the few participants of the population to generalise to a large sample of the population (Creswell, 2014:226). An exploratory mixed-method approach thus permitted the researcher a chance to analyse lecturers' views on the use of OER at teacher education

faculties in South African Universities. The combination of quantitative and qualitative methods was considered relevant for this study to identify lecturers from diverse backgrounds within an HEI, in order to draw various views to reinforce the research.

The advantage of mixed method approach is that of assisting the researcher with the strength to neutralise the weaknesses of both quantitative and qualitative research, thereby permitting better deduction to the study (de Vos et al., 2011:427).The exploratory mixed methods design, is used when a researcher first needs to explore a phenomenon using qualitative data before attempting to measure or test it quantitatively (ibid, 2011:441). This study found exploratory mixed methods design relevant as the researcher is enabled to build a quantitative study on the results of a qualitative study (Van Wyk &Taole, 2015:182). In this study the qualitative strand was considered exploratory, to be followed by further testing and verification during the quantitative data analysis phase (ibid, 2015:182).

### 1.11.1 Population and sampling

Sequential sampling, aims to collect sample and data until the amount of new data or the variety of cases is completed, particularly until the saturation point is reached (de Vos et al, 2011:393). For the purpose of this study, purposive sampling was used to select the participants. Purposive sampling is pertinent when the researcher aims to select a sample based on his/her knowledge of the population, its components and the purpose of the study (Babbie, 2010:193). The researcher having been a lecturer himself knew the intended participants, given the relevance of this element to the study. The research participants will be chosen because they have basic knowledge of OER and are involved in the daily teaching practices.

The first sample for the qualitative phase of this study was drawn from faculties of education at the Tshwane University of Technology (TUT), University of Mpumalanga (UMP) and the University of South Africa (UNISA) currently using OER in their teaching. The twenty-three lecturers drawn as participants were expected to have experience of teaching, and using OER in their teaching. Purposive sampling assisted the researcher to select participants for a qualitative project whereby participants were to assist in informing the central phenomenon in the study were recruited**.** Further, participants were engaged in an interview process that involved follow-up interviews (where necessary) through which the researcher gained access to a particular perspective on the phenomenon under investigation.

The second sample for the quantitative phase of this study was also drawn from the three selected South African universities. The probability sampling was used in that closed structured questionnaire, was designed and emailed to participants for data collection. The

questionnaire was emailed to three selected universities for completion. Two hundred (n=200) lecturers from the three selected teacher education faculties/colleges were targeted to answer the closed structured questionnaire and one hundred and twenty one (n=121) responded.

### 1.11.2 Data collection

Qualitative methods of data collection include a number of instruments such as questionnaires, interviews, focus groups, observations and document analysis (Creswell, 2014). Multiple methods are recommended for qualitative data collection for triangulation purposes. The only way to validate knowledge is through the real voices of the participants (Sutton & Austin, 2015) and as such, the study employed the following data collection instruments: face-to-face, semi-structured interviews with each participant, non-participatory observations of participants using OER in their teaching and document analysis related to OER policy documents. A methodological triangulation approach, by way of collecting data using different tools, is adopted for this study to enhance the quality of data and subsequently to enrich the quality of the research findings (Guion, Diehl & McDonald, 2011).

An in-depth description of the data collection process and procedures followed is given in Chapter 3.

#### 1.11.2.1 Semi-structured face-to-face (F2F) interviews

According to de Vos et al (2011:352), semi-structured face-to-face interviews are a way for the researcher to follow up on the emerging interesting avenues from the interview whereby the research participants can provide the researcher with the full picture of that avenue. The researcher used semi-structured face-to-face interviews with an interview schedule to have a perception of the central themes of the research participant's experiences. Semi-structured face-to-face interviews were conducted with nine lecturers who use OER in their teaching and learning (cf.4.4.1). Each participant was made to be conversant with the interview questions before the interview to allow time for reflection. The semi-structured face-to-face interviews were conducted at the university during the lecturers' non- contact time in their offices. Each interview was be audio-recorded, with the permission of the interviewees, and transcribed afterward. The interview placed much emphasis on lecturers to acquire a clear perspective on their use of OER in teaching. Each interview lasted 30 minutes.

#### 1.11.2.2 Closed structured questionnaire

A questionnaire is a structured research tool used to obtain information from the research participants through telephone, face to face, self-completion survey and the web. Normally, questionnaires employ standard questions to obtain information from the all-encompassing

scope of research participants to enable the researcher to have responses that can be compared. Results from questionnaires are often in the form of scores which are summarised to reflect the measure of the opinions and attitudes of the research participants.

The questionnaire is commonly used to analyse the research participants' beliefs. The designing of the questionnaire as a data collection tool will also permit the researcher to obtain data about events, people and objects that serve to measure the research problem. The participants in the semi-structured or open-ended questionnaires were allowed to answer the questions in their way whereas in the closed structured questionnaire the participants will only respond by choosing from a series of answers provided to them.

#### 1.11.2.2.1 Design of the structured questionnaire

The closed-structured questionnaire was the instrument used to gather data using the online system (quantitative phase) of this study. The questionnaire was made up of five sections with close-ended questions which made use of various Likert scales. The design of the questionnaire is summarised in Table 1.1 below:

*Table 1 1: Questionnaire design*

| Section | Item | Number of Questions |
|---|---|---|
| A | Biographic data | 07 |
| B | Conceptualisation of OER | 10 |
| C | Policies on re-use and adaptation of OER | 07 |
| D | Challenges in re-use and adaptation of OER | 04 |
| E | Models of re-use and adaptation of OER | 05 |
| | TOTAL | 33 |

The utilisation of closed-ended questions was mainly because they are often associated with quantitative designs. Another reason is that such questionnaires enable participants to choose from distinct responses. Zohrabi (2013:254) posits that ''closed-ended questionnaires provide the inquirer with quantitative or numerical data…'' The researcher used a closed-structured questionnaire to further saturate the findings of the semi-structured face-to-face interviews. The study focused on the views of lecturers who use OER in their teaching at three selected

teacher education faculties/colleges. The questionnaire was emailed to the one hundred (n=100) lecturers from the three selected teacher education faculties/colleges.

### 1.12. Data analysis

According to Cohen, Manion and Morrison (2011:237), data analysis is a standard process of coding,categorising and interpreting data in order to make findings on the phenomenon being studied.

#### 1.12.1 Qualitative data analysis

The first phase of data analysis involved qualitative methodology, where semi-structured interviews were used to collect data from lecturers. The collected data was analysed in order to set a tone for the development of a survey questionnaire to be used in the second phase of quantitative methodology of the study. MacMillan and Schumacher (2014:395) view qualitative data analysis as an inductive process of arranging data into groups and recognising patterns and relationships among the groups. Braun and Clarke (2006:6) also state that thematic analysis is a method of recognising, analysing, and describing themes within data. Their version of thematic analysis, which provided a six-phase guide, was used in analysing the data collected during the face to face semi-structured interviews with the participants. Ibid (2006:6) explained that even though thematic analysis can produce trustworthy and perceptive findings there is yet no clear consensus about how researchers can apply the method rigorously. This study employed the exploratory thematic analysis.

As said above, the Braun and Clarke (2006) thematic analysis chosen for the study provides a six-phase guide: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report.

##### 1.12.1.1 Phase one: Familiarizing with the data

The researcher involved himself in a rigorous process of immersing himself in data by carefully transcribing the interview sessions of each lecturer. The identification of patterns and meaning were completed as a result of rereading of the transcript. Analysis was done using NVivo 12. The analysis was conducted after transcripts were transmitted to the NVivo 12 software program in order to highlight patterns, language and themes that were deducted from the interview transcripts. Braun and Clarke (2006:87) confirm that familiarizing oneself with the collected data means focusing on reading and re-reading the data and noting ideas.

#### 1.12.1.2 Phase two: Generating initial codes

The creation of initial codes was part of the second phase. In the generating initial codes phase, the researcher reduced the data to a manageable size. This phase focused on the initial production of codes from the data, a speculative activity that requires the researchers to continue relooking at the data (Nowell, Norris, White, & Moules, 2017:2). This phase further categorised codes and produced an identity for the feature of the data relevant to the research questions.

#### 1.12.1.3 Phase three: Searching for themes

Theme search characterised the third phase. The coded nodes on NVivo 12 were read and reread in order to recognise larger patterns of meaning. The researcher analysed and sorted the codes to identify themes (Braun, et al., 2006:19). This helped to identify data of importance to the research questions and indicates some type of pattern.

#### 1.12.1.4 Phase four: Reviewing themes

The fourth phase involved reviewing possible themes. The researcher focused on clarifying the draft themes from phase three using a two-level analysis of the codes. In the first level, the codes for each theme were reviewed to determine the existence and development of a coherent pattern (Braun, et al., 2006:20). The identification of pattern meant the researcher moved to the second level of analysis by reading through the entire data set to ensure that the themes fit the data (ibid, 2006:20)

#### 1.12.1.5 Phase five: Defining and naming themes

In this fifth phase, themes were clearly described. Focus was on describing each theme in order to establish what feature research question was suitable for each theme (*cf.* 5.2.2 - 5.3.2; Figure 5.2)

#### 1.12.1.6 Phase six: Producing the report

This final phase involved description of themes, labelling and fabrication in a report. This was what made up the thematic analysis. The interpretation of data were guided by the research questions (*cf,* 1.6; 5.2.4.1 - 5.2.4.4.4)

### 1.12.2 Quantitative data analysis

The second phase of the data analysis involved the quantitative data collected through the closed structured questionnaire from lecturers regarding the use of OER. The online closed structured questionnaire was sourced online from lecturers after three weeks for analysis. The

Statistical Package for Social Sciences (SPSS) was used to edit, code and analyse the quantitative data collected from the close-ended questions. The results were presented descriptively in the form of frequency tables (cross-tabulations), histograms and pie charts and inferential statistics (factor analysis, t-test, ANOVA) (*cf.*5.4.2 – 5.4.5).

### 1.13 Trustworthiness of qualitative data

#### 1.13.1 Trustworthiness

In evaluating the quality of qualitative data, the concept of credibility, transferability, dependability, and conformability which are emphasised in this study comes to the fore. Qualitative researchers need to often ensure that there is precise recognition and recounting of research participants. The use of the thematic analysis method with the semi-structured interview discussion assisted in establishing the trustworthiness of the study.

#### 1.13.2 Credibility

This research study is credible when the research finding reflects the study's objectives which are accurate when measured. The research data accurately reflect the research participant's viewpoints.

In ensuring the credibility of the study, the researcher ensured frequent engagements with the Supervisor. The participants had sufficient engagements with the researcher to arrive at the rigorous approval of research findings. The Supervisor served as the debriefer with his extensive research experience. The researcher was on-site as a part of the semi-structured interview to ensure consistent data collection. The researcher's experience as a lecturer at the University of Limpopo, was used in engaging lecturers in this study. The credibility of the semi-structured interview discussion data was increased as the researcher implemented member-checking. Member checking enables participants to play an active role by factoring-in their own interpretations. Participants were requested to review data and make changes where necessary. The completion of the semi-structured interview discussion analysis involved a Senior Professor in the Faculty who was requested to validate trustworthiness.

#### 1.13.3 Dependability

In an attempt to ensure that the findings are relevant to the current real-life situations, critical readers were persuaded to align the findings. Research data was richly described to ensure its dependability. Another way used by the researcher to ensure dependability of finding was to verify their similarity under different conditions.

The study employed the intra-judge reliability in ensuring consistency from different evaluators of the research findings. Data from various semi-structured interview discussions were recorded, collected for three weeks.

### 1.13.4 Confirmability

Confirmability is the degree to which the researcher can indicate that the collected data reflects the participants' viewpoints. To obtain confirmability, the researcher ensured that his biases and viewpoints did not in any way influence the research findings. Confirmability refers to the establishment of whether the experiences and thoughts of the research study accurate represent only those expressed by the research participants.

### 1.13.5 Transferability

Wahyuni (2012:77) views transferability as the degree to which research findings can be relevant to other situations. The researcher alone was not the one to determine whether research findings can be transferred or not. Data was accompanied by sufficient evidence which was compared to participants' quotations.

The study involved participants drawn from among lecturers in the three teacher education faculties in South African Universities. Data collection methods, and the length of time over which data was collected helped ensure the transferability of the findings of the study.

## 1.14 Reliability and validity of quantitative data

The second phase of the exploratory design mixed method dealt with the quantitative methodology, where closed-ended questionnaires were used to gather and examine participants' data to evaluate the understanding of OER use by lecturers at teacher education faculties in South African Universities and then formulate research findings.

### 1.14.1 Validity of the instruments used in the study

Validity deals with the extent to which a thought or opinion can accurately relate to the real world. In other words, an observable measure is considered accurate if it yields consistent results which relate to the real world. An observable measure that is stable produces a consistent accurate representation of the actual concept-with the repeated measurement of the same population and instrument.

The researcher engaged in prolonged fieldwork with as many variables as possible through the closed-ended questionnaires conducted in natural settings.

### 1.14.2 Reliability of the Study

The instrument used to collect data ensured that it could stand a test of time by first ensuring its validity and that the closed structured questionnaire was the correct data collection tool. The test of reliability for the study was implemented through the measure of Cronbach's alpha coefficient. The Cronbach's alpha was used to measure the ''internal consistency'' of reliability in the study (Bonnet and Wright, 2014:01). The Cronbach's alpha test assisted the researcher to effectively assess the internal consistency of scales that were computed from the Likert scale items.

### 1.14.3 Triangulation

Triangulation is used in research to assist the researcher to examine all the data sources in order to increase the credibility of the study. According to Creswell (2014:259) this process of collecting data using a range of sources is called triangulation. The study used the original and the secondary data in attempting to advance its objectives. The study used mixed methods or multiple sources of data collection (interviews on use of OER) which were compared and cross-checked with questionnaire on use of OER) to analyse data in order to enhance the credibility of a research study (*cf.*4.6). As a result, the researcher depended on triangulation by cross examining and verifying diverse sources in order to have more certain about arriving at conclusions (Garaba, 2010:150).

## 1.15 Adhering to specific ethical considerations to conduct this investigation

The following ethical considerations guided the researchers' conduct throughout the study:

### 1.15.1 Ethical clearance and acceptance

Prior to the start of the research study, the researcher made an application which was granted for ethical clearance from the Ethics Office of the College of Education at UNISA in terms of university research policy. The researcher also made an application for ethical clearance which was granted by both the Ethical Committees of both UMP and TUT. In addition, the research participants signed a consent form to indicate their willingness to voluntary participate in the study and to immediately withdraw their participation at any given time (*cf*.4.6.1)

### 1.15.1 Ethical clearance and acceptance

Prior to the start of the research study, the researcher made two successful applications for ethical clearance to the Ethics Office of the College of Education (#2019/06/12/55362443/22/MC) (cf. Appendix A) and UNISA Senate, Research, Innovation,

Postgraduate Degrees and Commercialisation Committee (#2019_RPSC_043_AR) at UNISA in terms of university research policy (cf. Appendix B). The researcher also made an application for ethical clearance which was granted by both the Ethical Committees of both UMP (Certificate, Ref 29082019) (Appendix C) and TUT (REC/2019/09/004) (Appendix D). With reference to the impact of the COVID-19 pandemic, the researcher was compelled to revise the original applications. After revision, they were resubmitted to the College and University's Research Permission Subcommittee (RPSC) of the UNISA Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC). Two revised UNISA ethics certificates were issued on the 13th November 2020.

### 1.15.2 Informed Consent

The researcher ensured that the nine participants and the one hundred and twenty respondents were made aware of their freedom to withdraw from the study (*cf.*4.6.1.1) A consent letter was sent to all the participants and respondents before the commencement of each phase of the data collection process as the researcher was obliged to inform the participants (cf. Appendix E). Each participant and respondent was informed on the goal of the study, the duration of their involvement, procedures to be followed during the study and the pros and cons of the study.

### 1.15.3 Anonymity and confidentiality

The researcher ensured that participants and respondents are given assurance that their confidentiality and privacy was to be upheld throughout the research process. Participants and respondents were assured of their names being withheld and anonymity assured. The researcher used pseudonyms instead of real names when reporting on the results of the semi-structured interviews. The information gathered was used for research purposes and remained confidential.

### 1.15.4 Protection from harm

Research participants and respondents were protected from any harm as the study subscribes to the principle of respect for human dignity to ensure that there was no apprehension. Research participants and respondents were offered letters of assurance before their participation in the research process in order to emphasise their protection from any harm.

## 1.16 Clarification of concepts

Several concepts that are used in the study are briefly explained below. These definitions serve to explain the meaning of the concepts within the context of this study.

### 1.16.1 OER

OER in this study, are defined by Paris OER Declaration (2012) as resources that are freely issued to the public with a copyright license that allows no cost access, use, adaptation and redistribution by others with no or limited restrictions (Paris OER Declaration, 2012). In this study, OER refers to any online educational resource freely available for use by tutors, lecturers and any member of the public for free or without having to apply for a copyright license. The following are examples of OER: resources available in digital format, full courses, syllabi, audio and video materials and lectures under an open license

### 1.16.2 Use of OERs

The permission of the copyright holder usually granted through Creative Commons license for the users to add, edit or delete the freely available learning material on the net to be relevant to their specific teaching and learning needs without consulting the copyright holder.

### 1.16.3 OER-Pedagogy

Wiley and Hilton (2018:135) define OER-Pedagogy as a "set of teaching and learning practices that are only possible or practical in the context of the 5R permissions which are characteristic of OER."

### 1.16.4 Open Educational Practice (OEP)

A crucial element of OEP is the release of educational resources under an open licensing scheme (e.g. Creative Commons Licensing Framework) as OERs to enable free and open use, reuse and sharing at no cost to either party (Karunanayaka and Naidu, 2017:2). This study refers to digital Open Educational Practice (OEP) as a way of promoting learning based on students constructing their own knowledge. OEP in this study refers to the use of freely and openly available educational materials to promote learning.

### 1.16.5 Higher Education Institutions (HEI)

It is an institution of higher (or tertiary) education and research which awards academic degrees in various academic disciplines. Universities typically provide undergraduate and postgraduate education, research and community engagement, which meet the criteria for recognition as a university as prescribed by the Minister under section 69 (d). In the context of this study, HEI refers to the system where a teaching approach is used to allow access to education whenever possible through the use of technology enabled materials.

### 1.16.6 School of education/faculties/colleges of education

These terms refer to a division within a university that is devoted to providing higher learning in the learning of education. A university school of education/faculties/colleges of education is often part of a larger university. It is a higher education institution that provides tertiary education particularly on the learning of education but does not have full or independent university status.

### 1.17 Structure of the thesis

The thesis will be divided into seven chapters as indicated in the following layout:

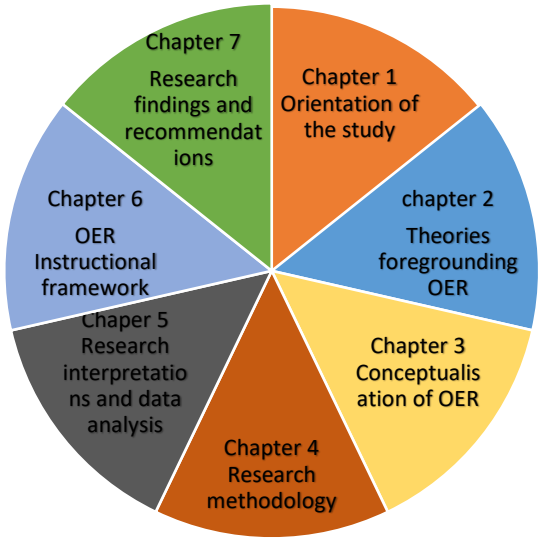


*Figure 1. 2: Structure of the thesis*

**CHAPTER 1**: this chapter entails an orientation of the study. It establishes the background to the study, states the problem, research questions and objectives and significance of the study. This chapter also overviews the research design and methodology adopted to conduct an investigation of the problem.

**CHAPTER 2**: this chapter presents the integrated theoretical framework which underpins the study and formed a blue print on which the study was built. The broad learning theories that underpin this study are: Connectivism learning theory and Roger's diffusion of innovation (DOI).The researcher examined the theories in order to demonstrate their connection to the use of OER.

**CHAPTER 3:** this chapter presents a review of literature on the use of OER covering such issues as Conceptualisation of OER by lecturers, the use of OER in Teaching and Learning,

Challenges on the use of OER, Institutional Policy and Support of OER and lastly, Trends on the use of OER in the world.

**CHAPTER 4**: this chapter outlines the methodological approach of the study which highlights the research design and the research paradigm adopted to explore the lecturer's views on the use of OER at teacher education faculties in South African Universities. This chapter outlines the study population, the sampling procedure and the study sites. Additionally, this chapter put forward the data collection instruments, data collection procedure and the data analysis process. Ultimately, the approaches employed to ensure the trustworthiness of the study are described, factors that limit the study, as well as the ethical issues that the study raised are described.

**CHAPTER 5:** this chapter presents the data analysis and interpretations of findings from the semi-structured interviews and questionnaire. Data is presented based on the themes that emerged from the data itself in order to answer the research question. This chapter also presents a discussion of the findings to respond to the research questions and sub-questions as highlighted in Chapter 1. This chapter highlights the findings that come out of the data and describes the relationship between the findings and existing literature reviewed in Chapter 3.

**CHAPTER 6:** this chapter presents an OER instructional framework proposed by the researcher to address the challenges as experienced by lecturers at teacher education faculties in South African Universities in the use of OER.

**CHAPTER 7**: this chapter presents the researcher's academic deliberation and put forward recommendations emerging from the study to address challenges related to the use of OER as experienced by lecturers at teacher education faculties in South African Universities. This chapter further underlines the manner in which the findings of the study contribute to the body of knowledge and identifies areas for further research in the field of OER.

### 1.18 Conclusion

This chapter provides an overview and the context of the study. The chapter briefly describes the background of OER. It then proceeds to show evidence from the literature on the relationship between OER and teaching. The objectives and the research questions of the study were also described in this chapter in the light of the development on the use of OER at universities. As part of the study's significance outlined in this chapter, feedback is provided for policymakers and universities, to enable them put in place strategies for enhancing university re-use and adaptation of OER as an approach to their teaching practice. Finally, the chapter provides the definitions of some of the key concepts used in the study.

# CHAPTER 2: THEORIES CONFIRMING THE USE OF OPEN EDUCATIONAL RESOURCES (OER) IN TEACHING AND LEARNING

## 2.1 Introduction

The previous chapter presented the background of the study, problem statement as well as the aims and objectives of the study. This literature review chapter focuses on literature on the use of OER in teaching and learning. The review of the theories underpinning OER done in this chapter serves to explore how various theories will foreground the problem of lecturers' use of OER at university level. Currently, researchers need to understand the motives behind lecturers' use of OER in teaching and learning. The solution was the proposal of theories like Connectivism and Diffusion of Innovation (DOI) theory.

The use of digital technologies like OER in teaching practices has expanded to all other types of teaching and learning institutions including traditional and avant-garde (Ossiannilsson, 2019:143). Equally, Hodgkinson-Williams, Arinto, Cartmill & King (2017:56) declare that OER has a potential to widen access to educational materials, thereby enhancing the quality of educational materials, bringing improvements to the quality of teaching and learning and enhancing educational affordability. Naturally, this has challenged the currently dominant teaching and learning approaches effect flexibility.

Moreover, although more OER studies indicate benefits associated with their use, there are also barriers to OERs in higher learning institutions. OER's potential to transform teaching has not yet been realised, mainly because of the lack of awareness on OER (Cox & Trotter, 2017; Hodgkinson-Williams, Arinto, Cartmill & King, 2017; Westermann Juárez & Muggli, 2017). The deduction from the foregoing scholars' assertion is that higher education institutions, by not being aware of OERs, deprive themselves of its benefits.

The researcher discussed the two theories underpinning the use of OER in teaching and learning. The discussion on the historical background of the use of OER in teaching and learning will follow. Thirdly, the conceptualisation of the use of OER in teaching and learning will come up for discussion. Principles of OER are discussed in the fourth section. The fifth section deals with the importance of OER use in teaching and learning. The sixth section presents the benefits of OER use and the seventh section deals with the challenges of OER use. Finally, the eighth section presents the research findings on the use of OER in teaching and learning.

### 2.2 Theories underpinning OER

Most theories of teaching and learning are applicable in the use of OERs which rest on the assumptions held by many scholars that OERs broaden educational access and transform teaching practice. OERs include teaching, learning and research materials which are freely available in the public domain. They come with prospects for expanding qualitative teaching and learning. It is therefore advisable for teaching and learning institutions to take advantage of OERs in making their curricula approaches flexible.

#### 2.2.1 Connectivist Learning Theory

A key theory considered relevant for this study is the Connectivism theory. Connectivist Learning Theory was developed by George Siemens and communicated on his elearningspaces.org blog in 2004 (Utecht & Keller, 2019; Corbett & Spinello, 2020). These connectivist theory founders identified limitations to the behaviourism, cognitivism and constructivism learning theories, which they submitted make no provision for the effect of technology in teaching and learning (Nyadenga, 2019:9). Siemens (2006:4) establishes connectivism as a theoretical framework observing learning as a network phenomenon supported by technology and socialization. Downes (2006:9) posits that connectivism is the assumption that knowledge is disseminated over a network of connections, and hence that learning consists of the capacity to create and extend across those networks.

Connectivism is defined as the networked social learning accentuated by distributed learning, encouraged by the observation that knowledge may inhabit digital tools. It is also encouraged by technology (Naidoo, 2020:90). Moreover, connectivism is based on the understanding that decisions and decision-making processes are based on rapidly changing foundations (Siemens (2005:5). Similarly, a connectivist learning approach entails a constructivist conception owing to the fact that there is often a connection among students resulting in them constructing knowledge and establishing the learning networks (Nyadenga, 2019:12). Connectivist learning takes much from the available internet and technological resources to construct an essential network that promotes learning (Mpungose, 2020:3). The following are eight principles of connectivism learning according to Siemens (2005:6):

- Learning and knowledge rests in a diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.

- Capacity to know more is more critical than what is currently known.

- Nurturing and maintaining connections is needed to facilitate continual learning.

- Ability to see connections between fields, ideas, and concepts is a core skill.

- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.

- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality.

According to Abdullah (2021:80) point out that the principles indicate that Connectivism Theory emphasise the individual together with his or her unique knowledge. In contrast, AlDahdouh (2018:4) assert that the principles of connectivism are not bringing new things to the existing knowledge base and those principles were already being implemented in the educational sector before the emergence of connectivism.

Siemens (2005) and Downes (2006), as advocates of connectivism theory, submit that the connectivism learning theory is rooted in the principles of chaos, network and complexity theories. Siemens (2005:4) points out that the capacity of chaos to accept and adjust to pattern shifts is a key learning task. Moreover, the concept of chaos theory had been put forward as an entrance into the infinite prospects for the creation of solutions to global, national and regional challenges through education (Shukie, 2019:58). Chaos theory establishes a new way of thinking regarding teaching and learning. Downes (2006:93) also caution that the connectivist approach in education leads to chaos and may not be relevant to traditional learning and existing academic institutions.

Downes (2012:15) identifies three features of knowledge, learning and community in describing the network theory that enlightens connectivism. Ozturk (2015:n.p.) views knowledge as "…the building block of learning; what members learn informs the community and the knowledge created in that community in turn informs its members". Similarly, Goldie (2016;n.p) supports this perception by asserting that the point of departure for learning is when students start connecting and being actively involved in a learning community. Learning is an activity that occurs within undefined environments that is not under the human control (Siemens, 2005:5). Further, Siemens (2017:n.p) adamantly views learning as the changed emotional, mental, physiological skills brought about as a result of interactions and experiences with learning content. An assumption of assertion is that a student can attain emotional, mental, physiological skills with guidance from the teacher in mediating with the teaching and learning process. Downes (2012:17) describes the community as the place in

which students gain learning experiences, and also the environment through which the students interact with each other on these experiences. In addition, learning takes place in communities, where the practice of learning is the involvement in activities within the community (Siemens, 2006:23).

#### 2.2.1.1 Theoretical foundations

Connectivism learning theory is presumed on principles of chaos, complexity and network theory (Nyadenga,2019; Darrow,2009; Siemens, 2004). Notwithstanding the strict intellectual property laws and economy-minded publishers who can hinder the use of OER in teaching and learning, connectivism draws strength from OER (Darrow, 2009:47). The OER movement is buttressing connectivism principles by assisting in closing the digital divide while also enabling unique opportunities for augmenting Instructional Technology coursework (ibid, 2009:48). Possible benefits of connectivism learning theory include the potential to improve education through the revision of educational position and to bring about a shift toward learner-centered education (Siemens, 2004:n.p). The following is the understanding of principles of chaos, complexity and network theory for collaborative knowledge creation.

##### 2.2.1.1.1 Chaos theory in education

The current technological advancement poses the need for new learning styles in the education systems. The traditional classroom has been modelled after the teacher-centred approach where the teacher is the regulator and moderator of teaching and learning. This content-driven teaching in traditional classroom lectures promotes passive learning, and discounts the students in the acquisition of creative problem-solving and critical thinking skills (Weichhart, 2013: 37). Downes (2012:93), in contrast, clarified that learning should not follow a structured, controlled or processed approach. Researchers of teaching and learning have a predicament of redesigning structured, controlled or processed learning. The study follows the lead of Downes (2012) and Siemens (2005) in accepting that chaos theory has the ability to assist researchers of teaching and learning.

Akmansoy & Kartal (2014: 511) alerts education practitioners that the implementation of chaos theory to the schooling system provides opportunities for change and transformation, in view of the fact that learning and thinking are not linear processes.

Shukie (2018:38) points out that “by better understanding how chaos theory opens up what is possible, educators find encouragement to seek alternatives to traditional institutional practice.” More so, chaos theory has been argued to contribute towards more choices for lecturers and students, and complicating the final outcomes through its creation of tension and

conflict consequent upon unpredictable decisions made in the classroom by teachers and students (Odrowąż-Coates, 2019:6). In addition, Downes (2012:48) also points out that the interaction of lecturers and students in the classroom does not only promote human contact but also provides human content, leading to the production of a deep layer of learning content.

#### 2.2.1.1.2 Complexity theory in education

Daryania & Aminib (2016:160) define complexity as a feature of a system that appears as a result of the interactivity of the individual components of the system. Connectedness is one of the key facets of complexity theory (du Plessis, 2021:283). The inter-connectedness in education systems is characterised by multiple sub-systems which interact with each other (ibid, 2021:287). As explained by Cohen, Manion & Morrison (2011:28) the relationship between different elements of the system influence each other and their extensive environment. As such, du Plessis (2021:287) explains that the effectual nature of an education system is emphasised as it is made up of multiple interrelated elements with each having its own unique purpose. This study needs to research this education system in an extensive and comprehensive way (ibid, 2021:287). Manion & Morrison (2011: 30) also agree that the connectedness feature of complexity theory implies that phenomena must be viewed in a comprehensive way. Complexity theory has emerged as a way of recognising organisations with an appreciation that change is neither linear nor rational (Mchunu, 2015:101). According to du Plessis (2021: 287), this concept is useful in teaching and learning contexts, where "…theory recognizes the relationship of a system with its external environment and the influence this environment may have on the system." He further adds that complexity theory considers the multiple relationships that exist with the external environment.

#### 2.2.1.1.3 Network theory in education

The ever increasing technological connection facilitated by the internet has given rise to collaborative digital cities which have become a collective network connecting people both locally and globally (Duke, Harper & Johnston, 2013:7). Bell (2009:n.p) submits that the concept of network is an important aspect of connectivism which distinguishes knowledge as a flow through a network of humans and artifacts. He also views networks as containing connections between individuals, groups, systems, fields, ideas, resources or communities. In addition, Downes (2012:112) also views network theory as a description of networks, and the application of that description to other phenomena. Downes (2012:9) further states that: "connectivism is the thesis that knowledge is distributed across a network of connections. Hence learning consist of the ability to construct and traverse these networks". In that view, the connectivist learning approach implies networked learning characterised elements that

can be connected to other elements. A network constitutes connections, joining nodes, where the nodes can be individuals, groups, systems, fields, ideas, resources or communities (Bell, 2009:n.p). Duke, Harper & Johnston (2013:7) reveal that students are able to obtain an outlook and assortment of opinions to learn to make critical decisions with the aid of personal networks.

### 2.3 Relevance of connectivism to teaching and learning

Fouladchang (2018:103) assumes that connectivism is the contention that knowledge is disseminated across a network of connections, and that learning has the potential to construct and to stretch across those networks. Shrivastava (2018:4) maintain that connectivism is one of the most distinguished of the network learning theories that have been designed for e-learning habitats. Isaksson (2020:6) adds that the frame of reference of connectivism is that, to date, the centre of attention has been on the individual nodes of a network as opposed to the entire network's interaction. Furthermore, connectivism uses both human and inhuman sources alongside technological resources to build new learning networks that is beyond formal educational systems (Jung, 2019:50). It inspires the current teaching and learning practices to review and make relevant changes for quality teaching and learning process. These existing technology-orientated practices generally take place in an environment characterised by socio-economic challenges. Such challenges include little or no access to Internet technologies and digital tools. Connectivism underlines the importance of being adequately equipped with internet and digital tools while teaching and learning as these enable access, sharing and use of information. Furthermore, connectivism sees students as nodes in a network (AlDahdouh, 2018:1).

Connectivism is a crucial feature in the teaching and learning relationships which include students, his/her classmates as well as lecturers. These relationships are viewed as connections (AlDahdouh, 2018:3). In a teaching and learning environment, knowledge is generated in the networks through the interrelation activities between students and lecturers (Martínez & de Frutos, 2018:24). These interrelation activities in the teaching and learning are facilitated by technology. These new forms of social interactions promoted by technologies come with a demand of definition of the concept of community; a virtual community designed over the internet characterised by immediate and continuous connection within the community (ibid, 2018:27). They further add that the new model social interaction creates self-reliance in the network, as a consequence of the fragile nature of the ties. The virtual community must exhibit an acceptance of an element of connectedness. According to connectivism, the

conservation of existing connections, deciding on specific additional connections and creating new connections are the necessary part of teaching and learning (AlDahdouh, 2017:4).

Connectivism is distinguished as the improvement of how a student learns with the knowledge and perception obtained through the incorporation of a personal network (Siemens, 2004:6). This learning theory presents a model of learning that enables significant shifts in society where learning is no longer an internal, individualistic undertaking (ibid, 2004:6). The abrupt change resulting from the emergence of educational technologies limits the explanation of learning by means of traditional learning theories (Duke, Harper & Johnston, and 2013:7). Students are currently enabled to use technology to create their own information networks which include learning communities providing them with an opportunity to participate in the knowledge creation process (Dunaway 2011: 675). This shift to describing learning through educational technologies is increasingly placing learning theories within the digital era.

These digital era learning theories, like connectivism, are assisting to define learning and shape teaching and learning activities. These new systems of knowledge creation can be an important instrument for educational practitioners globally, enabling them to embrace, and use the said new systems for public discourse (Utecht & Keller, 2019:110). These involve students familiar with peer-reviewed content and enables them to critically scrutinise this new crowd-created knowledge (ibid, 2019:110). Students will benefit by becoming competent as lecturers pursue implementing suitable pedagogical methods and student support in a bid to improve student's learning benefits (Foroughi, 2015:21). To assist students, lecturers will be learning while being involved in teaching and learning and orientating students about various learning platforms.

Connectivism explains how and why students connect to the network in order to access the latest information available on a topic (Mudaly, 2012:47). Students are involved in learning by connecting and interacting with the information available on the net, leading to the creation of new information to be shared with other students. A connectivist approach to teaching and learning emphasizes the student as a source of information (Brooks, 2015:29). In addition to students having access to digital instruments, lecturers must also subject students to information literacy skills to enhance inquiry-based learning. "The idea that everyone can and should use the data openly available to them to rethink ideas, create new data, and investigate findings in an open and collaborative format, has potential to contribute to and offer grounding for myriad lines of scholarship inquiry at higher education institutions." (Utecht & Keller, 2019:111).

Connectivism was introduced as a theory of learning founded on the supposition that knowledge does not exist in the head of an individual but in the world (Mudaly, 2012:5). The introduction of educational technologies enables teaching and learning to derive meaning from digital applications. When Bell (2010:530) observed that connectivism has the potential to improve interconnection between people and to enhance innovative dialogue and people improving their connections with resources, he was also buttressing the connections between people through the digital tools. Similarly, Utecht & Keller (2019:112) posit that users having openly available data may use computers to learn and find suitable data assisting them to learn and acquire decision-making skills leading to new discoveries.

The context aspect of connectivism is suitable to the teaching and learning system with its attributes and this will apply throughout the study. Connectivism accepts and supports a critical process of thinking over the available wealth of information. In other words, connectivism does not only concern itself with the availability of information, but also observes the utilisation of the available information to produce new information. The fifth principle of connectivism states that the "capacity to know more is more critical than what is currently known." (Siemens, 2005:8). The emphasis is on the ability to move beyond knowledge of information but knowing how to apply the information.

Scholars argue that collaboration does not only suggest face-to-face collaboration but also involves collaboration beyond time and space (Duke, Harper & Johnston, 2013; Utecht & Keller, 2019). This is consistent with a connectivist learning approach. Constructivist learning theory posits that the accurate strength of digital tools and their promise to students is the opportunities for connections that students can create with others, or the exact collaboration that can happen, and the strength of an immediate learning atmosphere (Utecht & Keller (2019:114).

### 2.3 Roger's diffusion of innovation theory (DOI)

The diffusion of innovation theory (DOI), as propounded by Everett Rogers (1983), was popularised in his 1962 book. Rogers (2003:5) describes diffusion as "a process in which an innovation is communicated through certain channels over time amongst members of a social system." As a consequence, diffusion is viewed as a gradual activity whereby an innovation is distributed through channels within the members of the social system (Mudaly, 2012:28). The foregoing definition of diffusion provides four main elements of diffusion which are: (1) the innovation; (2) communication channels; (3) time; and (4) social system (Rogers, 2003:11).

### 2.3.1 Innovation

Rogers (2003:12) views innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption.” Innovation occurs through an action whereby a new idea or behaviour contrary to the existing forms of ideas or behaviours is invented. Diffusion takes place when an individual conversant with innovation passes on his/her knowledge on an innovation to other individuals who are not conversant of the innovation through communication channels (Abdullah, 2021:79). This study regards the use of OER in teaching and learning as an innovation. The spreading of innovation can be attained in the light of Rogers’ (2003:990) five characteristics of innovation which are as follows:

- Relative advantage: The more significant the perceived quality of innovation, the more swift its rate of adoption is expected to be (Rogers, 2003:990). With OER being seen as high-quality educational material and known to enhance quality teaching and learning, if lecturers develop and create OER then the cost of achieving quality teaching and learning will be minimised.
- Compatibility: It refers to the extent to which an innovation is recognised as being in agreement with the belief system of individuals (Rogers, 2003:990). With most South African lecturers being used to teaching and learning that is technology-enabled, the use of OER in teaching and learning is considered a compatible innovation.
- Complexity: refers to an extent individuals perceive an innovation to be difficult to understand and use (Rogers, 2003:990). The more lecturers at South African universities are made to understand the use OER in their teaching and learning the quicker they will adopt OER in their teaching practice to develop new teaching approaches.
- Trialability: It refers to the extent to which an innovation can be experimented without adopting it (Rogers, 2003:990). Lecturers at South African universities should be encouraged to experiment with using OER in their teaching and learning without any coercion into using them.
- Observability: refers to an extent to which the use of innovation is visible to the individuals in their surroundings (Rogers, 2003:990). The easier it is for lecturers to see the results of OER use in teaching and learning, the more likely they are to adopt Use of OER themselves.

### 2.3.2 Communication channels

Diffusion is the process by which an innovation is communicated through selected channels over time among members of a social system (Rogers 2003:990). Communication is one of the four elements emphasised in the foregoing definition and plays an important role in the

diffusion process as it influences the rate of acceptance and adoption of an innovation. Communication channels include the creation and sharing of information amongst individuals through face to face or mass discussions. A large population can be reached through mass media channels whilst interpersonal channels could assist in reaching and convincing individuals to adopt the innovation (Mudaly, 2012:28).

The two concepts of homophily and heterophily with regards to communication were introduced by Rogers (2003). Rogers (2003:19) defines homophily as "the degree to which pairs of individuals who interact are similar in certain attributes, such as beliefs, education, social status, and the like." Barranco, Lozares & Muntanyola-Saura (2019:599) describe Heterophily as "the tendency of people or groups to maintain a higher proportion of relations with members of groups other than their own"

Rogers (2003:19) asserts that diffusion of innovation requires that at minimum some extent of individuals with different attributes. The transfer of information will likely occur between lecturers with different OER skills. The study also sought to examine homophily or heterophily as this determines if lecturers involved the use of OER in teaching and learning can learn from each other.

### 2.3.3 Time

Time is the duration required for an individual to live through the innovation decision process (Abdullah, 2021:79). Time is a crucial element in controlling the quality of the innovative process. Rogers (2003:21) emphasizes time as an important element of any communication process. Moreover, Sasidhar (2020:11) posits that time as the third feature in the diffusion process entails the following aspects: i) innovation – decision process ii) innovativeness, and iii) rate of adoption of innovation.

i) Innovation – decision process

Rogers (2003) describes the process through which an individual or an organisation goes before taking a decision to accept or adopt an innovation. Rogers (2003:168) describes the innovation-decision process as, "an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation."

The innovation-decision process is aiming at the pointing out reasons behind the acceptance or adoption of an innovation. The focus of this study is the decision process taken by lecturers at teacher education faculties/schools in South African universities.

1) Knowledge: There is an awareness of OER by lecturers who ultimately has some idea of how it functions.

2) Persuasion: The lecturers shapes a favourable or unfavourable viewpoint toward the use of OER in teaching and learning.

3) Decision: The lecturers take part in tasks that lead them to a decision to adopt or reject the use of OER in teaching and learning.

4) Implementation: The lecturers use the opportunity to put OER into use.

5) Confirmation: The lecturers assess the results of a decision to use OER in teaching and learning.

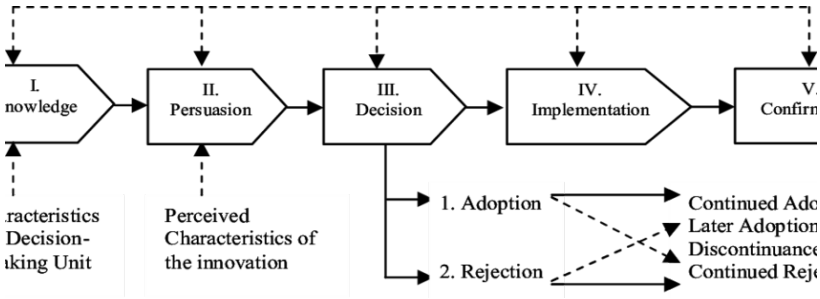


*Figure 2. 1: Diffusion of innovation (adapted from Rogers, 2003:170)*

ii) Innovativeness: It is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system (Sasidhar, 2020:12). Similarly, Rogers (2003:22) views innovativeness as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system." There are five categories of adopters, namely, innovators, early adopters, early majority, late majority, and laggards (Bhattarcherjee 2012:31) described as in figure 2.1 and as follows:

1. Innovators include lecturers who are first to try OER in their teaching and learning. These are the users who are adventurers an open to try new innovations. These categories of users are comfortable with risk taking.

2. Early Adopters include influential users who are active in social media systems. The characteristic of users in this category is that of acting as change agents, enjoying leading, and often ready to embrace change.

3. Early Majority includes users who are not necessarily leaders but are amongst the early majority as the technology begins mass market appeal. The users of this category

are ready to adopt new technology but need evidence of its functioning before adoption.

4. Late Majority includes the users who are doubtful of change and will be willing to adopt new technology after it has been widely used by the majority. This category is characterised by users with less money, a lower social status, and fewer relationships with leaders and innovators.

5. Laggards include users who are often late to try a new technology and are mostly reluctant to try new ideas. The users of this category are characterised by low socio-economic status and scarcely accept opinions of others outside their social circles (Rogers, 2003:22).

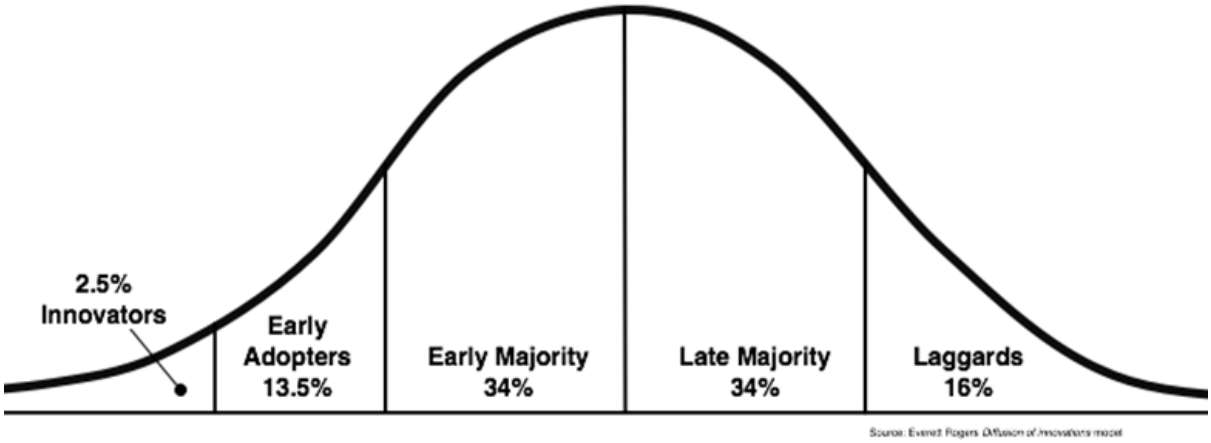


*Figure 2. 2: Categories of adopters*

ii) Rate of adoption of innovation.

The rate of adoption introduces the reasonable speed with which a new idea is accepted and is measured as regards to the number of members that embrace the new idea at a given time (Rogers & Scott, 1997:7-8). It is the practicable speed within which an OER is validated by the university community. Furthermore, Rogers (1995:20) points out that the innovation's rate of adoption in a system is achieved by being measured as the number of members of the system that adopt the innovation in a given time period. Similarly, Scott & McGuire (2017:121) adds that "While the quality of innovativeness pertains to individual adoption decisions, the rate of adoption provides a measure of the cumulative number of adopters in a field or social system."

### 2.3.4 Social system

A social system is “a set of interrelated units that are engaged in joint problem solving to accomplish a common goal” (Rogers, 2003:23). A social system is viewed as interconnected elements working together to achieve a common solution to a problem. The elements of the social system include individuals, informal groups and organizations. The collaborative aim of seeking a common solution to a problem is a unifier for the social system. Sasidhar (2020:13) mentions that **d**iffusion of information occurs within a social system. In the diffusion process, there are individuals that are able to influence other individuals' attitudes or overt behaviour informally in a desired way with relative frequency. Scott & McGuire (2017:121) posit that “Early adopters within the system who are also connected with interpersonal networks may serve as opinion leaders who can be quite influential in promoting the adoption of an innovation within a social system.”

*Table 2. 1 Summary of the theories that underpin this study*

| | Connectivism Learning Theory | Diffusion of Innovations Theory |
|---|---|---|
| Initiator | George Siemens & Stephen Downes 2005 | Everett Rogers 2003 |
| Focal point | Focuses on the use connected networks and collaboration in teaching and learning | Focuses new innovation and its spread through communication channels |
| Learning types prescribed | Interrelated and interactive learning | Technology-based learning |
| Factors influence learning | Diversity of networks | Communication channels |
| Suggestions for this study | Significance of connectivity for the use of OER in teaching and learning | Acceptance of the use of OER in teaching and learning |

### 2.3.5 Relevance of diffusion of innovation theory

Diffusion of innovation theory in its simplest form, offers a useful and systematic approach to the creation of teaching strategies guiding and supporting lecturers to adopt technology in their teaching and learning (Goh & Sigala, 2020:160). Educational practitioners in a number of countries such as the United States (US) have the DoI theory to increase the acceptance of new teaching and learning technologies. Curtis (2020:148) observes that the speed in which an innovation diffuses in a group of people is determined by five characteristics of the diffusion theory which include relative advantage, compatibility, complexity, trialability, and observability. Otherwise, although the diffusion of innovation theory is currently recognised within the field of instructional technology, there is still a lack of knowledge on their adoption or rejection (Surry & Brennan, 1998:3). Almobarraz (2007) discusses the applicability of DoI theory to examine perceived attributes as predictors of internet adoption amongst faculty members of Imam Mohammed Bin Saud University, reaching the conclusion that the diffusion theory could predict internet adoption. However, Minishi-Majanja & Kiplang'at (2005:223) disagree, pointing out that the theory does not sufficiently provide the core for foretell outcomes as well as offering guidance as to how to quicken the rate of adoption. Conversely, Ezra & Monsurat (2015:86) point out that the power of observability from Rogers (2003) influences research studies on what makes an innovation more readily noticed.

## 2.4 The global use of OER

The foundation of OER movement earlier work can be traced back around learning objects although the idea never took off for some time for several reasons which include poor discoverability of learning objects during those times (Mishra,2017:369).

Globally, the OER movement effectively started with earliest experiments of the Massachusetts Institute of Technology's (MIT) Open Course Ware (OCW) which greatly ignited the rise of the OER movement worldwide (Alkhasawneh,2020:212). As OER are most relevant aspect to lifelong learning, the ability to provide access to OERs need to dealt with by many countries (Commonwealth of Learning, 2017:21).

### 2.4.1 The use of OER in developed country contexts

Literature on the use of OER in the developed countries, the United States (US) in particular, indicates that most attempts at integrating OERs are determined by the strategy of the William and Flora Hewlett Foundation (Spilovoy, Seaman & Ralph, 2020:8). Open Courseware Consortium, Open Educational Resources Commons, Carnegies Mellon Open Learning Initiative, Multimedia Educational Resource for Learning and Online Teaching (MERLOT), Commonwealth of Learning (COL) and Directory of Open Access Journals (DOAJ) are

the various initiatives collaboratively participating in a combined effort to sustain the OERs (Wahid, Saidin & Arif (2018:156). Many universities in the Global North are well-resourced and have launched extensive initiatives that openly share OER with the public (Cox & Trotter 2017:151).

The first world countries who are already employing 4G mobile networks are far ahead of many developing countries as their mobile networks are updated (Kende, 2014:19). There is thus no wonder at the position of developed countries as front runners particularly regarding access to funding for OER initiatives with countries like Canada owning a repository with a large number of open textbooks (McGreal, 2017:295). However, the Thoms and Thoms (2014) study points to the fact that research on the quality of OER, in addition to strategies for their effective integration with more traditional Foreign Language (FL) materials, is yet to be complete. In addition, OER uptake by universities is yet to be made a normative practice across all faculties and disciplines (Cox & Trotter 2017:151).

Wahid et al (2018:157) also note that studies exploring OER practices in the UK, USA, Canada, South Korea, Japan and Turkey singled out copyright concerns and their results on duplicability. Falconer et al (2013: 7) also suggests that policy makers require much understanding of the factors that influence OER usage. There is evidence of excellent work on the production of OERs but little is known as to whether lecturers and students search for educational resources related to their disciplines (Adams, Liyanagunawardena, Rassool & Williams, 2013:n.p).

### 2.4.2 The use of OER in the African context

There are several initiatives in Africa to support the use of OER in teaching and learning. The South African Institute of Distance Education (SAIDE) is an African initiative associated with African Health OER Network involved in the collaborative development of (OER in) Africa (Rambe & Moeti, 2017:639). The OER Africa initiative was developed in Africa to promote and support the creation and use of OER (Ngimwa & Wilson, 2012:3). Also to be counted is the TESSA project which has externally funded and is already enabling free access to quality educational resources (Mushi & Zainab, 2012:18). The African Virtual University (AVU) is another initiative in Africa launched with the assistance of the World Bank. It was initiated to provide distance, asynchronous learning using OERs to 54 learning centers located in sub-Saharan Africa countries (Buliva, 2018:n.p).

Notwithstanding the above initiatives in Africa, the MIT open courseware statistics noted the low use of internet for teaching and learning purposes which indicates only 1% of MIT Opencourseware traffic since 2004 came from users in sub-Saharan Africa (Lwoga, 2012:5).

Percy and Belle, (2012:118) also report that already there is very little research available around the use of OER by the lecturers especially within an African context.

Literature indicates that the OERs used in most developing countries are often not well contextualised. Walji and Hodgkinson-Williams (2018:5) point to a growing number of OER studies in the Global South, which indicate the shift away from publication of OER repositories to OER practice. It is suggested that most universities in the developing countries should initiate their own OER projects (Ochukut & Omwansa, 2016:n.p).

The entrance of OER into Africa has not been free from challenges. King, Pegrum and Forsey (2018:4) identified the challenges confronting OER in Africa. These authors identified difficult access to the internet as an obstacle. This is particularly due to infrastructure limitations. Students still struggle to use the relevant ICTs through stable internet connection. Mtebe and Raisamo (2014:250) also add that most instructors in developing countries lack the relevant expertise and experience to produce quality educational resources. Tlili, Ofosu and Zhang (2021:3) identify the serious challenge faced by most African countries including the fact that educators still have different pedagogical beliefs towards OER.

### 2.4.3 The use OER in the South African context

In South Africa, HEIs are not yet equipped with broadband-width and this limits the development potential of web technologies (Lwonga, 2012:6). Bandwidth issues are a contributing factor in the poor use and slow uptake of OER (Haßler & Jackson, 2016:112). Notwithstanding the challenge of OER at HEIs as pointed out by Hodgkinson-Williams (2010:13), the literature indicates empirical evidence of some OER uptake at some South African HEIs (King, Pegrum & Forsey, 2018:7).

Baijnath (2018:96) found that partnership between numerous stakeholders in South Africa can improve resources and extend and produce cooperation to sustain OERs. However, more institutional intervention is still required in South Africa to address the ICT infrastructural and policy issues in order to expedite OER adoption in teaching and learning in South Africa (Hart, Chetty, & Archer, 2015:41).

Like other developing countries, South Africa has policies aimed at supporting the adoption and use of OER, specifically at it universities. The White Paper for Post School Education and Training (PSET) System (DHET, 2013) mandates the creation of space for OERs to supplement face to face instructional approaches in South Africa (Baijnath, 2018:96). The policy positions OER as necessary to assist accessibility to, and the use of, high quality educational materials that can boost teaching and learning and foster the development of

students' self-regulated learning. However, to date there is little research conducted in South Africa on lecturers' adoption of OER, even though there has been growing interest in the field (Cox & trotter, 2017:152).

### 2.5 Specific OER legislation in South Africa

Currently in South Africa, there are no national OER policies to support the use of OER in teaching and learning at HEIs. The support of the South African government in the creation and use of OER is crucial as it will enhance the culture of knowledge sharing and course development in HEIs. Kelly (2014:27) observed the resolution by governments and international organizations in using their policies to support the creation, development and maintenance of OERs. Nikoi et al. (2012:180) suggest that these policies need to align with the intentions of the HEIs engagement in OER work and provide institutional support to the processes leading to creation of reusable products.

#### 2.5.1 White paper for post-school education and training: building an expanded, effective and integrated post-school system (2013)

The main purpose of the White Paper is to create an 'expanded, effective and integrated post-school education and training system', proactively bringing solutions to the South African developmental challenges (DHET, 2013). **The** White Paper for PSET System addressed the need for the development of qualitative teaching and learning resources emanating from the expertise of quality scholars. Section 7.5 of this policy states that the Department of Higher Education (DHET) endeavours to ensure more funding to the design and development high quality resources that should be made freely available on the net. The DHET has dedicated to reinforce its obligation under Section 7.5 to ensure the creation and sharing of teaching and learning materials as OER in the post-school sector and for teaching materials from SAIVET to be made freely available as OERs.

#### 2.5.2 Draft policy framework for the provision of distance education in South African universities

The DHET lays emphasis on the value of OER in their Draft Policy Framework for the Provision of Distance Education in South African Universities (DHET, 2014). The policy guides universities and private providers in enhancing their understanding of how they can respond to changing teaching and learning environments by collaborating in the production of quality learning resources and use of OER. The DHET acknowledges that OER can benefit its higher education institutions' teaching and learning through lecturers' continuous efforts to use, reuse and adopt OER.

The Draft Policy Framework for the Provision of Distance Education states as follows:

> 5.2.1 High quality learning resources are integral to high quality distance education and a growing reliance on resource-based learning among universities generally is noted.
>
> 5.2.2 To avoid unnecessary duplication and to encourage increased quality by opening learning resources to public scrutiny, the DHET will pursue the adoption or adaptation, in accordance with national needs, of an appropriate Open Licensing Framework, such as the Creative Commons, for use by all university stakeholders, within an overarching policy framework on intellectual property rights and copyright in university education. In particular, in line with the UNESCO Paris Declaration on OER of 2012, learning resources developed partly or wholly using public funds administered by the DHET will be published under an open licence that encourages their use and adaptation for reuse.
>
> 5.2.3 Teaching Development Grants will be utilised to encourage collaborative development and use of OERs.
>
> (DHET, 2014, section 5.2.1).

### 2.5.3 Open learning policy framework for post-school education and training in 2017

Another relevant piece of South African legislation is the Open Learning Policy Framework for PSET, published in 2017 which set out a vision to increase access to education and training opportunities for all and to construct quality learning environments (DHET, 2017). The motive of this framework is, amongst other aims “to increase access to education and training opportunities for all and to construct quality learning environments which take account of learners’ context and use the most appropriate and cost-effective methods and technologies” (DHET, 2017: 367).

Section 2.2.4 of the policy recommends increasing growth in the use of OER, open licensing policies and OER repositories in both school and post-school education and training, to always be led by public policy and enabled by the use of ICT in material development, to change the picture of education and training (DHET, 2017: 375). It intends to achieve this in many ways, for example, by encouraging HEIs to “maximise the use of appropriate digital technology; collaborate and share infrastructure; embrace OER and the sharing of materials and resources; and build staff capacity in the use of Information Communication Technologies (ICT) for teaching and learning’’ (DHET, 2017:375).

### 2.5.4 University of South Africa (UNISA) open educational resource (OER) strategy

UNISA has developed an OER strategy within the framework of its alignment with both the South Africa's Policy for the Provision of Distance Education in South African Universities in the Context of an Integrated Post-School System (2014) and the White Paper for PSET (2013). It has set strategies to improve both school and post-school education and training. Cox et al. (2016:154) declare that the UNISA OER strategy was developed to integrate external OER into UNISA courses in order to share internally developed course materials as OER.

The UNISA OER strategy priority 3 specifically refers to the "Systematic integration of high quality, available open educational resources into courses and their subsequent release for use by others" (UNISA OER Strategy 2014-1016:11). The strategy priority 3 does not only aim to integrate external OER into UNISA courses, but also to encourage the creation of OERs within UNISA. This priority will position UNISA to shift from being a consumer of externally created OER to producing its own OER. These shifts will lead to a teaching practice transformation that will lead to quality teaching and learning.

## 2.6 Principles of OER use

Scholars like Wright (2018) and Wiley (2014) identify principles associated with the OER. An OER principle can be defined as the specific characteristics that set OER apart from other teaching and learning materials. The study was able to identify several OER principles which are indefinable when OER is being used in teaching and learning. Wright (2018:194) indicated that access, format, and license are the general characteristics of OER. Additionally, Wiley (2014.np), posits that to be considered an open resource, an Open Educational Resource should include the following 5Rs of Openness to ensure open licensing:

- Retain: the right to make, own, and control copies of the content. (e.g., download, own, store, and manage)
- Reuse: the right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video);
- Revise: the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language);
- Remix: the right to combine the original or revised content with other open content to create something new (e.g., incorporate the content into a mashup);
- Redistribute: the right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend).

RETAIN is to conserve the resource in its original form. An original resource or revised resource is shared with others without being altered.

REUSE is to use the resource in its original form without effecting any changes. An original resource can be used as a website or as a video into a teaching and learning situation. The only requirement is to acknowledge (“attribute”) the source as required by the open licence (Butcher et al. 2015:43).

REVISE is to alter a resource in order to dispose with a new teaching and learning situation. An original resource may be translated from one language to the language suitable for the new teaching and learning situation. Examples include reworking the wording so that it can be understood by local learners, replacing case studies with ones that refer to contexts closer to home, and swapping out images and photos with local examples (Butcher et al., 2015:43).

REMIX is to assemble resources into a totally new teaching and learning resource. Two or more resources are combined to create a new teaching and learning material. Butcher et al. (2015:43) suggests an example of the construction of three lessons that making up a course.

REDISTRIBUTE is to make accessible the original resource, revised resource to others. An original resource or revised resource is shared with others.

### 2.7 Structural, Cultural and Agential Factors Influencing the Use of OER

Research on the factors influencing the use of OER in teaching and learning has confirmed that OER pedagogy is transversal. A number of factors make the use of OER in teaching and learning more user-friendly. OER have a promise to provide HEIs with meaningful benefits, whilst there are still various aspects to be noted in taking a decision whether or not to use them (Madiba, 2018:49). From the above it is evident that the use of OER must be supported to overcome barriers. The careful planning for the use of OER, done while considering factors like structural, cultural and agential as enablers of OER, can help HEIs avoid many pitfalls associated with the use of OER in teaching and learning. A number of scholars identified the factors that enable the use of OER in teaching and learning, including structural, cultural and agential factors (Hodgkinson-Williams, Arinto, Cartmill and King, 2017; Cox and Trotter, 2017).

#### 2.7.1 Structural factors

It is the structural factors that sustain OER use in most of the HEIs. Cox and Trotter (2017:291) define structure as those external factors, including national and institutional infrastructure, computer and internet-related technologies, intellectual property policies and OER repositories and platforms elements that shape an individual action. Structural conditions have

to do with the government and/or institutional policies, systems and infrastructure (Hodgkinson-Williams, Arinto, et al, 2017:33). The government and institutional policies should be proactive in legislative guiding the national and institutional infrastructure, computer and internet-related technologies, intellectual property policies and OER repositories in order to enable the use of OER in teaching and learning. The formulation of new legislation and amendment of current legislation to enable the mentioned structural factors to assist HEIs in adopting OERs is crucial. Access, availability and permission have been identified as the structural factors enabling the adoption of OER.

#### 2.7.1.1 Access

According to Madiba (2018:23) poor ICT infrastructure is one of the obstacles to accessing OER material in HEI repositories. The use of OER and any other educational technologies is dependent on sufficient technological infrastructure and stable electrical supply. The sustainability of the use of OER hangs on the solid global communication networks infrastructure that the Internet continues to provide (Madiba (2018:27).

#### 2.8.1.2 Availability

Raneri and Young (2016:581) observed the huge increase of accessible OER since they were openly licensed. The free availability of OER on the net does not often translate to their usage. In spite of the free availability of OER on the net, there is insufficient evidence of their integration or usage in teaching and learning activities (Mtebe, et al., 2014:249). Notwithstanding their great potential, many researchers and lecturers are still doubtful of the effectiveness of OER (Veletsianos, 2015:200). Lecturers are still sceptical about the quality of OER.

#### 2.8.1.3 Permission

One of challenges facing many faculty members is uncertainty about the copyright of the content they produce while in the employment of an institution (Karipi, 2020:28). The availability of institutional policies guiding the use of OER in teaching and learning will influence institutional activities around OER. McAndrew (2010:2) posits that the acceleration of OER sharing relies on open licensing and the use of open software that are guided by copyrights, enabling free access, use, sharing and modification of such educational resources.

### 2.7.2 Cultural factors

Cultural factors are one of the influential factors on the use of OER at HEIs. Cox et al., (2017:292) refers to culture as the environment characterised by the beliefs and norms of the (university) communities in which lecturers find themselves. These authors also identify collegial institutional culture, bureaucratic institutional and managerial institutional culture as the influential cultural factors.

#### 2.7.2.1 Collegial institutional culture

The basis of cultural collegiality is shared values, at both individual lecturers' level and within the academic unit, and exposes mutual understanding (Macfarlane, 2016:32). The culture of sharing and collaboration enables the use of OER in teaching and learning. Cox et al. (2016:151) indicate that effective implementation of institutional policies protects the institutional scholar's freedom when they are provided with an opportunity to participate in policy-development process.

#### 2.7.2.2 Bureaucratic institutional culture

According to Cox et al. (2016:151), the bureaucratic institutional culture is distinguished by a top-down management structure which bounds lecturers to extensive policies and regulations that are not contributing to the institutional vision. The bureaucratic institutional culture assists in the use of OER in teaching and learning as the policy formulation of this top-down power structure embraces OER. The features of the bureaucratic institutional culture, which generally reflects social values, are constrained by general societal morals, norms, customs and traditions as well as by being hindered by traditions as well as bureaucrat attitudes, general societal morals, beliefs, and habits they obtain through education, training and professional development and intellectual and ideological coercion (Zafarullah,2013:932).

#### 2.7.2.3 Managerial institutional culture

The feature of managerial institutional culture is solid policy encompassing the needs of all stakeholders in order to collectively enhance collaborative accomplishment of organisational objectives. Žukauskas, Vveinhardt, and Andriukaitienė (2018:20) suggests that management institutional culture is the way by which the company is managed and influenced by the surrounding culture. In this environment, strong policy development is essential if academics are to engage with OER at any significant level (Cox et al. 2016:152).

### 2.7.3 Agential factors

The lecturers are core in the use of OER in teaching and learning as they are at the coalface of teaching and learning. Cox and Trotter (2017:292) view agency as the lecturers' personal capacity to choose a course of action which may or may not include OER adoption. They have identified awareness, capacity and values as agential factors enabling the use of OER in teaching and learning (Cox & Trotter, 2017:296).

#### 2.7.3.1 Awareness

Sufficient awareness among lecturers on OERs and their use in teaching and learning is a requirement for widespread use of OER in teaching and learning. HEIs employ extensive awareness programmes on the use of OER in their faculties to enhance the popularity of OERs. Kurelovic (2016:138) suggests that relevant programmes need to be initiated in order to raise awareness levels among people for OER to gain popularity and acceptance at all levels. Much still need to be done to bring forward the development and use of OERs in a number of teaching and learning platforms (Bliss, Robinson, Hilton & Wiley, 2013:1).

#### 2.8.3.2 Capacity

HEIs' capacity to share, create, store and apply OER in their daily teaching and learning is positively impacts the use of OER in teaching and learning. HEIs faculties' understanding on the integration of OER in teaching and learning is also an enabler of OER adoption. "If faculty members upgrade themselves through the availability of the vast array of OER courses, their understanding on how to integrate OER in teaching and learning will improve'' (Karipi, 2020:23). Provision of continuous orientation on the use of OER in teaching and learning is a primary enabler for the use of OER in teaching and learning.

#### 2.8.3.3 Values

The continuous encouragement and support of the use of OER by HEIs assists in strengthening the personal values of lecturers. Adendorff, Mason, Modiba, Faragher and Kunene (2010:127) define values "as beliefs about the merit or relative importance of different experiences and actions''. Lecturers with positive values embrace the use of OER as they will be seeking teaching and learning approaches leading to positive and comfortable learning processes for their students. The personal values of the lecturers orientated towards OER use can be seen as one of the enablers of OER adoption in HEIs.

## 2.8 Integration of OER in teaching and learning

HEIs around the globe are increasingly recognising OERs, necessitated by the HEIs' need to raise their profiles, improve the quality of teaching and learning and access to education (Nikoi, Rowlet Armellini & Witthaus, 2011:191).

The recognition of OERs has brought with it challenges to higher education institutions in making education more flexible. James & Bossu (2014:83) agree, pointing out that the use of OER and the viewpoint of making education flexible require higher education institutions to:

- subject teachers and students to greater knowledge on OERs.
- increase and nurture digital abilities among students and teachers to increase students' interest in OERs as well as teachers' motivations to produce OER.

Higher Institutions of Learning can take the form of traditional face-to-face higher institution; where students attend lectures, Open Distance Learning (ODL) and blended learning mode. ODL is available to students who, for many reasons, cannot afford the tradition higher education. Such reasons may include lack of time, funding or for old age. ODL is considered the most viable means of making access easy for all students including formally employed students who may not be able to obtain higher education qualifications if their only option was full-time contact tertiary institutions (Letseka and Pitsoe, 2013:194). Blended learning consists of classes where a part of the traditional face-to-face instruction is replaced with web-based learning. This type of learning is also called hybrid or mixed mode learning. In blended learning the amount of face-to-face instruction varies with class, discipline and objectives of the course.

This study is targets all the three forms of learning mentioned above, because they can all benefit from OER.

The increasing interest in OER in higher education is dated back to the MIT Open Courseware's (2002) vision of "unlocking knowledge and empowering minds". This vision is hinged on the Nikon et al (2011) belief that "all human beings are endowed with a capacity to learn, improve and progress", and supported by the Cape Town Open Education Declaration (2007) that claims "education must be accessible to all without constraint".

Scaling up teaching and learning capacity in institutions by adopting and adapting new learning materials and converting the available materials to OER is not as straight forward as it sounds, but could as well be an advantage in the African context. The creation of OER is said to have increased the workload at some African institutions, which is against one of the goals of OER; to reduce the workload. Whereas, academics in Africa are more overworked and overwhelmed than before (Bossu & Tynan, 2011:261). Given that OER are not universally

relevant, it is awkward to think that all OER created by international users can be relevant to Africa (Ngugi 2011:284). Ng'ambi and Luo (2013:223) then argue that in view of the high amount of effort needed for re-purposing OER use would reduce and the interest to produce own resources would increase.

### 2.9 Research on OER in teaching practice

Africa based research on the relationship between OER and teaching practice is still in its infancy. The little research done on OER and teaching practice in Africa explores both secondary and higher education institution contexts.

Olufunke and Adegun (2014) conducted a study on the utilization of OER among undergraduates in universities in Nigeria. Their study further examined the extent to which the utilisation of OER could affect quality of education. Their research findings included the usage benefits of OER like enhanced sharing of common knowledge, course structure, access to quality learning materials and use of real instructional materials online. In their research project, Mtebe et al. (2014) investigated the uptake of OER in HIEs in Tanzania. They found that effort expectancy had a significant positive effect on the lecturer's intent to use OER. In another study, Mtebe et al. (2014) examined the perceived barriers to the use of OER in higher education in Tanzania and found that the lack of access to computer, lack of skills in creating and/or using OER and low internet bandwidth are main hindrances to the use of OER.

OER have the potential to enable equitable access to quality teaching and learning that is characterised by sharing of resources and collaboration amongst lecturers and students. An extensive study was carried out in Kenya by Pete, Mulder and Neto (2017) to examine differentiation in access to, and the use and sharing of OER among students and lecturers at Kenyan universities. The study revealed that there is a remarkable digital differentiation among students and lecturers at urban versus rural areas regarding internet access and computer skills. The study further found that awareness and appreciation of the OER concept is low.

Mutambanengwe, B. K., & Kadada, (2016) investigated the extent to which Zimbabwe Open University (ZOU) academic staff and students utilise OER. They concluded that that ZOU tutors and module writers make use of OER as resources for tutoring and module writing. Findings from the study indicate that even though the academic staff and students utilise OER, there was no evidence to show that they posted content on OER.

In the words of Lesko (2013:118) "Further research is needed with university authorities in South Africa to understand how they perceive the value of using OER or producing teaching resources as OER or OCW.'' In support of the latter statement, research studies undertaken

(Lesko, 2013; de Hart, et al., 2015; Van Der Merwe, 2015; Cox et al., 2017) highlight the need for an OER policy that will adequately guide the educational institutions in taking advantage of OER benefits in teaching and learning. Lesko (2013) concluded in his study that the use of OER in teaching can have a significant impact on quality of teaching and learning materials which will then benefit the students.

A study by de Hart et al., (2015) focused on uptake of OER by staff in UNISA. Their findings included the need for Higher education institutions to evaluate its maturity and that of its staff derived from the uptake of OER in order to guide planning and implementation. The survey further revealed that there is knowledge and understanding of OER at UNISA.

Madiba (2018), in his Masters dissertation, investigated the perceptions and experiences of some lecturers from the UFS with regard to the integration of OERs in teaching and learning. His findings included the need for the UFS to properly introduce OERs in order to enhance the use of OER and its integration in teaching and learning. The study also revealed that though there is still a lack of awareness of OER by lecturers, there was evidence of sporadic use of OER.

### 2.10 Conclusion

OERs have in the last two decades gained much attention all over the world for the promised ability to increase access to education. The world population, particularly those in remote areas, disabled learners and other learning disadvantaged communities can benefit from learning activities in which OER plays a pivotal role. OER does not only provide benefits to the learning communities through learning activities but the learning communities are provided with that opportunity of taking charge of their own learning. According to Hanna & Wood (2011:540), the possibility of OER encouraging lifelong learning and individualised learning practices has seen it gaining more attention. Olcott (2012:283) asserts that there is collaboration between high quality OER organisations with many governments, universities, scientific and cultural organisations engaged in OER advocacy, policymaking, funding, use and expansion.

OER expansion tends to depend much on collaboration between the different partners involved in it. Similarly, the importance of OERs to teaching and learning lies in the knowledge sharing among different participants. Evertse (2011:3) argued that the sharing of educational resources contributes to greater innovation, access and growth in higher education. Though collaborative practices and knowledge sharing play a pivotal role in the expansion of OERs, it is through the willingness to share and collaborate among the OER participants that its

expansion can be achieved. Clement and Pawlowski (2012:7) also agree that for OER re-use to be a dynamic and successful process, there is a need for trust and willingness to collaborate. Sufficient willingness to share knowledge and collaborate among OER participants is necessary, in order to materialize the promise and potential of OER.

## CHAPTER 3: CONCEPTUALISATION AND CONTEXTUALISATION OF OER AS EDUCATIONAL RESOURCES IN TEACHING AND LEARNING

### 3.1 Introduction

In the previous chapter, theories underpinning the study, higher education in South Africa after 1994, specific legislation in South Africa with regard to OER, principles of OER, factors enabling use of OER, integration of OER in teaching and learning and research studies in OER were discussed. This section of literature review starts by focusing on the conceptualisation of OER. The purpose of the literature review is to explore views of various scholars on the challenges associated with the use of OER in teaching and learning.

Secondly, the this section of literature review explores various research studies conducted so far in respect of the use of OER at universities. The purpose of this literature review is to determine “knowledge gaps” and try to shed light into inconsistencies in as far as research on the concept of OER is concerned. Furthermore, emphasis is laid here that the rise in the use of OER in teaching and learning, can be attributed to clarifying numerous factors such as conceptualisation of OER, the use of OER in teaching and learning, challenges on the use of OER and institutional policy and support of OER. In the light of what has just been stated, this chapter looks into foregoing factors.

### 3.2 Historical background of OER

The history of OER dates as far back as 1994. It started with the coining of the term learning objects by Wayne Holdings (Deimann & Farrow, 2013:02). The exceptionality of the term is the idea that digital resources are planned and produced in ways that allow their adaptation in different instructional situations (Onaifo, 2016:02). The beginning of 1998 saw the coining of the term ‘open content’ by David Wiley (UNESCO, 2012:2). The coining of the term ‘open content’ in the history of OER further diffused the idea of openly sharing learning resources and making them freely available for others to use.

OER had its beginnings at the OpenCourseware conference for higher education in developing countries hosted by UNESCO in 2000. In 2001 the MIT took a giant leap by initiating a tradition of making course materials used in teaching freely available on the web to every user worldwide. This OpenCourseWare initiative became a key player in the history and development of OER.

One of the roles played by the MIT OpenCourseWare initiative brand in the history and development of OER was to bring together stakeholders interested in the MIT OpenCourseWare. Kanwar and Uvalic (2011:23) declare that the term OER was first used at

UNESCO's 2002 conference on the impact of Open Courseware for Higher Education in developing countries. The 2002 UNESCO forum adopted the term OER and defined it as "*technology-enabled open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes*". This initiated a trend for all educational materials made freely available on the net and regulated under an open licence or CC to be referred to as OERs. The USA is currently at the forefront with regard to OER initiatives globally. Meanwhile, other countries outside United States of America (USA), for example India, have had their HEIs develop OERs introduced as National Programme in Technology Enhanced Learning (NPTEL) (Das, 2014:20). The William and Flora Hewlett Foundation (2010), is an influential body that has also entered the fray by asserting the potential of OERs in providing equity in teaching and learning (McGreal et al, 2013:xvii).

### 3.3 Conceptualising OER

The emergence of educational technologies makes it impossible for the teaching and learning landscape to continue to use older approaches. The shift to technology-enabled lecturing has transformed the outlook of lecture rooms at HEIs. The rise of OERs in pedagogy has enabled HEIs to access high quality educational materials. There are various conceptualisations of OER, extending from those focused on the concept of 'open', the sharing of resources and use of OER.

While the concept 'open' is vague, it has been of central advantage to the building of the OER movement. The knowledge of this concept is crucial to the OER movement as it is frequently misunderstood to mean "free of charge" (Johnson, Becker, Estrada & Freeman, 2014). The concept of 'open' as defined by Jhangiani, and Biswas-Diener (2017) refers to 'allowing access to'. Many countries are taking advantage of the emergence of the concept of 'open' by increasing involvement in knowledge sharing. This has led to new teaching approaches in which the education domain is steadily adopting and accepting the presence, growth and influence of this open movement (Olcott, 2013). The open movement is directed by the sharing of resources in order to support creative intellectual growth in a generational context and with global influence (Kelly, 2014).

The open movement rests on collaborative environments associated with teaching and learning where users share resources to enhance knowledge creation. UNESCO (2012) highlights the sharing of resources with no or very few restrictions. The sharing of resources must be built on effective digital competencies of the users to enable them embrace the new approaches to teaching and learning. Tosato, Arranz and Avi (2014:212) views sharing resources as essential. This is because they support the creation of post sharing, comment

and material rich networks among users. This resource sharing creates more equitable access to OERs, even for users in informal teaching and learning environments. This conclusion is based by Mishra (2017:371), who declares that the concept of OER subscribes to the practice of resource sharing which enhances teaching and learning and innovations in teaching ().

The concept of OER envelops the proposal that open web repositories should provide opportunities for everyone to share, use and reuse knowledge as a public good. This study will accept the Hodgkinson-Williams, Arinto, Cartmill and King (2017:41) definition of "OER use". To them, this term captures the reuse of the resources in their original forms. Wiley (2015:6) suggested the 5Rs (Retain, Reuse, Revise, Remix, and Redistribute) which enable the use OER. This 5R concept means that OER-enabled pedagogy evolved from being defined in terms of copyright issues to be more focused on the relationship between 5R activities and teaching and learning practices (Wiley & Hilton III, 2018:135). OER-enabled pedagogy enhances the collaborative teaching and learning environment. This type of pedagogy enables users the capacity to direct how their work is used by others, through Creative Commons licensing (Williams & Werth, 2021:4). OER-enabled pedagogy encourages life-long learning through problem-based learning (PBL). In PBL context, "students use their previous knowledge, discuss, interact, seek new knowledge and integrate their results with a group, with the help of a tutor" (Brown, Nic Giolla Mhichil, Beirne, & Costello, 2020:894). Based on the above argument, it can be concluded that the traditional teaching and learning approach needs an overhaul because students have to be at the centre of knowledge creation.

### 3.4 OER-enabled pedagogy

It is suggested that lecturers need to be effectively orientated in understanding the concept of OER-Pedagogy and its effective implementation in the classroom. OER-Pedagogy "is a set of teaching and learning practices that are only possible or practical in the context of the 5R permissions which are characteristics of OER.'' (Wiley and Hilton III, 2018:135). The 5R permissions mean that the OER user is involved in either building upon a task done by another user or creating a new task which permits other users to transform and adapt it (ibid, 2018:136). "What open pedagogy affords, in contrast to closed pedagogical approaches, is an increase in autonomy on the part of the learner, both in terms of the resources they use to support their learning and the software, services, and platforms they choose to create and share their works" (Paskevicius and Smart Learning Environments, 2019:3).

OER-Pedagogy offers teaching and learning guidelines and effective mediating to the learning process. It incorporates many learning and teaching theories, focused on collaboration and

student empowerment (Bridgeman, 2020:15). OER-Pedagogy supports the (re)use and production of high-quality OER through institutional policies, promotes innovative pedagogical models, and respects and empowers learners as co-producers on their lifelong learning path (Open Educational Quality Initiative [OPAL], 2012:3). The central purpose of OER-Pedagogy is the students and not the lecturers.

The integration of OER with pedagogy to enhance teaching and learning depends on ICTs.. Consequently, the reliability of the internet connection plays an important role in the delivery of an effective OER-Pedagogy. Mallinson and Krull (2015:263) also opine that the speed with which OER consistently becomes part of daily teaching and learning depends on the reliability of the ICT infrastructure as the reinforcing feature. However, given their importance, this researcher opines that the ICT infrastructure should be seen as an integral part of OER-Pedagogy and not merely as a reinforcing agent. ICTs are a tool used to facilitate knowledge construction in the OER-Pedagogy. Heinen, Kerres, Schamberg, Bleest and Rittberger (2016:1) also suggests that the use of different digital platforms as instruments to search for educational resources in the teaching and learning process has been proven to intensify learning in both lecturers and students.

Drawing from the above, the entrance of OER in universities is still a challenge to lecturers since they need to review their teaching methods and curriculum design. OER-Pedagogy is not a teaching and learning theory but the improvement of learning experiences through utilisation of open teaching approaches. Paskevicius (2017:126) perceives OER-Pedagogy as the teaching and learning practices allowed and assisted by the open movement which are using OER, exposing students to openness. OER-Pedagogy is specifically designed for universities and organisations, in order to encourage the examination of the educational effects of open learning, learning theories like socio-cultural theories. Cognition information processing should be seen as a conceptual tool that offers angles through which to investigate learning with OER (Panke & Seufert, 2013:131). This makes provision for lecturers to have ample choices in the utilisation of theories that are suitable for their teaching styles and students' learning styles. Cronin and MacLaren (2018:127) concur that the educational literature lacks adequate research on OERs, particularly from the growth perspective.

### 3.5 Artefacts supporting the use of OER

HEIs can integrate OER into teaching and learning. However, studies show that lack of knowledge around the use and adoption of OER digital skills in teaching and learning can negatively affect the pursuit of quality teaching and learning in general (Benali, Kaddouri & Azzimani, 2018:99). Perryman (2013:4) asserts that lecturers' poor Internet use skills slow

movement towards the full adoption of OERs in HEIs. Existing research shows that lecturers with limited internet skills do not often aspire to take part in different OER and implement OER-integrated teaching and learning (Ibid). A number of strategies can be used to enhance OER usability. The availability of assets at HEIs, particularly in digital form, enables access to students and self-learners who cannot afford printed teaching and learning materials. The emergence of computing technology has led to a new kind of prevalent artefact in human's daily lives: digital artefacts (Gruning, 2018:2). The role of digital artefacts in teaching and learning is critical because it can transform traditional learning into individualised learning since students can learn in different ways and achieve different learning outcomes (Bates, 2015:447). Digital artefacts have become an important part of teaching and learning life as they lay a foundation for teaching and learning. Mwangi (2018:25) further classifies digital artefacts into different types of OER which include audio podcasts, slides and class presentations, electronic books (e-Books), electronic journals (e-journals), open courseware, interactive games and simulations, and video lectures/tutorials.

### 3.5.1 Video podcasts,

Borko, et al., (2010:176) note that videos can be used to produce a shared occurrence, serving as a centre of attention for teachers' collaborative observation of the central activities of teaching. Podcasts can also be documented as video formats in order to provide the user with a visual feature and expressions to support their self-study after classroom teaching and learning (Mwangi, 2018:25). They serve as an additional source of experience for teaching and learning at HEIs. Ronchetti (2010:45) points out that video lectures/tutorials have the ability to help working-students by bridging the gap caused by their absence during regular lectures. Video lectures /tutorials support regular students by giving them the opportunity to recover lectures lost due to forced or elective absence. Students can also review critical sections and check their notes (ibid, 2010:45).

### 3.5.2 Audio podcast

Podcasts are digital files (usually audio and/or video) that are openly available for users on computer or a portable device to be used at a later time (Spies, 2011: 1169). Mwangi (2018:25) points out that digital files in audio format can be stored on a network server and be made available for listening on an audio device. Students can listen to the stored digital files during teaching and learning in order to improve the instructional experience. Audio podcasts are effective qualitative teaching and learning resources that can be easily used, adapted and re-used to suit the teaching context. Students are opportune to freely access them on the net

and listen to concepts that were already dealt with in class. The teaching and learning goals are easily met, given the proactive enhancement of these digital tools.

### 3.5.3 Photographic images

Photographic images are images salvaged by uncovering a sensitive surface to light usually taken through the use of a camera (Alenizi, 2015:15). Triacca (2017:1) indicates that lecturers usually adopt visuals to support oral presentations, make the concepts clear and situated, and facilitate focusing on relevant elements. The use of digital photographs and images requires students to create their own knowledge in activities supported by visuals representing the learning outcomes. Students who are exposed to photographic images are opportune to take charge of their own teaching and learning, constructing their own knowledge according to their pace.

### 3.5.4 Electronic books

E-books are a move from print to electronic. They can be retrieved through a tablet, computer, phone, or e-reader (Van Schalkwyk, 2017:12). Zinn and Langdown (2011:104) note the two main types of e-books: those whose origin is digital source and those which have been digitised, that is the process of creating digital files by scanning or converting analogue materials. E-books are aligned with the use of OER in teaching and learning as compared to print text books which are not freely available and cannot be reused and adapted. E-books are made available either in digital or in digital files and can either be freely acquired. The difference between an e-books and a print textbook is that the printed textbook is electronically digitised and produced in such a way that it can displayed, accessed, published on a desktop computer, on any hand-held device with screen or in any custom-designed electronic gadget. (Tosun, 2014:21)

### 3.5.5 Games and simulations

Simulation can be seen as a teaching setting wherein students are placed in a ‘world’ as clarified by the lecturers. Simulations are a kind of experiential learning (Hough (2012:978). The experiential learning environment produced by simulation enables students to experiment realistic situations in teaching and learning settings. Simulation is a specific way of using a single activity to obtain knowledge about another process being simulated (Petersen, de Beer & Dunbar-Krige, 2011:74).

### 3.5.6 Electronic Journals

Ariffin and Bakar (2013:976) define an electronic journal (e-journal) as a digital version of a journal or intellectual magazine that can be retrieved through electronic transmission. They note that electronic journals play a major role in educational work of academics and are one of the most favoured instruments apart from printed materials. The emergence of electronic journals brought with it a new lease for librarians and academics. Thanuskodi (2011:3) confirms that librarians have been granted a powerful tool to support learning and research ibid (2011:3). The advent of electronic journals has simplified access to journals and saves time.

## 3.6 Developing and enhancing course material

Chao, Saj, and Hamilton (2010:107) made an observation that individual lecturers are responsible for course design and development in most traditional HEIs. The introduction of OER has led to transformations in course design and development at universities. University course design and development is currently more collaborative and there is more consultation in the design and development process. Lecturers and instructional course designers collaborate in drawing interactive course outlines. Course material development and enhancement through OER integration requires emphasis on the enhancement of lecturer's capacities, thereby enabling knowledge transformation. The integration of OER to enhance knowledge sharing in teaching and learning is important for human capacity and knowledge transform in universities. Course material development and enhancement for OER use in teaching and learning are vital because they can enable a change in the teaching and learning methods in the classroom.

Course material refers to tools offered by lecturers to students in different settings during the teaching and learning process (Bakır, 2020:266). Course material development at universities should enhance the effective and interactive teaching and learning, thereby enabling quality student success with little or no support from lecturers. Pande (2018:339) highlights that OER provides a chance for the development of high quality material instantly and also in a way that is inexpensive. OER also permits lecturers to design course material that is customised for their students (ibid, 2018:339). The use of online tools by lecturers and students has the advantages of time and location freedom associated with online learning (Dhawan, 2020:15). Teaching and learning with the use of OER can be demanding, since it need lecturers to possess different teaching skills and technologies.

### 3.6.1 OER course development framework

The OER Course Development Framework is a collaborative process of course development in the higher education landscape (Chung & Khor, 2015). It requires technical staff, course designers and external assessors to use the subject expertise provided by the lecturers to design courses that integrate OER. The adoption of an OER Course Development Framework relies on the designing of a high-quality course. Using OER in this regard may increase the best features of both face to face and on-line learning.

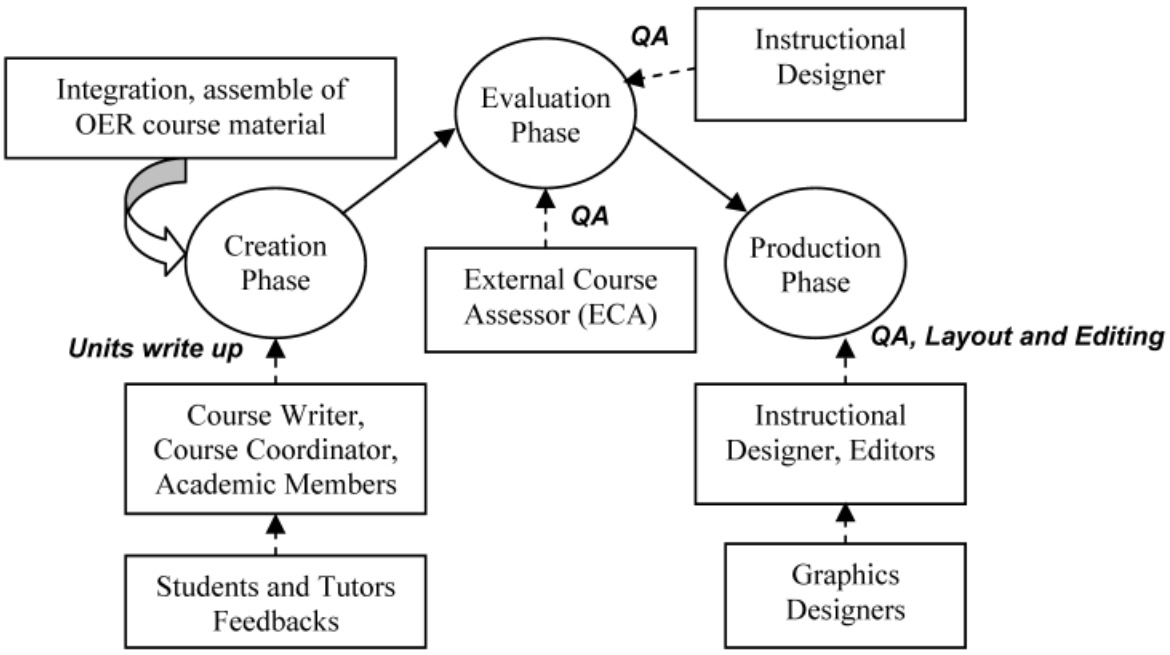


*Figure 3. 1: OER Course Development Framework by Chung and Khor, 2013*

The above OER Framework contains three phases: the creation phase, the evaluation phase and the production phase. The creation phase aspect is organised with the following elements of relevance: course writer, course coordinator and academic members. The creation phase dimension is continually informed by report back from students and tutors. The production phase dimension is also structured with the following elements of relevance: instruction designers and editors who are assisted by graphic designers (Teng & Hung, 2013:317).

### 3.6.2 5R open course design framework

The 5R Open Course Design Framework primarily focuses on enhancing course material development for universities. Course material development is the integral part of university teaching and learning. The modern teaching and learning environment requires flexible education, in order to cater for the teaching and learning needs of individual students. Course

material development has become key in enhancing adaptive teaching and learning at universities. The aim of the 5R Open Course Design Framework is to improve customised and personalised mobile learning through combining context information to construct a context aware mobile computing architecture (Tan, Zhang, Pivot, Evans, Kinshuk & McGreal, and 2016:972). This framework is geared towards assisting lecturers acquire competence in using OERs to enhance student learning. It provides lecturers with the ability to develop and license course material in various "open" levels (ibid, 2016:972).

The CC licence which provides for the release of OER, allows open licensing or Wiley's "5R" permissions (retain, reuse, revise, remix and redistribute) to vitalise creating and recreating information in the classroom. In terms of this framework, users may *retain* the resources which offer the user the right to make, own and control copies of the content. *Reuse* gives the user the right to use the content in a wide range of ways. *Revise* offers the right to adapt, adjust, modify or alter the content. *Remix* means the user can combine the original or revised content with other open content to create something new. Finally, *redistribute* gives the user the right to share copies of the original, the revised or the remixed resources (Bliss & Smith, 2017:12).

Karunanayaka, et al., (2017) explored the impact of integrating OER in teacher education at the Open University of Sri Lanka. Their study found that lecturers are empowered to move from low level to high level degrees in the use and creation of instructional resources. They further indicate that lecturers in developing course materials are enabled by Wiley's "5Rs" permissions framework associated with OER. Wiley's "5Rs" permissions framework is not only necessary for enabling universities to reduce cost, but is also useful for HEIs to be effective in supporting lecturers in the use of OER.

### 3.7 OER models

Most teaching and learning approaches include the use of various models of education. The discussion below will focus on models that represent the use of OER in teaching and learning.

*Table 2. 2: Models in use in OER initiatives (adapted from Wiley, 2007b)*

| | **MIT Model** | **USU Model** | **Rice Model** |
|---|---|---|---|
| Course production goals | All courses offered by MIT | Many courses offered by USU | Many courses offered anywhere |
| Control over courses produced | High degree of control | Small degree of control | Practically no control |

| | | | |
|---|---|---|---|
| Cost per course produced | USD 10 000 | USD 5 000 | USD 0 |
| Organisation size | Large | Medium | Small |

### 3.7.1 Massachusetts Institute of Technology (MIT)

The introduction of the Open CourseWare (OCW) project at the Massachusetts Institute of Technology (MIT) in 2001 has contributed towards elevating MIT to one of the most recognised HEIs offering a wide variety of both formal and informal courses. A number of these courses allow anyone, anywhere in the world to access them via the Internet. In 2016, the MIT's OCW celebrated fifteen years of offering Open Sharing and more than 100 courses with instructor insights were offered (MIT OCW, 2017:1).

Launched in 2003, OpCW consists of materials for more than 2,080 MIT courses (Carson**,** Kanchanaraksa**,** Gooding**,** Mulder**,** & Schuwer, 2012:2). The OCW project aims to share course materials which include lecture notes, assignments, syllabi, and exams from virtually all of the Institute's classes, 'freely and openly' on the Web (West & Vctor, 2011:19). Through the main MIT OCW site (http://ocw.mit.edu20) and through translation affiliate sites, OCW materials have been accessed by an estimated 50 million individuals from more than 200 countries and territories worldwide (ibid, 2011:19). Madiba (2018:39) asserts that the idea behind the establishment of MIT's OCW initiative was to design and make courses freely available. Chidinma (2013.3) also points out that "the aim was to "enhance human learning worldwide by the availability of a web of knowledge."

The MIT OCW's contribution to enhance education and access to knowledge cannot be overemphasised. This model has paved the way for freely available courses to universities around the world. Johannsen and Wiley (2010:2) note that over 200 HEIs across the world are members of the OCW Consortium involved in open publishing 8,000 courses in a variety of languages.

OCW is serves as a useful resource with translated courses produced in collaboration with five partner organisations. The partners translate the OCW course materials into languages such as Spanish, Portuguese, Simplified Chinese, Traditional Chinese, Thai, Turkish, and Persian (Vladoiu, 2012:1).

### 3.7.2 Utah State University (USU) OCW

The Utah State OpenCourseWare is a collection of educational materials used in formal campus courses. It aims to provide the global population with an opportunity to access quality teaching and learning opportunities (West.et al., 2011:21). The important aspect of the USU OCW model has been identified as the lecturer's active participation in the use of OER in teaching and learning. This model aims to maintain the publishing of more courses in the USU course catalogue. USU provides a diversity of OERs that are used by researchers, lecturers and students in both formal and informal teaching, learning and research activities (Utah State University, 2017:n.p.). Arendt (2010:2) noted that the Utah System of Higher Education and Utah State government views OCW as relevant and impactful to teaching and learning as they included it in their 2007/08 budget.

### 3.7.3 Rice model

The model is not approximately decentralised but it also has volunteers providing almost all services and materials. The Rice Model is largely distinctive among OER practicing HEI enterprises (Pena, 2009:4). The model is an example of volunteer-driven open resource communities. Most of the other institutions can implement and further explore this open resource communities. The goal of the Rice model is to enable the collaborative development of educational modules and courses around the world (Wiley, 2007:9). The Rice Connexion model does not target the development of a very large number of courses, thus funding needs are fewer as external authors also contribute to course development (ibid, 2007:9). It should be noted that not all the courses taught at Rice University are involved in the connexion modules and courses.

## 3.8 Challenges to OER use

Although OER is touted as a remedy for problems encountered in teaching and learning practice, there are several challenges, both at the individual and institutional levels, in their use (Orwenjo & Erastus, 2018; Muganda, Samzugi, & Mallinson, 2016). Some of the major challenges to lecturer participation in OER at various stages of teaching and learning in the identified educational institutions:

### 3.8.1 OER awareness

Awareness should be a starting point for creating possibilities for OER use by lecturers. Hodgkinson-Williams, Arinto, Cartmill & King (2017:33) identified this challenge and outlined some solutions. According to the authors, it is essential to raise awareness on OER existence

through social media and OER portals. It is important that potential users are exposed to OER which is certified through some quality assurance processes in those awareness campaigns. Ideally, awareness campaigns are to empower lecturers with legal permission of OER to enable them share their material (Cox & Trotter, 2017:294). Ng'ambi and Lou (2013:233) emphasise that OER seminars should be conducted in an attempt to familiarise lecturers with OER and its supporting structures at their institutions. Cox and Trotter (2017:337) also note that many lecturers do not see the advantages of OER over traditional materials.

### 3.8.2 Technological infrastructure

Technology is another challenge in the use of OER (Mncube, Olawale & Bitso, 2002; McGreal, 2017). Mncube et al. (2013) acknowledge that OER require open technology and open practice, new learning methods and a crucial change in the lecturer. More than often, OERs are produced through technological programmes that are exclusive, therefore preventing those without access from their use. Tlili, Zhang, Papamitsiou, Manske, Huang, & Hoppe (2021:526) assert that these technological restrictions impede the application of emerging technologies OER use.

According to Joseph, Guy & MacNally (2019:356), the development of both proprietary and open software can be of good use for OER creation. However, there are challenges around open software which include little or no access to the internet, connectivity issues and low bandwidth (Mwinyimbegu, 2019; Nkwenti, & Abeywardena, 2019).

Pounds and Bostock (2019), in a study on OER) in higher education, found that OERs are valuable, even though their value still depends on hosting technology and the level of training in technology. According to Shams, Haq & Waqar (2020:5652) the crucial barriers to the use of OER are lack of access to computers and lack of software, lack of access to the internet, lack of skills and lack of time.

### 3.8.3 Copyrights and Intellectual property (IP)

Another issue to emerge out of the literature as a challenge to OER use is the familiarisation of lecturers with intellectual property (Perez, 2017:231). The understanding of Intellectual property by lecturers is important in the education sector characterised by resource sharing. Hodgkinson-Williams (2018:n.p) point out that familiarity with intellectual property mechanisms including Creative Commons (CC) by lecturers is a challenge. The introduction of CC licensing was a response to the restrictive nature of intellectual property laws which emerged with the public internet (Williams & Werth., 2021:4). Many universities are having their intellectual property rights related frustrations mitigated by the introduction of Creative Commons which

permits the re-used, re-mixed and re-distributed of educational resources in transparent forms (Orr *et al*., 2015:18). However, Percy and Belle (2012:4) note that the CC licensing can add more confusion to OER users when teaching and learning content from different sources is mixed. More needs to be done by institutions in making lecturers aware of simple licencing methods like CC Licenses.

It is vital for lecturers to have a clear understanding of copyrights and intellectual property (IP) in order to apply for licenses according to their interests and expedite their search for material availability (Otero Pantazatos, & Docampo (2019:n.p). The access and use of educational materials is often accompanied by an increased risk of violating copyrights and intellectual property laws (Wahid, Saidin & Arif, 2018:152). Educational institutions as well as lecturers are much concerned about violating copyrights and intellectual property laws (ibid, 2018:152).

A study by Yi & Duval-Couetil (2020), which investigated lecturer views of undergraduate intellectual property policies and practices, revealed that lecturers indicate the lack of legal assistance and lack of technology transfer professionals to facilitate the intellectual property issues as main problems. In addition, lecturers who are already in the habit of developing materials are discouraged from becoming OER creators, as copyrights to their work are held by their employers, the institution (Cox & Trotter, 2017:155). Richter, et al (2014:03) also note that from the inception of OER, intellectual property rights have remained a concern. Although most lecturers may be interested in the reuse and adaptation of OER in their teaching and learning activities, the implication is that the intellectual property challenge still needs to be urgently addressed.

Another study conducted by Kursun, Cagiltay and Can (2014:26) revealed that legal issues relating to re-use and adaptation of OER in many countries remain unclear, thereby hampering the development of OER. Institutions of higher learning need to put more effort into familiarising their lecturers with both the local and international laws pertaining to OER copyright issues.

### 3.8.4 Lack of OER skills

In universities, lecturers are often reluctant to use OER in teaching and learning due to their lack of skill (de Oliveira Neto, Pete, Daryono & Cartmill, 2017:109). Frequent lack of the requisite technical skills to find and use OER is one of the major challenges of OER in many universities (Onaifo, 2016:61). According to Mncube, Olawale & Bitso (2021:210) the use of OER is less structured and may offer opportunities for developing skills differently from other teaching approaches. A study by Muganda, Samzugi & Mallinson (2016), which investigated the analytical Insights on the Position, Challenges, and Potential for Promoting OER in ODeL

Institutions in Africa revealed that lecturers need skills to create quality OER materials. Lecturers are therefore challenged when having to integrate OERs in their teaching and learning because their unfamiliarity with the use of OER means they lack the said skills. Furthermore, Mwinyimbegu (2019:154) argues that the available OER information is not sufficient to satisfy the user's information needs. Yet lecturers' availability awareness and skills needed to access and navigate OERs remains important. The poor navigation capabilities cause lecturers to further shy away from experimenting with OER.

OER use and adaptation means putting down an OER into different learning circumstances from that for which it was originally planned and developed (Abeywardena, 2012:5). Most OER users, particularly lecturers, need to use OER to improve their teaching practice but the reuse and adaptation of OER is still not yet integrated into curricula in many countries. Ng'ambi and Lou (2013:235) argue that the teaching value of OER is not yet evident. In addition, Atenas, Havemann & Priego (2014:39) points out that the use of OER repositories and OER in teaching and learning at universities requires a series of literacies and skills. Additional training and technical support for lecturers in digital skills are significantly important (ibid, 2014:40).

### 3.8.5 OER Quality

Despite in the much hyped potential for OERs in teaching and learning, some scholars view OERs differently. In fact, OER use in teaching and learning presently faces challenge related to quality assurance (Reinken, Greiff, Draxler-Weber & Althobait, and 2021:37). Studies (MacGreal, 2017; Atenas, et al, 2014 & Koseoglu & Bozkurt, 2018) have confirmed that the perceived lack of quality assurance in OER remains a challenge. This perceived lack discourages lecturers from using OER in teaching and learning and forces them to lose opportunities of promotion and tenure (Zaid & Alabi, 2021:185). Moreover, the success of any OER creation and usage platform depends on the user community working to maintain and update learning materials. By their work, this community helps invigorate OER use and further improve quality assurances (Van der Woert, Schuwer and Ouwehand, 2015:12).

Many educational institutions perceive OER as still needing to be of a requisite quality and relevance (Mishra & Singh, 2017:453). On the contrary, others indicate that there are currently numerous approaches to OER quality assurance, with different complexities and practicality (Reinken, et al, 2021:37). Kurelovic (2020:0433) has also confirmed the importance of OER to be of high quality by emphasising the establishment of OER quality assurance criteria. Many South African universities have OER repositories which have not yet effected the use of OER in teaching and learning. The lack of quality criteria for OER still remains a barrier to the use of OER in teaching and learning (Koseoglu & Bozkurt 2018:452). The availability of OER

quality assurance criteria has the potential to enable more OER use in South African universities.

Quality issues involved in the use of OER are a concern among lecturers (MacGreal, 2017:299). Appropriate OER quality can enhance the use and adaptation of OER in the teaching and learning context. Atenas et al, (2014: page???) reveal that "the quality assurance of OER is the challenge and the barrier at the same time." Similarly, MacGreal (2017:299) declare that OER quality issues as a concern do not only include subject matter quality, but also quality pertaining to culture and pedagogy.

### 3.8.6 Absence of OER policies

Even though there is still a lack of OER policies at the national level in many countries, many educational institutions have adopted OER policies (Abeywardena, 2017:237). Any attempt to adopt OER for teaching and learning will face challenges and these challenges deserve effective solutions. There is currently a need to make OER an integral part of educational policies and practices from early childhood education to post-secondary, technical vocational educational training, higher education, lifelong learning and teacher training (UNESCO, 2017:1). Scholars (Trotter & Hodgkinson-Williams,2018; Kanwar,2020) also agree that many educational institutions do not have OER strategies or policies, but rely on their Intellectual Policies (IP) to strengthen their national copyright legislation with regard to their possession of copyrights over their lecturers' educational materials.

The institution's IP policies in the teaching and learning sphere determines if the lecturers or the educational institution itself will have a hold on the educational material copyrights enabling open sharing of materials (Cox & Trotter (2017:302). OER emerged out of a series of initiatives which have shown how the impetus in the OER movement has resulted in a number of institutional, local, regional and national policies supporting OER throughout the world, such as policies for the adoption of OER (Juárez & Muggli, 2017:191). However, there are still numerous technical and legal challenges hindering OER creation. It should be recalled that OER involves the complicated IP policies and licensing processes that give educational institutions copyrights over teaching and learning materials (Arinto, Hodgkinson-Williams& Trotter, 2017:587). This implies that lecturers at universities do not hold copyrights over their created teaching materials and are therefore, hindered from legally sharing these materials as OER without the permission of the institution (Cox & Trotter, 2017:294).

Since OER function on the basic principle that research and educational resources are common goods that should be made available to benefit everyone, the OER movement pursue definite policies that support Open Access and OER at governmental and institutional levels

(Toledo, 2017:124). Moreover, the availability of official institutional OER policy hold promise to potentially influence the revision of other policies such as recruitment and promotion(Abeywardena,2017:237). Van der Woert,et al., (2015:58) is of the opinion that the presence of OER policies at universities can assist to enhance the OER adoption process. In addition Kelly (2014:2) agrees that the acceptable way of developing OER policies make certain that there is justifiable creation and support of these OERs.

In a study conducted by Arinto, Hodgkinson-Williams & Trotter (2017) on OER and OEP in the Global South, the findings reveal that OER policies appears as positive accounts guiding the publish OER, but are unable to engage with practical implications of use and reuse. Such policies enlighten on good practice but are found wanting in encouraging lecturers to reuse educational materials created by others (Arinto, Hodgkinson-Williams & Trotter, 2017:584). This confirmation signify the demand for more critical discussions of OER policies (ibid, 2017:584).

### 3.9 Available OER platforms

Institutional policies should be structured in such a way that they can enable the organisation and control of the increase in OER platforms globally. Universities find it important to use OER in order to support their teaching and learning. Various universities in Vietnam, Cuba, United States, United Kingdom, Thailand, Spain, South Africa, Russia, Portugal, the Netherlands, Ireland, Iran, India, Hungary, Canada, Brazil and Australia are initiating OER projects (Bansal et al., 2013:7).

The idea behind institutional policies providing for the availability of OER platforms is to guide universities towards taking part in the development of OER platforms. The motive for the rapid increase of OER is that global knowledge as a public good needs to be accessible to everyone through technology and the World Wide Web (Ibid, 2013:7). Some of the notable OER platforms are highlighted below:

#### 3.9.1 OpenLearn platform

The OpenLearn Initiative was launched in 2006 and is modelled on the MIT Open Courseware. It is financed by a grant from the William and Flora Hewlett Foundation and individual donations which sustain its daily activities (West, et al., 2011:22). It is an initiative by the UK Open University. It involves different aspects of OER production including use, content provision, reuse, user-generated content, translations, and localisation. It can be used by everyone including students, teachers, professionals, parents, prisoners, vulnerable groups and higher education institutions (dos Santos, 2012:22). Sapire (2010:16) also adds that the

OpenLearn Initiative served as a foundation for research and collaborative development into the collaborations and reuse of OER.

The OpenLearn Initiative has its roots in being UK Open University's main hosting website for OER (McAndrew & Lane, 2010:1). It consists of LearningSpace and LabSpace that provide academics and students access to educational resources from Open University (OU) courses and teaching projects as study units in a Moodle-based learning environment (ibid, 2010:1).

### 3.9.2 OpenStax model

The founder of OpenStax is Dr Richard Baraniuk, a lecturer at Rice University, in the United States of America (OpenStax, 2017:1). This platform is meant to provide knowledge creators an opportunity to share and modify educational resources, including courses and books (Ibid). OpenStax provides high-quality, professionally edited, free textbooks to subjects enabling students to take introductory courses (Fraknoi, 2017:502).

OpenStax books are peer-reviewed, customisable, and licensed under a Creative Commons License 4.0 International (Watson, Domizi & Clouser, and 2017:289). Students can access the text from OpenStax in a number of ways. For example, they can view it online, download it to a local device, print it, or order a low-cost print version of the text (OpenStax, 2015:5). Consequently, it permits most of users' unrestricted access to thousands of workbook learning objects in different disciplines (OpenStax 2017:1).

### 3.9.3 Multimedia Educational Resources for Learning and Online Teaching (MERLOT)

The Multimedia Educational Resource for Learning and Online Teaching (MERLOT) is a California State University initiative developed in 1997. It is a programme aimed at improving the quality of teaching and learning by increasing peer reviewed, openly available learning objects for different disciplines that may be incorporated into faculty designed courses (Kutluca, 2010:235). This initiative is made up of different peer-reviewed, free open online teaching, learning and research materials targeted at members of the international community (MERLOT, 2017:n.p). Okewole and Knokh (2016:5) reveal that "the MERLOT consortium is a group of partners who contribute to the strategic development of the system and help to grow the community user base".

Cechinel and Sánchez-Alonso (2011:3) assert that MERLOT provides users to classify educational resources with the aim of encouraging the use and sharing of online teaching and learning resources. MERLOT was initiated when OERs were not yet used and it is among OER pioneers (Okewole, et al., 2016: np).

### 3.9.4 Open education consortium

The Open Education Consortium is an initiative by various universities with the intention to advance OpenCourseWare and its influence on global education. OCW is also a coordinator for global OCW movement, as a forum for exchanging ideas and as a supporting resource for starting and sustaining OCW projects (Vladoiu, 2011:277). Open Education Consortium (2017:n.p.) views Open Education Consortium as a global network of individuals, educational institutions and societal groups who are mainly based in the United States of America. It has its roots in the principles that advocate for collective development, sharing, innovation, openness, collaboration, and use of open educational resources (ibid, 2017:n.p.).

### 3.9.5 Open educational quality initiative (OPAL)

OPAL is a two year cross-European initiative (2010-2011). It has positioned itself to produce a framework of OER practices that can improve quality and innovation in education (Cronin, et al., 2018:129). The Open Educational Quality is an internationally funded organisation whose motive is commitment to innovation and advanced training in all spheres of education (Open Educational Quality Initiative, 2011:2). It was created to ensure that free, high quality, Open Educational Resources are made and distributed for free, using a platform that is accessible to all citizens of the world (Ibid). The conceptualisation of OEP was started by the OPAL report of 2011 with the Ehlers being a project team member and co-author developing a framework relating its constituting elements (Cronin, et al., 2018:129).

## 3.10 OER policy formulation

The formulation of policies guiding the use of OERs in teaching and learning at most universities is still at its infancy. McGreal (2010:1) indicates that the first OER to be developed generated collaboration and demanded ideas from both lecturers and discipline course specialists. In the view of different institutional policies around OER, it is clear that OERs are still yet to have their impact on educational institutions (OPAL REPORT, 2011:8). Most of the existing policies seem not to have been formulated to aid autonomous open educational practices and open learning (Kozinska, 2013: 255). This means that the existing institutional policies had to be changed in order to focus on the use of OER in teaching and learning. Since

the development of OERs resulted from the growth of the ICT network, there are elements that must be considered when formulating OER policies. These elements include awareness of OER and the necessary infrastructure for OER practice (Hodgkinson-Williams, Arinto, Cartmill and King, 2017:37). Most importantly, OER policy formulation should aspire to provide the much needed equality in the provision of quality education. Onaifo (2016:285) suggests that universities need to be inspired to develop policies that provide a framework for teaching and learning activities. However, there still are policy challenges that many universities grapple with today. Some of these challenges include policies and practices that fail to enhance the mainstreaming of OER and open learning in many universities (Kozinska, 2013: 59). However, Chikuni, Cox & Czerniewicz (2019:172) declare that although there seem to be policies informing good practice in creation, these policies are failing to inspire lecturers to reuse teaching and learning materials created by others. This failure signifies that student's opportunities for quality teaching and learning are limited. Such is an increased opportunity for personalised education.

Kozinska (2013:58) identified the cause of the slow use of OER as lack of harmony between resources, policies and practices. OER creation and use can be encouraged by means of policies that authorise or motivate its creation (Orr *et al.,* 2015:35). The existence of a national policy document serving as a design for universities requires that OER policies flourish at universities (Kelly, 2014:2). Effective OER will thrive in a bottom-up orientated environment supported by an effective top-down policy (Stacey, 2014:69). The government as one of the crucial stakeholders in the success of OER movement needs to engage current, accepted legal, practical, and policy tools to ensure the most structured and impactful use of the public education purse (Jhangiani, et al.,2017:37). The importance of policy in the development of better teaching practices in matters of OER creation and adaptation is high (Glennie, Harley and Butcher, 2012:6). The desire to create and use OER at most universities has been propelled by instrumental determination to defeat existing challenges of accessing educational materials in limited resource contexts (ibid, 2012:4). Van der Woert, et al., (2015:57) declare that universities guided by open policies have a better opportunity to win grants and funding from interested parties.

The active role played by the government will go a long way in fostering the much needed collaboration between OER stakeholders, both locally and internationally. Government involvement is crucial in that it will provide leadership to strengthen links with international universities offering similar courses, thereby easily enabling the affected university to collaborate in interrogating course development and promoting the use of OERs (International Council for Open and Distance Education, 2014:11). Governments should ensure that the

collaborative approach, which is more inclusive, is embraced in OER policy development in order to inspire increased OERs ownership and mass adoption **(**Abeywardena, Karunanayaka, Nkwenti & Tladi, and 2018:82).

Furthermore, there is an urgent need for government and university policy formulation to effect the relationship between wider participation and adoption of OER and promote OER initiatives (Bossu, et al., 2012:161). Lecturers, as the ones responsible for OER implementation at universities, would need to be gathered to encourage collaboration, development, revision and sharing of OERs (Orr et al., 2015:33). Glennie, et al., (2012:2) suggest that at university level, the lecturers' personal conviction needs to be translated into policy and practice. There is a lot of talk about the need for OER policies to address issues beyond funding, but to also investigate different ways of integrating OER in teaching and learning for long term sustainability (Yuan, Robertson, Campbell & Pegler, 2010:4). In the absence of a definite policy on the sharing of educational materials through open licences, marginalised communities will continue to acquire the content and resources that is already funded by taxpayers (Commonwealth of Learning, 2017:22).

Kanwar and Misra (2018:7) highlight the need for the development of OER in local languages in order for local communities to be part of lifelong learning by 2030. McGreal (2010:1) agrees that OER policy should obligate the development of basic literacy skills in two languages. The strengthening of local languages should be encouraged in OER policies in order to make the education sector even. Geser (2012:30) meanwhile, argues that the utmost use of OER will be achieved provided OER are accepted as part of educational policies aiming at enabling equal opportunities for everyone. Educational policies need to correct the shortcomings identified in the educational sector by providing clear guidance on OER use (Orr *et al.,* 2015:32).

### 3.10.1 Library Infrastructure, database and catalogue policies

In this era of new educational technologies, there is a growing need for librarians tasked with the training of library users to nurture an understanding of how these changes affect their use of library services (Morudu, 2019:8). New educational technologies have become an increasingly dominant factor in nearly all aspects of teaching and learning. The clear understanding of new educational technologies like OER and all its language is in demand for librarian leadership. Ngulube (2010:50) notes that researchers gravitate towards accessing academic material through the use of the Internet. It is increasingly becoming a common denominator that library staff of different institutions are knowledgeable about accessing and designing websites brought by new technologies. However, there seems to be some sort of

reluctance to acquire new skills required by these new technologies among some librarians. One example is the use of OER. Institutional policies and support guiding the library infrastructure, database and catalogue in this regard should put an effort to bring basic competence to library staff.

Library infrastructure, database and catalogue regulations in the use of OER are also becoming vital for the integration of OER in teaching and learning. Library infrastructure, database and catalogue are another type of support needed to facilitate the integration of OER in teaching and learning. When there is little or no legislative guidance on library infrastructure, database and catalogue for OERs, the latter cannot advance library staff training needs. The new development, whereby staffs of different libraries have to assume new roles as a result of new technologies, requires that they be provided necessary training and support to make them conversant with these new roles. The result of ambigous policy directives to librarians, in the context of new technologies like the OER, is lack of awareness about intellectual property rights and copyright issues and Open Access Institutional Repositories (OAIR). These issues are explained as follows:

### 3.10.2 Intellectual property rights

The use of OER is enabled through the open licence which allows free use and reuse by other users (Bissell, 2009:97). The policy formulation process should advocate for national OER policies that clearly guide universities on intellectual property rights regarding the academic work of lecturers. Prabhala (2010:1) refers to intellectual property as the creations of the mind. In response to the uncertainty around ownership of created knowledge, institutional policies on lecturers created knowledge should be clear. It should be apparent whether this knowledge belongs to the institution or the creator, and if (or how) such materials could be disseminated via open repositories (Onaifo, 2016:287). OER use is enabled through the open licence which allows free use and reuse by other users (Bissell, 2010:97). Openly licensed creative works are protected using unrestrictive licences that enable non-commercial or commercial reuse, and sometimes adaptation, without requesting the permission of the creator (Ncube, 2011:272). The first important characteristic is that OERs are accessible on the public domain under unrestricted licensing laws (Butcher, et al., 2015:8). OER are released under a CC licence which enables lecturers and universities to allow their creative work to be used by others for free (Karipi, 2020: xv). CC is a global philanthropic organisation which was established for the purpose of allowing for knowledge to be created, shared, and re-used with little or no legal contract attached (Creative Commons, 2001:1). CC undertakes to support the

formation of open policies that guide the creation of educational resources that are freely available and publicly funded (Van der Woert *et al*., 2015:58).

Institutional policies and support guiding library infrastructure, database and catalogue to regulate information access is crucial for the growth of many developing countries like South Africa. Intellectual property rights can be of great value to the whole world for many reasons: protection of author's ownership rights or assurance that society's creative minds are encouraged to keep on creating (Kouletakis, 2014:20).

Institutional policies should prescribe Intellectual Property (IP) laws which provide impartial protection for acceptable types of works in virtually all industries; to accomplish impartiality to authors, user and communal interests; and to advance the country's efforts to attain economic development (Ncube, 2013: 369). It is through the availability of institutional policies supporting and guiding intellectual property rights and copyright awareness that institutional libraries are able to safeguard intellectual property.

The current needs of libraries need to be consistent with the introduction of new educational technologies. OER are also addressed as the institutional policies embraces copyright legislation. The author's right to reuse, remix and adapt the work from hard format to electronic format need to also be regulated by institutional intellectual property right and copyright policies (Kodua-Ntim, 2020:54). Publishers need to be guided by institutional policies on Open Access Institutional Repositories (OAIR) since OAIR is often misunderstood by publishers as a possible hindrance and threat to their business (ibid, 2020:54). OAIR inclusive institutional policies help institutional researchers and library staff avoid the contravention of publication laws. It is thus important that these institutional policies are clear in equating rights among key players in knowledge creation. This should then guide global librarian leadership in addressing information consumer needs.

### 3.10.3 Open access institutional repositories (OAIR)

Despite OAIR's promise to improve scholarly communication, this mode of knowledge sharing is not yet widespread in developing countries compared to developed countries (Abrizah et al 2017:54). Most authors are unfamiliar with Open Access (OA) and making their works available on OAIR is a serious problem. An even more serious problem is the lack of awareness of the existence of OAIR (Hulela 2010). Although there has been a steady increase in OAIR numbers, the adoption of this technology in universities remains slower than expected (Abrizah et al 2017; Hulela 2010).

The term Open Access Institutional Repositories (OAIR) refers to online archives of scholarly works produced at the local level for purposes of preserving and disseminating scholarly output (Giesecke, 2011:529). It provides clear, unambiguous guidelines under which repositories can operate and demonstrates long-term institutional commitment to ensuring sustainability (Ibinaiye, Esew, Atukwase, Carte and Lamptey, 2015:7). Bailey (2010:2) is of the view that Open Access (OA) applies to freely available publications on the net, permitting all users to read, download, copy, distribute, print, search or link to the full text of those articles, to safeguard that they are catalogued, transferred as data to software or used for any other legal purpose, without financial, legal or technical obstacles other than those that are inseparable.

Policy formulation processes at universities should also focus on providing guidelines for the inclusion of OER materials in university repositories. Onaifo, (2016:286) suggests that universities might potentially ensure the maintenance of local repositories for assembling open resources as part of their policy (Onaifo, 2016:286). According to (Kwame, 2020:58) there is a need for policies directing open access institutional repositories (OAIR) work in Africa. Some existing policies lack mandatory provisions for content depositing in OAIR, making the storing of materials optional (ibid, 2020:57). It is crucial for universities to engage in policy formulation processes that enable proper infrastructure which include repositories to promote the use of OERs in order to motivate the use of OERs amongst lecturers (Raneri, et al., 2016:586).

It is necessary for institutional policies to support the requisite awareness on OAIR availability and use. Kakai (2018:211) attributes the lack of OAIR awareness among researchers and academics and the limited staff involved in repository activities to low levels of OAIR content and OA. Hulela (2010:67) observed that as a result of most authors not being familiar with OA, they are unable to make their work available on OAIR. This author adds that, to a greater extent this is due to their lack of awareness of the existence of OAIR. Lecturers and librarians at universities therefore need OAIR awareness interventions. It can thus be argued that the university population must be conversant with OA to improve institutional adoption of OAIR. Likewise, for more effective use of OA to submit their work on OAIR, it is equally important for researchers to become fully acquainted with OAIR. Institutional policies should encourage the institution’s stakeholders to be actively involved in OA through the continuous OAIR workshops.

### 3.11 Conclusion

The literature reviewed in this chapter indicates the magnitude OER work, which has progressed over the last two decades in many countries. The deduction from the reviewed

literature is that there is a massive spinoff to be harvested from the use of OER in teaching and learning. The embrace of OERs by universities promises to accelerate the sharing culture within the university education sector. The aim of using technological innovation to enhance collaborative knowledge creation can be realised through this accelerated sharing culture.

The Rogers theory model is selected as a suitable theoretical framework in addressing the research questions of the study. Rogers' theory model assisted the researcher to collect data on the use of OER at South African universities.

# CHAPTER 4: RESEARCH METHODOLOGY AND DESIGN

## 4.1 Introduction

The preceding chapter exposed the theoretical frame foregrounding OER and challenges faced by academics when reusing and adapting OER in their teaching practice. This chapter explains the research methodology and design utilised in order to gather and analyse data to fulfil the aim of the study, which is to explore how lecturers use OER in their teaching at South African universities.

Research methodology, for Wahyuni (2012:72) embraces a set of specific strategies, instruments and skills put together to collect and analyse data. As pointed out by McMillan and Schumacher (2010:16), research methodology is structured and useful, formulated to produce data on particular research problem.

In addition to the above, a presentation is made on the research design, research site, population and sampling procedures, data collection, analysis and interpretation and ethical clearance considerations adhered to in the study. The Data collection indicates and explains the collection methods and the instruments used to collect data from the research participants and respondents. The data analysis is also outlined.

## 4.2 Research paradigm

### 4.2.1 Defining and conceptualizing a research paradigm

Paradigms play a foundational role in educational research. The term paradigm is derived from Greek word "aetiology" which means pattern (Kivunja & Kuyini, 2017:26).

A paradigm is best described as the philosophical assumptions or the fundamental ideals that steers the researcher's actions and define the worldview of the researcher (Kaushik & Walsh 2019:1). For example, a paradigm is perceived as "as a philosophical lens and a way of conducting research which is agreed upon by a community of researchers" and sets standards to regulate researchers (Sefotho, 2015:25). In this regard, a paradigm refers to the theoretical lens enabling researchers to examine the methodological aspects of their research studies in order to establish the research method and data collection methods for their study (Kivunja and Kuyini, 2017: 26). It is also argued that "a paradigm plays the important role of directing research efforts and organising core ideas, theoretical framework and research methods" (Zungu, 2019:14). Each research paradigm has a different frame of reference on axiology, ontology, epistemology and the methodology and provides (Kaushik & Walsh 2019:1). Shannon-Baker (2015:321) posits that the important point is that paradigms can help formulate the researcher's approach to a research problem and provide recommendations on how to solve the research problem. A paradigm illuminates the way researchers perceive the world and make sense if it (Sefotho, 2015:25). Romm (2014:134) further suggests that the process of combining both paradigms and methods enable researchers to be more considerate on the ontological, epistemological, methodological and axiological assumptions. Below is a clarification of pragmatic paradigm as the paradigm chosen to guide this study.

### 4.2.2 Pragmatic paradigm

This study follows the pragmatic paradigm as it is properly suited for the purpose of this research, which is to investigate lecturers' use of OER for teacher education delivery effectiveness at South African universities. "Central to pragmatism is the practical nature of being, reality or phenomenon" (Sefotho, 2015:28). Shannon-baker (2016: 322) identifies four paradigmatic perspectives for mixed method research which are pragmatism, transformative emancipation, dialectics, and critical realism. The pragmatism paradigm to be used in the study will help underline communication and shared meaning-making towards the production of practical solutions to social challenges (ibid, 2016:322). Pragmatists normally accept that experience is the origin of all knowledge (Adeleye, 2017:3).

The three important interrogations enabling analysis of knowledge construction paradigms are ontology, epistemology and methodology (Gallifa, 2018:73). It is critical that researchers accept and comprehend the ontological and epistemological direction within the research paradigm as it is able to control the entire course of the researcher's project (Aliyu, Singhry & Adamu, 2015:n.p). For Sefotho (2015:32) paradigms provide guidance within specific philosophical schools of thought for ontology, epistemology and methodology.

#### 4.2.2.1 Pragmatism as ontology

Kivunja and Kuyini (2017:27) refer to ontology as a branch of philosophy dealing with the suppositions we make towards the acceptance that something is logical, or the essence of the social phenomenon being examined. Ontology refers to one's suppositions about the essence of reality (Kaushik & Walsh, 2019; Zungu, 2019) Maarouf (2019:6) views ontology as the most disregarded aspect of the pragmatic philosophy. Pragmatist ontology works jointly with pragmatist epistemology hence a huge amount of philosophical work will be needed to make this coherent (Pratt, 2016:511). The pragmatist paradigm holds on to researchers avoiding to interrogate the reality and theory of knowledge (Saffar, 2019:128). Pragmatism is still to have a clear ontological stance that explains how pragmatic researchers can change between two opposite ontological positions to achieve their research purpose (Maarouf, 2019:7). The pragmatist paradigm supports a non-singular reality ontology which can be described as ontology having no single reality; one which admits that all individuals have their own and distinctive expounding of reality (Kivunja, 2017:35)

#### 4.2.2.2 Pragmatism as epistemology

Epistemology refers to the assumptions people make about a kind of knowledge (Al-Saadi, 2014:2). It encompass a certain recognition of what that knowledge demands (ibid, 2014:2). Epistemology pays attention to the connection between the researcher and the ontology (Zungu 2019:39). Sefotho (2015:31) points out that epistemology as a theory of knowledge answers the question: 'How, and what, can we know?'. Kaushik & Walsh (2019:1) view epistemology as a belief about how we know the world, how we gain knowledge, the relationship between the knower and the known.

According to the pragmatist epistemology, the interdependence of experience, knowing and acting, permitted the arrangement of different data collection procedures (Kelly & Cordeiro, 2020:6). A crucial underpinning of the pragmatist epistemology is that knowledge is always established on experience (Kaushik & Walsh, 2019:4). Pragmatist epistemology emphasises the importance of epistemology and the essentiality of one's world views for their study (Shannon-Baker, 2016:325). In addition, Kaushik et al. (2019:4) argue that pragmatist epistemology does not view knowledge as reality but as establishment to better manage one's existence and to participate in the world. Pragmatist epistemology acknowledges that knowledge cannot be gained through research without addressing epistemology. Pragmatism attracts epistemic attention to the processes of knowing that impresses people (Huffman, 2018:26). Kivunja (2017:35) also posits that the pragmatic paradigm advocates a relational epistemology. This means it holds that what the researcher considers appropriate to the specific study determines the relationships in research.

#### 4.2.2.3 Pragmatism as a methodology

Methodology is a mutual understanding of best ways for being informed about the world and mutual understanding of the language of research (Kaushik & Walsh, 2019:1). It brings a solution to the issue of suitable methods for data collection. Research methodology helps to answer the "why, what, from where, when and how" question on the data collection and analysis (Sefotho, 2015:31). In addition, Chauke (2014:15) views research methodology as a process of going about discovering knowledge.

Research methodology in the social sciences employs either the quantitative or the qualitative approach. Sometimes, research may draw strengths of quantitative and qualitative data gathering approaches to construct a coherent interpretive framework in order to understanding the research problem (Sheppard, 2020:72). The intentional use of both quantitative and qualitative research approaches in a single study is called mixed method (Shannon-Baker, 2015:321). Brierley (2017:3) posits that mixed methods research involves the data collection and analysis of both quantitative and qualitative approaches, and combining the two sets of results to draw conclusions. The execution of qualitative research together with quantitative research, mixed methods research, is further justified in that it helps address some of the drawbacks

of quantitative research (ibid, 2017:6). In addition, (Romm and Ngulube, 2015: 7) confirm that mixed methods research helps to accomplish a thorough and precise picture of reality.

### 4.2.3 Motivation for choosing Pragmatist paradigm.

This study was guided by the pragmatist paradigm. Kaushik & Walsh (2019:12) opine that a pragmatic approach enables the selection of relevant research methods from the broad range of qualitative and/or quantitative methods (Kaushik & Walsh, 2019:12). They also assert that the combination of this two research methods is a strength of pragmatism and offers advantages for social justice research (ibid, 2019:12). Pragmatism is not a philosophical position but a set of philosophical instruments to solve a research problem (Biesta: 2010:03) and hence pragmatism may be seen as being both inductive and deductive in each approach as illustrated in the following Table 4.1:

*Table 4 1: Principles of pragmatism paradigm.*

| | **pragmatism** |
|---|---|
| **Ontology** | Symbolic realism |
| **Empirical focus** | Actions and changes |
| **Type of knowledge** | Constructive knowledge |
| **Type of investigation** | Inquiry |
| **Role of researcher** | Engaged in change |

The pragmatic paradigm believes that experience is the origin of all knowledge (Adeleye, 2017:3). According to this study, knowledge comes from lecturers' experiences of using OER in their teaching and learning. Additionally, it underlines that human actions can at no time be separated from the past experiences and from

the beliefs that arose from those experiences (Kaushik & Walsh, 2019:3). The lecturer experiences examined in this study are limited to those of lecturers in public universities in South Africa and only to the lecturers involved in teaching and learning.

Pragmatic epistemological assumptions are of significance to the interrelation of experience, knowing and acting (Kelly & Cordeiro, 2020:6). Lecturers have different experiences on the use of OER in teaching and learning; researchers also have a particular perception on the use of OER in teaching and learning. The pragmatist researcher views people's ideas and beliefs as instruments for finding a solution to a problem and involving research participants as active participants of the existing world (Kelly & Cordeiro, 2020:3). The pragmatist researcher endeavours to solve practical problems in a context in which people do their daily activities (Sefotho, 2015:28). The researcher in the pragmatist paradigm becomes part and parcel of the real world in understanding the people's perception of the subject.

The pragmatic paradigm approach in this PhD study favours a mixed methods methodology, a combination of quantitative and qualitative research methods (Kivunja, 2017:35). Romm and Ngulube (2015: 7) contend that mixed methods research assists the researcher to achieve an extensive and precise picture of reality. Mixed-methods researchers choose pragmatism as a favoured paradigm by proposing that it has an unbroken connection to the needs of mixed-methods research (Kaushik & Walsh, 2019:7). Consequently, the pragmatist paradigm is suitable for this study because the examination of lecturers' use of OER in teaching and learning at South African universities is not limited to either qualitative or quantitative procedures.

The philosophical principles of the pragmatic approach assisted this study to explore and analyse lecturers' use of OER within the South African university teaching and learning context. The choice of the pragmatic approach lies in its value of using lecturers' actions in their teaching and learning practice to produce useful and actionable knowledge on the use of OER in teaching and learning (Kelly & Cordeiro, 2020:3). Secondly, a pragmatic approach provides an opportunity for researchers to investigate the correlation of lecturer's experience, knowing and acting in the use of OER in teaching and learning (ibid, 2020:4). Finally, this approach was adopted for its strength to connect beliefs and actions on the use of OER in teaching and learning through the experiential process (ibid, 2020:4).

The pragmatic propositions established by Kelly & Cordeiro (2020:3) were evaluated and explored to demonstrate their applicability in understanding the lecturer's use of OER within the South African universities teaching and learning context. Such propositions assist researcher's philosophies fashion their understanding of the lecturer's use of OER in teaching and learning as the pragmatic principle on human empowerment.

It is anticipated in this study that the pragmatic paradigm is eventually used in the development of an effective educational enterprise, such as an OER distribution framework, based on scholarly publications and the findings of this study. Essentially, the pragmatic paradigm serves as an analytical framework (Hathcoat & Meixner, 2017:437). It provides researchers with an analytical framework through which they can move beyond the paradigmatic maxim (ibid, 2017:437). Moreover, it also serves as a theoretical perspective (Morgan, 2020:66). It provides guidance to the philosophical and theoretical grounding for lecturers' use of OER in teaching and learning (Morgan, 2020; Kelly & Cordeiro, 2020). Additionally, the pragmatic paradigm provides researchers with a method of planning and practice (Forester, 2013:5). Finally, it enables researchers to manage complicated, vigorous organisational processes where action can have diverse temporal qualities (Kelly & Cordeiro, 2020:1). The pragmatic paradigm provides researchers with management processes to evaluate and examine the lecturer's use of OER in teaching and learning.

To sum up this section, the aim of this study is to to explore how lecturers use OER in their teaching and learning at teacher education faculties in South African universities. The purpose is that, through extensive published scholarly works and empirical findings from this study, a framework be developed to guide lecturers' use of OER by teacher educators at South African universities. In order to gain an in-depth understanding of how lecturers use OER in their teaching at South African universities, an exploratory mixed-methods methodology using qualitative and quantitative approaches (pragmatic approach) were used for this study. Ling (2017:30) posits that the 'research is driven by the agenda and practical needs of the researcher and/or those employing the researcher's skills.' The qualitative paradigm is based on subjectivism and interpretivism while the quantitative paradigm is founded on objectivism and positivism (Maarouf, 2019:3). Several researchers refer to the

combination of the qualitative and quantitative paradigms (mixed research) as a third paradigm (ibid, 2019:3). A rationale for using the mixed methods is to enable the researcher to use a more integrated approach with the potential to yield better research outcomes by tapping on the strengths of each research paradigm as indicated earlier. The study used semi-structured face-to-face (qualitative) and structured online survey (quantitative research method) to collect data. The collected data was subjected to both quantitative and qualitative analysis in order to counter the challenges of generalizability and transferability.

### 4.3 Research design

Creswell (2014:31) states that research designs are the plans and procedures which the researcher brings to the research study. To Macmillan et al. (2010:20), it is the method of conducting the study which will include the timing and the conditions under which the data will be gathered. The research design involves the whole research process. This is further corroborated by Van Wyk and Taole (2015:165) who see the research design as a plan on how research is going to be conducted. In addition, Kibinkiri (2014:123) also point out that the research design is a formula, structure or layout used to obtain data associated to a given problem. Both researchers agree that it is a plan that guides the researcher to guard against misinterpretation of results.

Punch (2011:62) in his definition this term as a way of guiding researchers, indicated that a research design is a plan for research that comprises of four main thoughts of the strategy, the conceptual framework, the question of what will be studied and the tools and procedures and analyses of empirical material.

Based on the definition by Punch (2011: 62), it will be advisable to also indicate the functions of a research design. In the view of Van Wyk, et al., (2015:165) the following are the two important aspects detailing the function of a research design:

- The identification and development of specific processes and procedures of the research plan of action to conduct a research study
- The specific design that informs the procedures to ensure that the design is valid, accurate, and sets out objectives to be achieved

In addition, Macmillan et al. (2014:114), indicate that the goal of a research design is to ensure that the research results are credible. The selection of a research design in the study is guided

by the nature of the research problem, the researchers' personal experiences, and the beneficiaries from the study.

### 4.3.1 Reason for a research design

MacMillan, et al. (2010:20), recount the plan for managing research studies. These include questions like from whom and under what conditions the data will be obtained. According to de Vos et al (2011:07), the research design should pay more attention to the end product and all the steps in the research process in order to arrive at the anticipated outcome. Ndike (2014:08) also asserts that the research design is a plan and procedure for research. They choose to describe the term 'research design' as "a step in the research process''. The researcher therefore chooses to use the exploratory sequential mixed methods approach thus combining the elements of both qualitative and quantitative methods in studying the research problem. The application of the mixed methods approach enabled the researcher to use different instruments of data collection, sampling and data analysis in a single study.

According to Creswell (2014:43) the mixed methods research is a research design which holds that all methods are prejudiced and feeble, and that the data collection of both qualitative and quantitative approach have the ability to neutralise the weaknesses of each form of data. The exploratory sequential mixed methods as a methodology involves theoretical premises that guide the qualitative data is analysed to make a follow-up with the quantitative phase of the study. At the core of the assumptions is the thinking that the combined use of qualitative and quantitative approaches produces a better interpretation of the research. In the view of Creswell (2014:45), mixed methods enable the researcher to make deductions covering both the qualitative and quantitative approaches.

### 4.3.2 Rationale (Motive) for employing an exploratory mixed methods design for this study

According to de Vos et al (2011:26), researchers who first need to explore the research problem using the qualitative data before measuring the data quantitatively will be employing an exploratory sequential mixed methods design. For Gibson (2015:02) the four major features that confer robustness on the mixed methods design are: enhanced range for collaboration, generalization, triangulation and interpretation. This study will follow an exploratory mixed methods approach**.** The data collection process will follow an exploratory mixed method as defined by Creswell, Klassen, Plano and Clegg (2011:08). Their explanation holds that it begins by a qualitative exploration followed by a quantitative follow up or by a quantitative analysis explained through a qualitative follow up. Equally, according to de Vos et al.

(2011:441), the exploratory mixed method is employed when the researcher first needs to explore a phenomenon using qualitative data before attempting to measure it quantitatively. Creswell (2014:226) notes that this method helps researchers gain insight into the research problem by developing measurements from specific samples of the population and using the data from the few participants of the population to generalise to a large sample of the population. Furthermore, he points out that the researcher initially begins by exploring the research problem with qualitative data and analysis and then utilises the findings in the quantitative phase. Thus, the exploratory mixed method is not a method for collecting data only, but rather a research skill wherein different types of research methods such as interviews and surveys can be used. The study will specifically follow an exploratory mixed method design which will enable the researcher to explore the application of findings from a smaller sample unto a larger sample of the study population.

MacMillan et al. (2014:33) posit that the purpose of exploratory designs is to initially subject a few participants to the qualitative phase of the study to identify themes, ideas, perspectives and beliefs that can be used to create a large scale tool for the quantitative phase. The goal is to acquire different data on the same research problem. In this study, the qualitative phase employs the semi-structured face-to-face interviews with academics at South African universities. It is then followed by the quantitative phase of the study which includes an online survey addressed to teacher educators at South African universities. The qualitative (semi structured interviews) and quantitative instrument (online survey) will be used to triangulate the findings that will emerge from the study. The semi structured interviews will be used to collect data from teacher educators in the qualitative phase of the research study while the quantitative phase will employ an online survey, and will be administered to teacher educators who are re-using and adapting OER in their teaching. This methodology involves philosophical assumptions that guide the collection and analysis of data and uses the mixture of qualitative and quantitative approaches. The main rationale behind the combined use of the qualitative and quantitative approaches in this thesis stems from my desire to understand better how teacher educators re-use and adapt OER in their teaching at South African universities. Given the complexities of the issues of re-use and adaptation of OER in teaching, neither qualitative nor quantitative method capabilities could exclusively apply. This is because none of the two working alone could provide the flexibility to examine the issues rigorously. As Villiers and Fouche (2015:137) further argue, the mixed method approach involves using qualitative research methods of data gathering like interviews to inform the use of other quantitative methods.

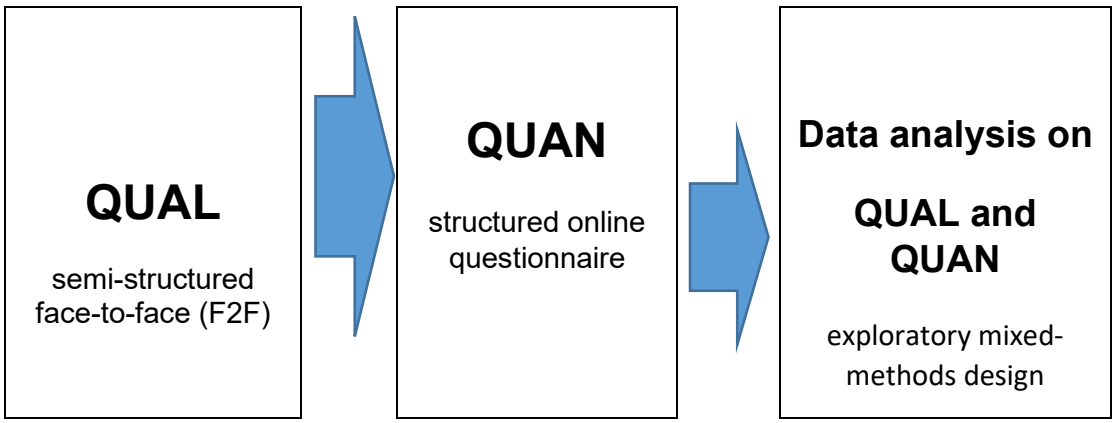


*Figure 4. 1: Exploratory mixed methods design*

The above (figure 4.1) indicates that the semi-structured face-to-face (F2F) (qualitative design was used to collect data from the nine academics from four South African universities to identify themes, ideas, perspectives and beliefs that can be used to create a large scale tool for the quantitative phase. Thereafter the structured questionnaire (quantitative design) was used online to collect data from a large group of respondents from the same four South African universities in order to gain in-depth data for this study.

### 4.4 Qualitative data

The first phase of the exploratory design mixed method deals with the qualitative methodology, where semi-structured face-to-face (F2F) were used to gather data from participants. The data was then analysed in order to gain understanding of how teacher educators re-use and adapt OER in their teaching at South African universities. This enabled the researcher to identify themes, ideas, perspectives and beliefs that were then used to create a large scale tool for the quantitative phase. Semi structured interviews, are seen by de Vos et al. (2011:352) as relevant when a researcher is specifically interested in a complex situation or a process whereby there are controversial and personal issues.

To these authors (2011:352) the most common use of semi structured face-to-face interviews are when a researcher is specifically interested in a complex situation or a process involving controversial and personal issues. The researcher uses the research interviews to expose personal research problems in order to bring solutions.

To Kallio, Pietila, Johnson and Kanyasniemi (2016:2955), structured face-to-face interviews are the popular as they have shown to be flexible and adaptable. Participants have the liberty to freely air their views while the researcher has the duty to keep the focus of the interview.

### 4.4.1 Semi-structured face-to-face (F2F) interviews

De Vos et al (2011:352) describe semi-structured face-to-face interviews as a way for the researcher to follow up on the interesting avenues emerging from the interview whereby the research participants are able to provide the researcher with the full picture of that avenue. The researcher used semi-structured face-to-face (F2F) interviews with an interview schedule in order to have a perception of the central themes of the research participant's experiences (*cf.* Appendix F). Semi-structured face-to-face (F2F) interviews were conducted with nine academics who have experience of teaching, and using OER in their teaching. Each participant was made conversant with the interview questions before the interview, to allow time for reflection. The semi-structured face-to-face (F2F) interviews were conducted at the university during the academic's non- contact time in the Head of Department office. Each interview was tape-recorded, with the permission of the interviewees, and transcribed afterward verbatim. The interview placed much emphasis on academics to gather a clear perspective from the point of view regarding their re-use and adaptation of OER in their teaching. Each interview lasted 30 minutes. Data was analysed through coding and categorisation in order to expose commonalities, patterns and difference across the data collected.

### 4.4.2 Recruitment of participants

The first sample for the qualitative phase of this study was drawn from faculties of education / colleges of education/ schools of education of TUT, UMP and UNISA, which are currently re-using and adapting OER in their teaching. The nine academics drawn as participants had experience of teaching, and using OER in their teaching. Purposeful sampling was the process used in selecting the participants for a qualitative project by recruiting participants who were able to inform the central phenomenon in the study, like OERs**.** Further, participants were engaged in an interview process which involved follow-up interviews by means of which the researcher was able to gain access to a particular perspective on the phenomenon under investigation.

### 4.4.3 Population and sampling

Babbie (2010:116) states that the population for a research study is composed of a group (usually of people) about whom the researcher draws conclusions. Similarly, de Vos et al (2011:393), view the population as a term intended to set boundaries on the study units.

The three universities, namely: UMP, TUT and UNISA, employ a large group of people in their faculties. These people are responsible for various academic duties within each of the three

institutions. Purposeful sampling was employed to select study participants in order to acquire in-depth information. This study targeted full-time faculty members, positioned in the teaching and learning functional units such as lecturers of the three universities.

This first phase of the research study was confined to the responses of lecturers at the TUT, UMP and the UNISA who currently use OER in their teaching. The nine lecturers drawn as participants were expected to have experience of teaching, and using OER in their teaching. Purposeful sampling assisted the researcher to select participants for a qualitative project whereby participants were to assist in informing the central phenomenon in the study, like OER, were recruited**.** Further, participants were engaged in an interview process that involved follow-up interviews (where necessary) through which the researcher gained access to a particular perspective on the phenomenon under investigation.

### 4.4.4 Interview process

The study used a semi-structured face-to-face (F2F) interview schedule and an audio recording device as research tools. The audio recording device was used to record the discussions with each of the nine lecturers. Field notes were also written in addition to the recordings done during the process. The semi-structured face-to-face (F2F) interview was fashioned to elicit as much data as possible on OER re-use and adaptation in the respondents' teaching, using four main questions with their sub-questions.

One semi-structured face-to-face (F2F) interview was done for per lecturer for the nine lecturers from three South African universities. The semi-structured face-to-face (F2F) interviews were held after contact hours as it was agreed with the participants. Each of the semi-structured face-to-face (F2F) interviews was held in the teacher educator's office. All the nine lecturers from the three universities participated. Semi-structured face-to-face (F2F) interviews for each participant were characterised by the researcher thanking the participants for availing themselves and explaining the purpose of the interview. The researcher was able to give participants an opportunity to contact the research team afterwards in order to reveal additional information they felt could be relevant.

After the researcher had asked the participants to read the consent form, he also made sure the participants were informed about the availability of audio recording. After the discussion, the researcher ensured the safety storage of the audio file. Care was also taken to keep respondent identities confidential. Participants were also reminded of their right to withdraw from participating at any time. The researcher began to ask interview questions once the consent forms were signed.

A summary of each participant's interview was written by the researcher within the same day of the interview. The summary included biographical information of the participant as well as the major themes that emerged from interviewing the participant. The resultant field notes as compiled by the researcher assisted in reporting and reflection on the re-use and adaptation of OER in teaching.

### 4.4.5 Analysis process

Thomas (2006:238) identifies the intent of the inductive approach as giving research findings permission to come out of the frequent, dominant, or significant themes inherent in raw data, without the limitations imposed by structured methodologies. This study employed an inductive thematic analysis approach to focus on the data collected using semi structured interviews with the chosen lecturers on the use of OER. This qualitative research methodology does not begin with a theory like the deductive approach. Inductive analysis is therefore a process of coding the data without trying to fit it into a pre-existing coding frame, or the researcher's analytic preconceptions (Braun and Clarke, 2006:12). The inductive approach is characterised by small sample size which often provides an extensive picture of the collected samples. An advantage of an inductive approach is that it is data driven (ibid, 2006:10). This data driven form of analysis helps the researchers to avoid assumptions and biases.

#### 4.4.5.1 Qualitative data analysis

The first phase of data analysis involved qualitative methodology, where semi-structured interviews were used to collect data from nine lecturers. The data was analysed to identify the emergent themes and sub-themes. MacMillan et al. (2014:395), view qualitative data analysis as an inductive process of arranging data into groups and recognising patterns and relationships among the groups.

The study employed the exploratory thematic analysis (*cf.* Figure 5.2*).* The Braun et al. (2006) thematic analysis, which provides a six-phase guide, was used in analysing the data collected during the face to face semi-structured interviews with the participants. Braun et al. (2006:6) view thematic analysis as a method of recognising, analysing, and describing themes within data. Nowell et al. (2017:2) contend that thematic analysis is a qualitative research method to possibly be used covering a range of methodologies and research questions. They explain that even though thematic analysis can produce trustworthy and perceptive findings there is yet no clear consensus about how researchers can rigorously apply the method.

As indicated, the Braun et al. (2006) thematic analysis framework provides a six-phase analysis guide, namely: familiarizing yourself with your data, generating initial codes,

searching for themes, reviewing themes, defining and naming themes and producing the report. This guide was followed in the study:

#### 4.4.5.1.1 Phase one: Familiarising yourself with your data

The researcher involved himself in a rigorous process of immersing himself in the data by carefully transcribing the interview sessions of each lecturer. The identification of patterns and meaning were completed by re-reading the transcript more than once. Braun et al. (2006:87) also concur that familiarizing oneself with one's data implies focusing on reading and re-reading the data and noting ideas. The NVivo 12 software data analyst was employed to do analysis. The analysis was conducted after transcripts were transmitted to the NVivo 12 software program in order to highlight the patterns, language and themes that were deducted from the interview transcripts. This is in line with the declaration that the aim of this phase is to become intimately familiar with your dataset's content, and to begin to notice things that might be relevant to your research question. You need to read through your entire dataset at least once – if not twice, or more – until you feel you know the data content intimately (Braun et al., 2012:6).

#### 4.4.5.1.2 Phase two: Generating initial codes

The creation of initial codes takes place during the second phase. In the generating initial codes phase, the researcher reduced the data to a manageable size in order to produce initial codes. This phase was focused on the initial production of codes from the data, a speculative activity that requires the researchers to continue relooking at the data (Nowell, et al., 2017:2). This phase categorised codes and produced an identity for any data feature relevant to the research questions. The second phase was completed when the data was fully coded and the data relevant to each code was assembled (Braun et al., 2012:7).

#### 4.4.5.1.3 Phase three: Searching for themes

Maguire and Delahunt (2017: 3356) explain a theme as a pattern that expresses something significant about the data and/or research question. Theme search characterises the third phase. The researcher in this phase coded nodes on NVivo 12 were read and reread in order to recognise larger patterns of meaning. In this phase, the researcher analysed and sorted the codes to identify themes (Braun, et al., 2006:19). This phased assisted to record what was important in the data that related to the research questions and indicated some type of pattern The same authors (ibid, 2012:8) posit that "another important element of this stage is starting to explore the relationship between themes, and to consider how themes worked together in telling an overall story about the data."

#### 4.4.5.1.4 Phase four: Reviewing themes

The fourth phase was characterised by the review of possible themes. The researcher in this phase focused on clarifying the draft themes from phase three using a two-level analysis of the codes. In the first level the researcher was involved in reviewing the codes for each theme to determining the existence of a coherent pattern (Braun, et al., 2006:20). Pattern identification meant the researcher moved to the second level of analysis by reading through the entire data set to ensure the themes fit in relation to the data (ibid, 2006:20) This phase involves a recursive process whereby the developing themes are reviewed in relation to the coded data and entire dataset (Braun et al., 2012:8).

#### 4.4.5.1.5 Phase five: Defining and naming themes

The goal of this phase was to be able to "…clearly define what … themes are and what they are not" (Braun et al., 2006:92). To meet this goal, the deep analytic work involved in thematic analysis was done which led to the crucial shaping up of analysis into its fine-grained detail (Braun et al. 2012:9). The supervisor and the researcher cross-checked the transcribed data and the computerised themes and sub-themes.

#### 4.4.5.1.6 Phase six: Producing the report

In the final phase, themes were described, labelled and fabricated in a report. This phase was what constitutes the thematic analysis (cf. 5.2.4.1; Figure 5.1 and Figure 5.2). The interpretation of data was guided by the research questions. This reporting phase "is an integral part of the analytic process" (Braun & Clarke (2016:14). It is characterised by the production of a report emanating from the analysis of selected interview extracts relating to the research questions. Braun et al. (2006:87) agree that in producing the report is "the final opportunity for analysis. Selection of vivid, completing extract examples, final analysis of selected extracts, relating back of the analysis to the research questions and literature, producing a scholarly report of the analysis are activities undertaken in this phase.

### 4.4.6 Trustworthiness

In evaluating the quality of qualitative data, the concept of credibility, transferability, dependability and conformability which are emphasised in this study comes to the fore. Wahyuni (2012:77) confirms by outlining four criteria for measuring the quality of qualitative research as: credibility, transferability, dependability and conformability. Qualitative researchers need to often ensure that there is precise recognition and recounting of research participants. Thematic analysis guided the researcher to conduct data analysis in precise and consistent manner through audio recordings in order to ensure trustworthiness. The use of

thematic analysis with the semi-structured interviews discussion assisted in establishing the trustworthiness of the study.

#### 4.4.6.1 Credibility

The research study is credible when the research findings clearly reflect the study's objectives which are accurate when measured. The goal of Credibility as pointed by Villiers et al. (2015:136) is to demonstrate that the study was conducted in such a way as to ascertain that the study subjects are accurately identified and defined. The research data need to accurately reflect the research participant's viewpoints. The challenge for the credibility of the study is for it to be accepted by the participants as accurate information.

In ensuring the credibility of the study, the researcher ensured frequent engagements with the Supervisor who is a professor in the Curriculum Studies in order to enhance the credibility of the study. The participants had sufficient engagements with the researcher in order to arrive at the rigorous approval of research findings. The Supervisor served as the debriefer with his extensive research experience. The researcher was on-site as a participant in the face to face interviews to ensure consistent data collection. The fact that the researcher is a former lecturer used to working closely with lecturers assisted in making participants comfortable. The credibility of the semi-structured interviews discussion data increased as the researcher implemented member checking. Member checking enables participants to play an active role by bring their own interpretations of the data. The participants were requested to review data and make changes where necessary. The completion of the semi-structured interviews discussion analysis involved a Senior Professor in the Faculty who was requested to validate trustworthiness.

Another key strategy to ensure credibility was triangulation. The researcher utilised all data collection techniques and a combination of viewpoints to expand the credibility of the study. Rahman (2012:156) posits that the process of triangulation increases the validity by incorporating several perspectives and methods. Romm and Ngulube (2015:23) concur with this notion when they suggest that the triangulation motive is allowed to restrain alternative research motives which include investigating multiple interpretations.

In this study, two different methods were used to obtain an in-depth understanding of how lecturers use OER in teaching and learning at South African universities. Lecturers involved in teacher education were subjected to a semi-structured interview. This was followed by the transcription of recorded interviews. A survey questionnaire and literature review were utilised as a means of triangulation. The study findings emanated from a single method.

Triangulation was also used in this study as a process to ensure the credibility of data. Triangulation involves employing various and many strategies and sources in order to increase the validity and fitness of research results (Guion, Diehl & McDonald, 2011). According to Hussein (2009) there are different strategies and methods of triangulating. These include data, theories, methods and analysis. Moreover, de Vos et al (2011:443) add that triangulation is a single-phase approach enabling the researcher to use both qualitative and quantitative methods concurrently and with equal weight to scrutinise the phenomenon of interest. Essentially, triangulation requires that numerous data collection techniques supplement each other in a single study. The researcher utilised all data collection techniques and a combination of viewpoints to expand the credibility of the study.

The researcher used theoretical triangulation which Hussein (2009: 3) defines as the application of multiple theories in the same study in order to sustain or reject study findings. The advantage of triangulation is that it limits the possibility of researcher bias and provides multiple ways and viewpoints from which analysis can be conducted.

Theoretical triangulation techniques employed in this study involved multiple methods of data collection and analysis which enabled validation of research findings. The two different methods were used to obtain an in-depth understanding of how lecturers use OER in teaching and learning at South African universities.

#### 4.4.6.2 Dependability

Research findings need to be relevant to the real life situation in that critical readers need to be persuaded to align with those findings. Research data will need to have a rich description in order to enable measurement of its dependability. The research findings need to be the same in different conditions to ensure dependability.

The study employed the intra-judge reliability wherein to view if there is consistency in terms of the obtained measurement from different evaluators of the research findings. The comparison of various semi-structured interview data that was recorded and collected over a period of not less than four weeks ensured this aspect.

#### 4.4.6.3 Conformability

Conformability is the degree to which the researcher indicated that the collected data reflects the participants' viewpoints. To obtain conformability, the researcher ensured that his biases and viewpoints did not in any way influence the research findings. 'The researcher thus needs to deliver evidence that corroborates the findings and interpretations by means of auditing'

(Villiers et al., 2015:136). Conformability refers to the establishment of whether the experiences and thoughts of the research study accurately represent only those expressed by the research participants.

#### 4.4.6.4 Transferability

Wahyuni (2012:77) sees it as the degree to which research findings can be relevant to other situations. The researcher alone cannot be the one to determine whether research findings can be transferred or not. Care was taken to ensure that the research data collected was accompanied by sufficient evidence comparable to the participants' quotations.

The study mentioned the number of universities that participated in the research process, the actual number of lecturers, data collection methods and the length of time over which data was collected in order to enable the transferability of findings of the study.

This study was focused on the use of OER at universities and the effect of OER on teaching and learning. The research findings can be useful for other research contexts and the study is expected to assist transformation in teaching and learning.


*Figure 4.0.1: The exploratory design used in the study*

### 4.5 Quantitative phase

The second phase of the mixed method exploratory design deals with the quantitative methodology. In this phase, an e-mail survey, as a type of online survey, was used to gather and examine participants' data regarding the lecturer's use of OER in teaching at South African universities. This data was obtained in order to formulate research findings. MacMillan et al. (2014:258) posit that the prime benefits of online surveys are reduced cost and time, quick response and easy follow-up as well as easy access to large population.

#### 4.5.1 Site Selection

Currently there are twenty-six (26) public universities in South Africa of which twenty-four (24) have colleges/school/faculty of education. It was not feasible to conduct the study in all the universities as far as time, money and energy were considered. The researcher chose to use the simple random sampling technique to select three universities having colleges/school/faculty of education namely TUT, UMP and the UNISA. The researcher chose to use purposeful sampling, as noted by MacMillan et al. (2014:152), to identify and select specific representative elements from the population that were or those that could be good informants about the topic. Taking into consideration the time and energy at hand; TUT, UMP and the UNISA are the three universities that were selected through the simple random sampling in order to gather data for this study.

#### 4.5.2 Population and sampling

MacMillan et al. (2014:258) defines a study population as the whole group of people or a set of objects and an eventuality that conform to a certain criteria that the researcher uses to draw deductions about. In addition, de Vos et al. (2011:224) posit that a sample is studied "in an effort to understand the population from which it was drawn".

Babbie (2010:188) view sampling "as a process of selecting observations". It is a process of selecting research participants for the study. To MacMillan et al., (2014:143) a sample is a group of subjects from which research data is collected.

The population of the study comprised of a number of lecturers selected from the three participating South African universities. The survey questionnaire data was collected from faculty members who included lecturers, Senior lecturers, Associate professors and Professors. This sample was selected based on the researcher's experience of being a university faculty member.

### 4.5.3 Sample size and sampling techniques

Singh and Masuku (2014:6) view the sample size as an important part of any study with the aim of making deductions about the population from a sample. The second sample for the quantitative phase of this study was drawn from the three selected South African universities.

The simple random sampling technique was used for the participants in this study. This sampling technique was selected to ensure equal representation of the variables in the study. The selection of faculty members within each university was by simple random sampling. The researcher wrote out the names of the faculty members on a piece of paper which was then folded and put in a box. The researcher selected an element, recorded it and put it back into the box until the required number was obtained.

The simple random sampling technique was used to select two hundred (n=200) lecturers from the three selected South African universities. The simple random sampling technique was based on the fact that teaching and learning activities are the responsibility of most lecturing staff at the universities. The questionnaire was emailed to three selected universities for completion. Two hundred (n=200) lecturers from the three selected universities were targeted to answer the closed structured questionnaire.

### 4.5.4 On-line surveys

According to de Vos et al. (2011:189), e-mail surveys involve the researcher sending an e-mail with an attached questionnaire such as Appendix X. The researcher used e-mail surveys containing a closed-structured questionnaire in order to further saturate the findings of the semi-structured face-to-face (F2F) interviews. The study focused on lecturers' use of OER in their teaching at four participating universities. The questionnaire was emailed to the one hundred and twenty (n= 200) lecturers at the three universities. The response rate of the on-line questionnaire was60.5%. , only N=121 responses were received, out of the N=200 sent questionnaires.

### 4.5.5. Design of the closed structured questionnaire e-mail surveys

The closed structured questionnaire was the instrument used for the e-mail survey (quantitative phase) of this study to augment the semi-structured face-to-face (F2F) Interview findings of qualitative phase of the study. The questionnaire was made up of five sections with closed-ended questions which made use of various 5-Likert scales. The design of the questionnaire is summarised in the table that follows.

*Table 4 2: Design of the Close Structured Questionnaire*

| Section | Item | Number of Questions | Total |
|---|---|---|---|
| A | Biographic data | 10 | 10 |
| B | Policies on re-use and adaptation of OER | 06 | 14 |
| C | Conceptualisation of OER | 08 | 08 |
| D | Challenges in re-use and adaptation of OER | 04 | 04 |
| E | Views on the models of OER re-use and adaptation and OER in general | 03 | 03 |
| | TOTAL | 31 | 31 |

The closed structured questionnaire employed closed-ended questions as studies shows that such questions are usually utilised in quantitative studies. Closed-ended questions provided the research participants liberty to select answers from a number of options. Research participants were able to save their time in being subjected to the closed-ended questions. As indicated by Acharya (2010:02), most of the data gathering operations in the quantitative research employ the use of structured questionnaires. Structured questionnaires were easy to use and administer. The closed structured questionnaire was functional in that it was able to cause frequencies of response relevant to statistical treatment and analysis (Cohen, Manion & Morrison, 2011:321).

#### 4.5.5.1 The close structured questionnaire

A questionnaire is a functional research tool designed to gather research data through a face to face interview and an on-line survey (*cf*. Appendix H). Cohen et al. (2011:377) posit that "the process of operationalising a questionnaire is to take a general purpose or set of purposes and turn these into concrete, researchable fields about which actual data can be gathered". The researcher in the quantitative phase of the study didn't interact with the research assistants or the research participants personally, the use of the closed structured questionnaire became relevant as they have an ability to be administered on-line without the presence of the researcher (cf. Appendix H). The call by de Vos et al. (2011:190), for the researcher to have clarity on the specific information to be gathered prior to the decision on the type of questionnaire to be employed in the study was closely heeded.

The rationale for employing a structured questionnaire in the qualitative phase of the study is in line with de Vos et al. (2011:186) who see an advantage in structured questionnaires. To them, this questionnaire allows the researcher enough control over the response rate. Acharya (2010:03) also concurs that the structured questionnaire has fewer discrepancies, is easy to administer, enables consistency in answers and return easily manageable data. The current study sought to collect objective data, facts and opinions with regard to the re-use and adaptation of OER in teaching at South African universities. To produce a valid questionnaire for the study, the researcher submitted the questionnaire to senior UNISA academics for rigorous testing and validation.

The structured questionnaire is often easy to analyse as all research participants were subjected to the same questions and it is therefore a suitable tool for the study. Everyone in the sampled population was made to respond to the same questions thereby enabling reliability.

### 4.5.6 Quantitative data collection

The quantitative phase of the study started after the researcher had obtained clearance from the UMP, TUT and UNISA (Appendix A to D). The researcher and the supervisor did rigorous scrutiny and held several discussions around the instruments which emanated from the semi-structured face-to-face (F2F) interviews.

The researcher obtained e-mail addresses of the academics of the three selected universities after being granted authorisation and used purposeful sampling in reaching the number of academics that have been purposefully selected during the sampling process. The purposeful sampling was necessary because most academics still rely on traditional methods in their teaching.

The 4-point Likert scale was the instrument chosen for the on-line survey (quantitative phase) and was used to collect data from the three South African universities. The on-line survey questionnaire is made up of five sections containing close-ended questions using a 4-point Likert scale.

#### 4.5.6.1 Quantitative data analysis

The second phase of the data analysis involved the quantitative data collected through the closed structured questionnaire. The online closed structured survey questionnaire was sourced online from lecturers after three weeks for analysis. The Statistical Package for Social Sciences (SPSS) version 9.2 statistical software package was used to edit, code and analyse

the quantitative data collected from the closed-ended questions. The analysis was carried out by an independent statistician. The results were presented descriptively in the form of frequency tables (cross-tabulations), histograms and pie charts and inferential statistics (factor analysis, t-test, ANOVA).

### 4.5.7 Response rate of questionnaires

The obtained sample size enabled the researcher to send two hundred questionnaires to the selected universities. The rate of responses received are indicated in the Table 4.3

*Table 4 3: Response rate per university*

| **Name of the University** | **Name of the province** | **Sent questionnaires** | **Completed questionnaires received** | **% Return rate** |
|---|---|---|---|---|
| University of Mpumalanga | Mpumalanga | **40** | 20 | 10 |
| University of South Africa | Gauteng | **100** | 57 | 28.5 |
| Tshwane University of Technology | Gauteng | **60** | 44 | 22 |
| **Total** | | **200** | **121** | 60.5 |

The University of South Africa had the highest return rate of 28.5%, while Tshwane University of Technology had second highest return of 22% in this study. The University of Mpumalanga had the lowest return rate of 10%. The usable rate of 60.5% of questionnaires completed by lecturers from all three universities is regarded as sufficient for the purpose of this study.

The survey questionnaires were automatically returned to the computed system when completed after three weeks for analysis (Appendix A). The quantitative data that emanated from the closed-ended questions were edited, coded and analysed using the Statistical Package for Social Sciences (SPSS). The results were then presented descriptively in the

form of frequency tables (cross-tabulations), and inferential statistics (factor analysis, t-test, ANOVA).

### 4.5.8 Validity and reliability

#### 4.5.8.1 Validity of the instruments used in the study

MacMillan et al. (2014:143) define validity as ‘’a judgement of the appropriateness of a measure for specific inferences or decisions that result from the scores generated.’’ Validity is concerned with the degree to which the research instrument achieves what it is intended to achieve, as research instrument purposes differ in scope, kind and number (de Vos et al, 2011:173). Mohajan (2017:14) commented that validity encloses the complete experimental concept and ascertains whether the achieved results meet social research requirements. Validity is thus seen as a dependable key to evaluation. Validity according to Olutwayo (2012:391) is contingent on the scale to which significant and suitable conclusions are made on the basis of results obtained from the research instrument used. The researcher has to ensure validity in all research phases beginning from data collection to data analysis and interpretation (Zohrabi, 2013:258). This is in line with Kazi and Khalid (2012:514) who assert that in order to make a questionnaire valid, it must undergo a validation procedure to make sure it accurately measures what it is intended to measure. To summarise, “validity refers to the extent to which a measurement adequately represents the underlying construct that it is supposed to measure” (Bhattacherjee, 2012:58).

The initial action taken by the researcher to ensure the validity of this study was to test the questionnaire by piloting it with a limited sample displaying similar features as those for the actual study. The crux of the pilot study was to enable the researcher to test the effectiveness of the survey questionnaire regarding its wording, length and clarification of instructions. The purpose of the pilot study is to improve the success and efficacy of the study (de Vos et al, 2011:241).

The researcher submitted the draft survey questionnaire to the study supervisor at UNISA for its sufficiency in measuring what it was supposed to measure to be evaluated and confirmed. This was intended to enhance the validity of the instrument. The researcher then went further ahead to pilot the questionnaire preceding the main research study to determine the effectiveness of the research instrument before it could be administered. In piloting the survey questionnaire, the researcher randomly selected ten lecturers outside the universities used in the study to respond to the survey questionnaire. Within a week, almost 90 per cent of the quota sample were able to respond which meant that the instrument was valid. The

researcher used the pilot study to discover the challenges with the questionnaire by using quota sampling.

The responses from the pilot questionnaires guided the researcher in reviewing the close ended questions. The responses indicated that the close-ended questions were easily misinterpreted by the respondents. Secondly, the researcher gained new insights into some close-ended questions which were unclear. This then allowed the researcher to refine the pilot survey questionnaire and peer review it with the study supervisor on numerous occasions. The survey questionnaire was refined accordingly in line with the objectives of the study and to ensure follow-up on the responses from face to face interviews.

Secondly, a content validity test was done to determine if the test items were focused on the use of OER in teaching and learning. The purpose for employing content validity in the survey questionnaire (Appendix A) for this study was to explore and identify the lecturers' use of OER in teaching and learning at South African universities. Construct validity ensured that the survey questionnaire was assessed by a statistician who reviewed all the questionnaire items. Furthermore, it ensured that the interview schedule -questions (Appendix B) fully represent the favourable items by involving experts in OER. Bolarinwa (2015:197) asserts that content validity refers to the degree to which the research instrument fully measures the construct of interest. Thus it enables researchers to measure the concept it initially intended to measure.

An independent t-test was carried out to ascertain the differences in trend on how male and female respondents responded to Section B to F of the survey questionnaire apart from the demographic data (Section A) in order to strengthen validity. ANOVA was also used to help gauge the significance of the responses given in questions 1 in comparison to Sections B to F of the survey questionnaire. The statistical significance level of testing (p-value) was set at $p = .000$ in all cases. The use of two different research instruments also enhanced the validity of the study. The two research instruments complimented each other in closing the gaps that could have been left if only one research instrument was used.

#### 4.5.8.2 Reliability of the Instrument used in the Study

Reliability refers to a matter of whether a particular technique will yield the same result each time when applied repeatedly to the same object (Babbie, 2010:150). Taking note of what has been outlined in the foregoing section, the researcher made certain that the tools used for data collection will yield self-same results each time they are applied on the same object.

In order to determine the reliability of the data collection instrument used in this study, Cronbach's alpha was employed. Sekaran (2000) cited in Nyengane (2007:74), stipulated the following table of reliability.

*Table 4 4: Cronbach's alpha for study variables adapted from Sekaran (2000) in Nyengane (2007:74).*

| Cronbach' alpha coefficients | Internal consistency levels |
|---|---|
| $\alpha \leq 0.9$ | Excellent |
| $0.9 > \alpha \geq 0.8$ | Good |
| $0.8 > \alpha \geq 0.7$ | Acceptable |
| $0.7 > \alpha \geq 0.6$ | Questionable |
| $0.6.5 > \alpha \geq 0.5$ | Poor |
| $0.5 > \alpha$ | Unacceptable |

All items had a coefficient greater than 0.8 which is adequate as stipulated by Sekaran (2000) in Nyengane (2007:74).

Most researchers require a reliability of at least 0.7 before they can use the instrument. In this study, the Statistical Package for the Social Sciences (SPSS Version 26) was used and computed the scientific acid test for the reliability of the measuring instrument. Once again, Cronbach's alpha test proved to be both appropriate, excellent and highly reliable as it provided a summary of inter-correlations that existed among the items on the use of OER by lecturers at teacher education faculties in South African Universities.

*Table 4 5: Scale Reliability Coefficients of the Data Collection Instruments*

| | Cronbach's Alpha | No of items |
|---|---|---|
| Conceptualisation of the use of OER and adaptation by lecturers | 0.959 | 8 |
| Policies on the use of OER and adaptation | 0.937 | 5 |
| Challenges faced by lecturers in the use of OER and adaptation | 0.942 | 4 |
| Views on the models on use of OER and adaptation and OER in general | 0.694 | 2 |
| Overall | 0.981 | 19 |

From the findings given in Table 1, the Cronbach's alpha value for each test definition varies from 0.694 to 0.981 and is thus all above the appropriate acceptable value of 0.7, while the average Cronbach's alpha value is $\alpha < 0.981$, which is excellent and highly reliable as an instrument (Wells & Wollack, 2003:5). In fact, the significance of the typical inter-item correlation is higher than the minimum reasonable value of correlation.

### 4.6 Adhering to specific ethical considerations to conduct this investigation

According to de Vos et al. (2011:114), research ethics are "a set of moral principles which are suggested by an individual or group, are subsequently widely accepted, and which offer rules and behavioural expectations about the most correct conduct towards experimental subjects and respondents, employees, sponsors, other researchers, assistants and students.'' This refers to the standards that guide the researchers' conduct in order to ensure that harm to the participants is prevented. Babbie (2010:64) also agrees that research participants need to have knowledge about general agreements on the proper and improper conduct shared by researchers. The following ethical considerations guided the researchers' conduct throughout of the study:

#### 4.6.1 Ethical clearance and acceptance

The research study involved humans therefore the researcher had an obligation to abide by the ethical principles in order to protect the rights and wellbeing of the participants in the study (McMillan, et al., 2010:117). The research study was driven by the need to sustain honesty and integrity as the integral part of the research. The application of ethical and legal clearance is crucial for the protection of the research participants. Before the conducting the research

study, the researcher made an application and was granted ethical clearance from UNISA CEDU (certificates, #2019/06/12/55362443/22/MC, *cf.* Appendix A; #2019_RPSC_043_AR, *cf*. Appendix B), from UMP (Certificate, Ref 29082019; *cf*. Appendix C) and from TUT (Certificate, Ref no: REC/2019/09/004;*cf*.Appendix D). The research participants signed a consent form to indicate their willingness to voluntarily participate in the study and to immediately withdraw their participation at any given time.

#### 4.6.1.1 Informed consent

Prior to the quantitative data collection phase, the researcher sent a letter of consent through e-mails to all the participants of TUT, UL, UMP and UNISA. The research participants were then informed about the goal of the study, their involvement duration, and procedures that were followed during the study and the pros and cons of the study. Informed consent ensured the protection and respect the right to self-determination of the research participants and ensured that they took responsibility for any event during the research process (Seherrie, 2017:89). The research participants of TUT, UMP and UNISA signed a consent form. The research committees of each of the universities viz TUT, UMP and UNISA granted the researcher permission to conduct the research at their respective university. The researcher obtained informed research participants prior to involving them in closed structured interviews.

#### 4.6.1.2 Confidentiality

The researcher ensured that participants were given assurance that their confidentiality and privacy was upheld throughout the research process. MacMillan et al., (2014:131) defines anonymity as when ‘’the researcher cannot identify the participants from the information that has been gathered.’’ Participants were informed that their names were withheld and anonymity assured. The anonymity of the research participants was easily maintained as the on-line survey had little information on the particulars of the participants. The researcher explained to research participants that the information gathered will be used for research purpose and will remain confidential. The researcher used pseudonyms instead of real names when reporting on the results of the on-line interviews.

#### 4.6.1.3 Protection from harm

MacMillan et al. (2014:131) advise that the research process should ensure that research participants are protected from physical and mental discomfort, injury or harm and from embarrassment by ensuring their confidentiality. The researcher ensured that participants were given assurance of them not being exposed to any harm or danger during the research process. The researcher did his utmost best to ensure that research participants were not in

any way physically and mentally harmed by the research process. The principle of respect for human dignity is the guiding principle to ensure that there are no subsequent concerns to be raised throughout the study (American Educational Research Association, 2011n.p). In order to assure participants of their safety from any harm, the researcher offered them letters of assurance before embarking on the research process.

### 4.7 Summary

This chapter outlined the research methodology followed to clarify the reasons behind the employment of the mixed method approach. The aim of the study was to explore the academic staff's sharing, use and reuse of OER in their teaching and learning at South African universities. The chapter outlined both the qualitative and the quantitative research approach as appropriate methods for conducting this research, since these acknowledge the use of different methods to collect data that promises to assist the researcher to construct a comprehensive knowledge about the sharing, use and reuse of OER in teaching and learning.

The non-probability sampling type of snowball sampling technique was employed in the study. The data collection methods in this study include face to face semi structured interviews and on-line surveys. The qualitative and quantitative data collection techniques and the data analysis methods were explained. Credibility, validity, transferability, conformability and dependability were employed to make the study trustworthy. The study observed ethical principles which were highlighted.

# CHAPTER 5: PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

## 5.1 Introduction

This chapter presents the results of the thematic analysis of twenty-four semi-structured interviews conducted with lecturers from UMP, UNISA and TUT. It as well as presents the analysis of the closed structured questionnaire. The main objective of the research was to to explore the lecturer's views on the use of open educational resources at teacher education faculties of selected South African Universities. The researcher managed to interview lecturers from each of the three universities following the same procedure and proceeded by administering them a closed structured questionnaire.

To achieve the overall aim of this study, information was gathered through a sequential–exploratory mixed-method approach based on the following research questions:

- What policies guide the use of OER as educational resources in the teacher education faculties in South African universities?
- How do lecturers at teacher education faculties conceptualise OER as educational resources in South African universities?
- What are the challenges faced by lecturers at teacher education faculties in the use of OER as educational resources in teaching and learning in South African universities?
- To what extent can scholarly publications and the findings of this study be used to develop and describe a proposed OER distribution framework that will guide lecturers' use of OER as educational resources in teaching and learning at teacher education faculties in South African universities?

## 5.2 Qualitative data analysis

### 5.2.1 Demographic information of the participants

#### 5.2.1.1 Characteristics of participants

This section presents a summary of selected personal characteristics of participants (lecturers) in Table 5.1. The following were the categories of participants who participated in this study from each of the study sites.

#### 5.2.1.2 Lecturers

The study subjected Twenty-four lecturers to face to face semi-structured interviews. The research participants were allocated codes Lecturer A to Lecturer W to distinguish them in the presentation of findings. Most of the lecturers except three (Lecturer G, Lecturer G and Lecturer G had more than five years of lecturing experience. It could be deducted that all the lecturers are familiar with the teaching and learning processes associated with higher education institutions. Consequently, their lecturing experience qualifies them to adapt their teaching and learning to new teaching and learning practices. It is also of utmost importance that all the lecturers who participated in the study have basic school level experience before being appointed as lecturers. Consequently, the deduction is that the participants were familiar with forms of pedagogy. Therefore, they should be able to differentiate between forms of pedagogies in order to have an insight into how they can apply different teaching styles to suit their students. The study pre-empted that lecturers were knowledgeable of their roles in engaging students in their university lecture halls and also knowledgeable about the factors that can convert teaching and learning into a rewarding journey. The following is the summary of the characteristics of the lecturers:

Table 5. 1: Summary of the Biographical Information of the participants

| Participant | University | Gender | Age | Highest Qualification | Experience | Department |
|---|---|---|---|---|---|---|
| Lecturer A | UMP | Male | 50 | PhD | Ten years in school teaching and seven years in university teaching. | Early Childhood Department |
| Lecturer B | UMP | Female | 59 | PhD | Twenty-three years in school teaching and nine years in university teaching. | Early Childhood Department |
| Lecturer C | UMP | Female | 52 | M.Ed. | Fifteen years in school teaching and seven years in university teaching. | Early Childhood Department |
| Lecturer D | UMP | Female | 61 | D.Ed. | Forty years in school teaching and 7 years in university teaching. | Early Childhood Department |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lecturer E | UMP | Male | 47 | M.Ed. | Nineteen years in school teaching and four years in university teaching. | Early Childhood Department |
| Lecturer F | UMP | Female | 40 | M.Ed. | Ten years in school teaching and five years in university teaching. | Early Childhood Department |
| Lecturer G | UNISA | Female | 44 | D.Ed. | Twenty years in school teaching and three years in university teaching. | Early Childhood Education |
| Lecturer H<br><br>Dr Olivier | UNISA | Female | 52 | PhD | One year in school teaching and fourteen years in university teaching | Early Childhood Department |
| Lecturer I | UNISA | Female | 57 | D.Ed. | Three years in school teaching and eighteen years in university teaching | Leadership and Management |
| Lecturer J | UNISA | Female | 62 | M.Ed. | Thirteen years in school teaching and twenty-eight years in university teaching | Early Childhood Education |
| Lecturer K | UNISA | Female | 60 | PhD | Twenty-seven years in school teaching and six years in university teaching | Leadership and Management |
| Lecturer L | UNISA | Male | 63 | D.Ed. | Seven years in school teaching and twenty-six years in university teaching | UNESCO Chair of ODL |
| Lecturer M | UNISA | Male | 55 | PhD | Twenty years in university teaching. | Leadership and Management |
| Lecturer N | UNISA | Male | 63 | PhD | Twenty-six years in school teaching and twenty-six years in university teaching | Educational foundations |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lecturer O | UNISA | Female | 46 | PhD | Twenty-one years in school teaching and four years in university teaching. | Curriculum and Instructional studies |
| Lecturer P | TUT | Female | 45 | D.Ed. | Seventeen years in university teaching. | Maths Science and Business Education |
| Lecturer Q | TUT | Male | 39 | PhD | Two years in school teaching and eleven years in university teaching. | Primary Education |
| Lecturer R | TUT | Male | 56 | PhD | Four years in school teaching and twenty-eight years in university teaching | Maths Science and Business Education |
| Lecturer S | TUT | Female | 56 | D.Ed. | Thirty-one years in school teaching and 7 years in university teaching. | Maths Science and Business Education |
| Lecturer T | TUT | Male | 49 | PhD | Ten years in school teaching and 7 years in university teaching. | Applied Languages |
| Lecturer U | TUT | Female | 49 | M.Ed. | Twelve years in school teaching and nine years in university teaching. | Primary Education |
| Lecturer V | TUT | Female | 56 | M.Ed. | Seven, years in school teaching and twenty-six years in university teaching | Primary Education |
| Lecturer W | TUT | Male | 63 | D.Ed. | Seven years in school teaching and twenty-five years in university teaching | Maths, Science and Business Education |

### 5.2.2 Emerging themes and sub-themes

Four themes were examined in the qualitative analysis of the data. The four themes (Conceptualisation, Teaching and Learning, challenges and institutional policy and support)

were subdivided into sub-themes. Table 5.2 summarizes the themes and sub-themes that emerged from the data collected.

*Table 5. 2: Emerging themes and subthemes*

| QUESTIONS | THEMES | SUBTHEMES |
|---|---|---|
| What are the existing models used by teacher educators for re-use and adaptation of OER in their teaching at South African universities? | Institutional Policy and Support | ➢ Available platforms<br>➢ Available support for staff<br>➢ Development and implementation<br>➢ Library Infrastructure ,database and catalogue |
| How OER is conceptualised by lecturers at teacher education faculties/colleges at selected South African universities? | Conceptualisation | ➢ Globalisation<br>➢ Access to educational materials |
| What is the status of specific policies guiding the use of OERs in the teacher education faculties/ colleges at selected South African universities? | Teaching and Learning | ➢ Artefacts<br>➢ Developing and enhancing course material<br>➢ Existing Models |
| To what extent can scholarly publications and the findings of this study be used to develop and describe a proposed OER distribution framework that will guide lecturers' use of OER as educational resources in teaching and learning at teacher education faculties in South African universities? | Challenges | ➢ Access to the internet and technological tools<br>➢ Education, Training and Awareness<br>➢ License and Copyrights |

### 5.2.3 Thematic map

The thematic map created in Figure 5.1 presents an overview of key factors that enable the use of OER in teaching and learning by lecturers and exposes how the overarching sub-themes "available support for staff" and "education, training and awareness", play a critical role in the use of OER in teaching and learning.

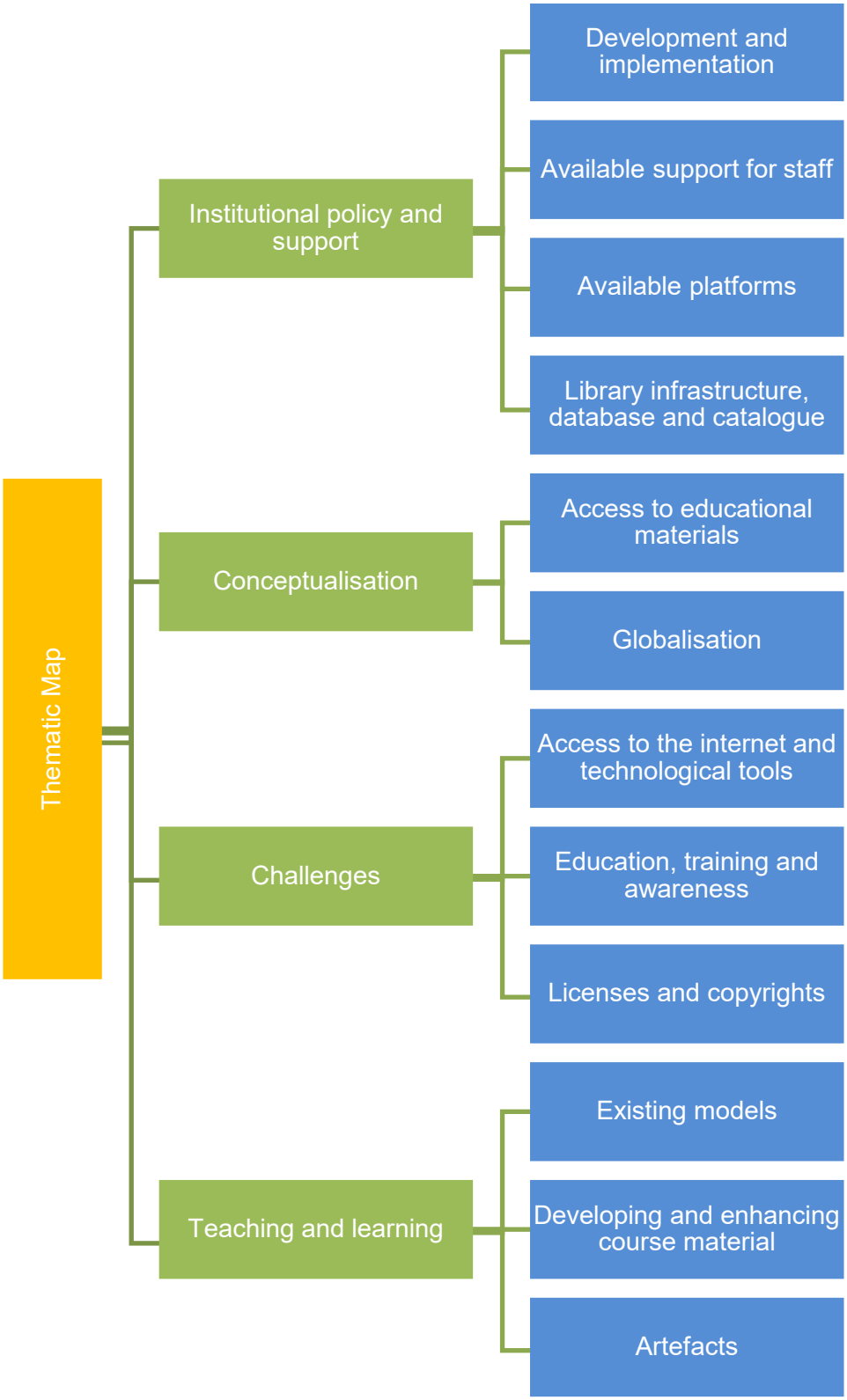


*Figure 5. 1: Thematic mapping of themes and subthemes*

### 5.2.4 The relationship between themes and sub-themes

The researcher created networks to show the relationships that emerged among the themes and sub-themes that were identified. The network relationship the researcher designed to summarize the participants' views are displayed in Figure 5.2.

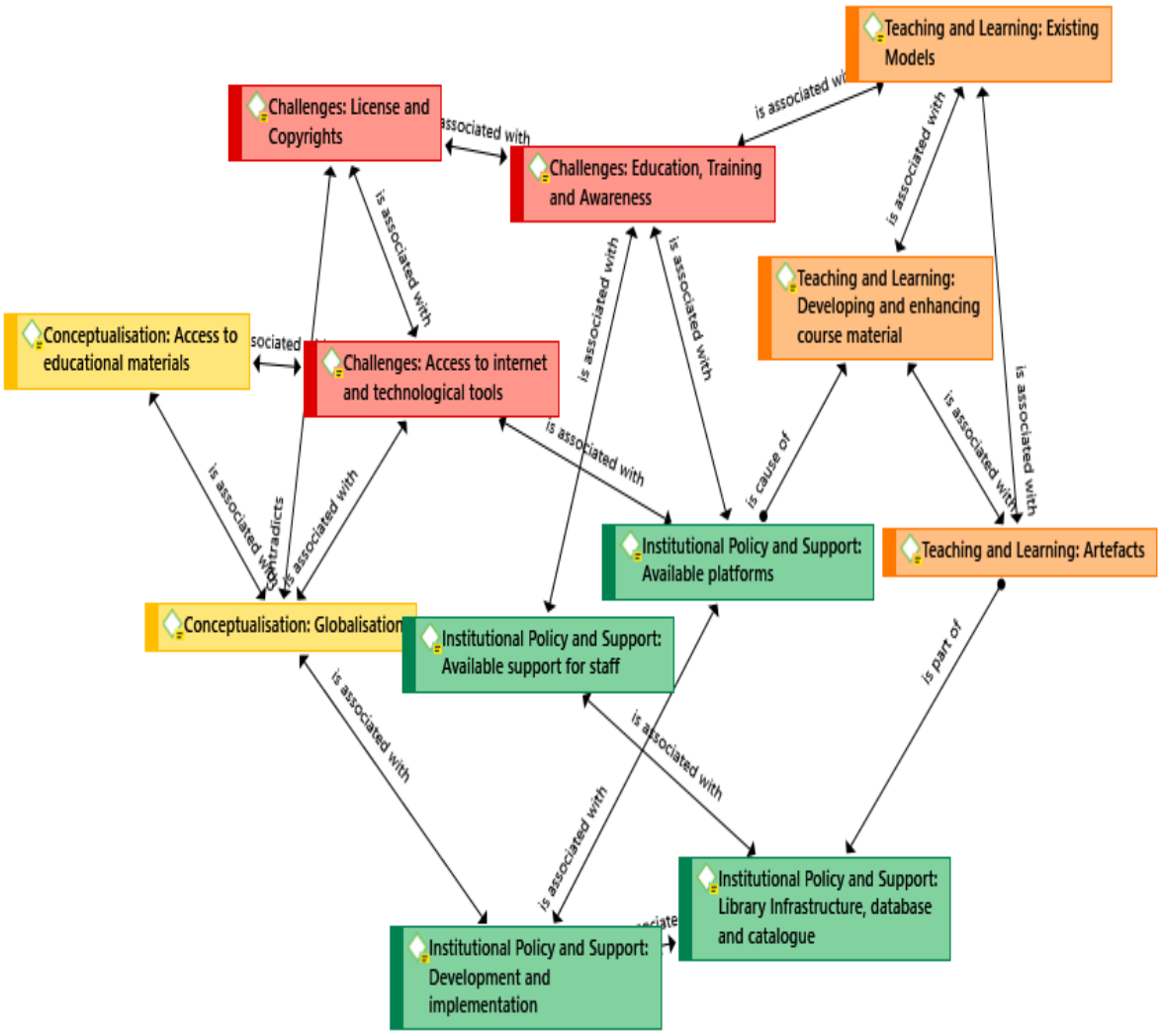


*Figure 5. 2: Interrelationship between themes and subthemes*

#### 5.2.4.1 Theme 1: Institutional policy and support

Theme 1 addresses the institutional policy support on the use of OER. There were two sub-themes that emerged from Theme 1 such as Sub-Theme 1.1: Institutional policy and support: Available platforms, Sub-Theme 1.2: Institutional policy and support: Available support for staff, Sub-Theme 1.3: Institutional policy and support: Development and implementation and Sub-Theme 1.4: Institutional policy and support: Library Infrastructure, database and catalogue. Raw data was also used for confirmation. The Figure 5.3 below illustrates Theme 1 and its four sub-themes.

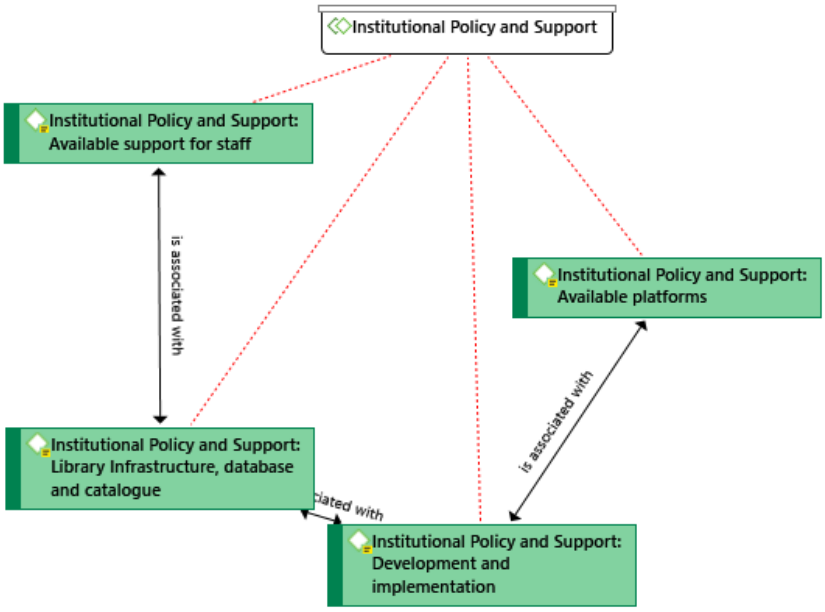


*Figure 5. 3: Schematic theme 1 and subthemes*

As indicated above Theme 1 such as Institutional policy and support encompasses four sub-themes namely: 1.1: Institutional policy and support: Available platforms, 1.2: Institutional policy and support: Available support for staff, 1.3: Institutional policy and support: Development and implementation and 1.4: Institutional policy and support: Library infrastructure, database and catalogue.

#### 5.2.4.1.1 Sub-Theme 1.1: Available platforms

The research participants indicated that as lecturers there exist available platforms enabled by their institutional policy to access OER. They indicated platforms like Youtube and SAIDE.

> ***Lecturer H**: Yes, not at the moment. What we are using are the things like maybe YouTube links and things like that. But next year, in the new Honours programme we have prescribed compulsory OER resources.*
>
> ***Lecturer O:** I have one from SAIDE which is on "What it means to be a teacher" and different approaches to teaching. I have one from Council on Higher Education that I am using. I have three diagrams that I am using as free content.*
>
> ***Lecturer R:** We use them. We use YouTube when providing further clarity on concepts. We also use YouTube and open textbooks.*

#### 5.2.4.1.2 Sub-Theme 1.2: Available support for staff

This sub-theme was common through the research process. The research participants expressed the need for staff support enabled by institutional policy. Furthermore, the research participants indicated the effect of little or no access to technological tools on the use of OER

> ***Lecturer H:*** *There is no support for OER. I will appreciate if we are made aware on how to evaluate an OER. We struggle with OER.*
>
> ***Lecturer B:*** *First of all, our university is still at an initial stage of developing a policy. - If OER policy can be one of our policies. Secondly, the issue of internet access needs to be given special attention.*
>
> ***Lecturer T:*** *I think subsidies on data will help lecturers and students. Accessibility to technology, instead of taking all NSFAS money to buy textbooks. We should buy tablets for students. We should also provide technological skills to lecturers and students on how to use OER in teaching and learning.*

#### 5.2.4.1.3 Sub-Theme 1.3: Development and implementation

Firstly, the research participants mentioned that there are no existing OER policies within the context that they work in.

> ***Lecturer K****: I will say that we do have existing policies, however implementation is a problem. Policy writers don't filter information such that it is known. The implementation of teaching and learning policies do encompass the concept of OER but not in more adequate way.*

Secondly, they declared that their current teaching and learning is has opportunities like copyright policy which makes provision for the use of technology enabled teaching and learning.

> ***Lecturer Q:*** *I just mentioned a Copyright policy because they really want university staff not to be caught in issues of plagiarism and stuff. It does support because it guide staff on how to use the internet information in a right way.*

#### 5.2.4.1.4 Sub-Theme 1.4: Library Infrastructure, database and catalogue

The research participants mentioned that their library infrastructure, database and catalogue has put more effort into enabling them to access technology-enabled educational resources like OER.

***Lecturer K:*** *If our Information Technology unit or in the library and colleges buy materials. The availability of such materials in the library through Information Communication Technologies*

***Lecturer O:*** *I am not sure how to define whether what I created is OER or just a resource for my module. I have not yet opened them up as OER. Our library offer their training.*

***Lecturer P:*** *As an institution we rely mostly on the library for OER use related services.*

#### 5.2.4.2 Theme 2: Conceptualisation

There were two sub-themes that emerged from Theme 2, namely Sub-Theme 2.1: globalisation and sub-theme 2.2: Access to educational materials as illustrated in the following figure 5.4.The theme describes the lecturers' conceptualisation of the OER concept.

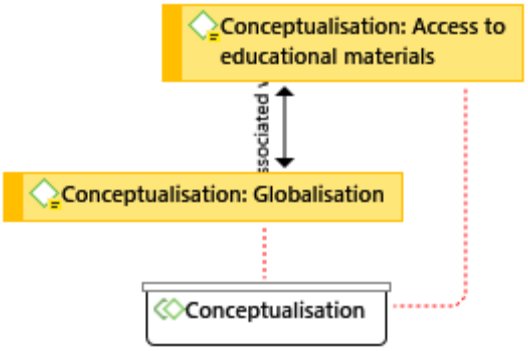


*Figure 5. 4: Schematic theme 2 and subthemes*

##### 5.2.4.2.1 Sub-Theme 2.1: Globalisation

Globalisation in this context will imply the general conceptualisation of OER. The research participants mentioned "United Nations" and "globalisation in their responses to indicate that that their conceptualisation of the OER concept.

***Lecturer L:*** *OERs are educational materials that are made open and accessible to anyone. We need information to be easily accessible. It is based on the recognition that the world is riddled with massive socio-economic inequalities. If that's the scenario, the United Nations as the global body is driving the agenda. It is important that the resources are made available to the poorest of the poor.*

***Lecturer T:*** *My understanding is very broad. It tells me of globalisation and participation on construction of knowledge, and digital development. It only becomes open educational resource because it works with digital, where we access document via the internet. It helps to access all sorts of information from all over the world.*

#### 5.2.4.2.2 Sub-Theme 2.2: Access to educational materials

Firstly, the research participants mentioned the internet as an important resource in their understanding on the use of OER in teaching and learning. They also indicated the internet as an enabler to the access of educational materials.

***Lecturer C:*** *It is about resources that you can get from the internet and use, you don't pay for them. You are supposed to get or request for permission. I can put them on the study guide.*

Secondly, the research participants mentioned the no cost of OER in their understanding of OER concept.

***Lecturer D:*** *It is the resources that are available on the internet for the use of anybody. You can use it in your course, you don't have to pay. It is extremely useful.*

Thirdly, the research participants mentioned the licensing aspect of OER in their understanding of OER concept.

***Lecturer G:*** *OER are materials that should be open, accessible, be re-used, repurposed to whatever context. My wish is that the issue of licensing must be communicated openly and it should be relaxed. If I create a material need to acknowledge it.*

### 5.2.4.3 Theme 3: Challenges

Below is the report on Theme 4: Challenges that emerged from the data. There were three sub-themes that emerged from Theme 4, namely, Sub-Theme 3.1: Access to the internet and technological tools, Sub-Theme 3.2: need for education, training and awareness and Sub-Theme 3.3: License and copyrights issues as illustrated in figure 5:5.Theme 3 introduced participants to reflect on the challenges associated with the use of OER in teaching and learning.

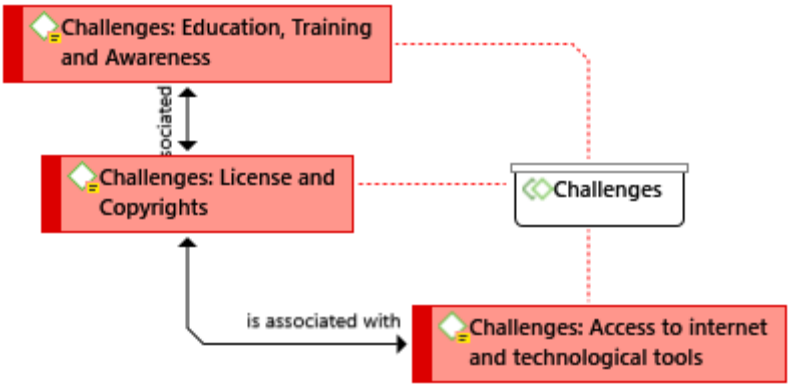


*Figure 5. 5: Schematic theme 3 and subthemes*

#### 5.2.4.3.1 Sub-Theme 3.1: Access to the internet and technological tools

Firstly, the research participants expressed their challenges with access to internet and technological devices.

> ***Lecturer A:*** *Issues of connectivity. We usually experience power cuts in the institution. Our institution is playing a role through Moodle to encourage the infusion of OER into courses.*

On the other hand, the research participants expressed lack of internet access hindered the implementation of OER in various universities. Apart from the benefits of using OER, lack of access to the internet discouraged the participants from using OER's in their teaching.

> ***Lecturer D:*** *It takes a lot of time to adapt. The other thing is that our students don't have access to the internet. Our internet is very terrible.*

Thirdly, the research participants expressed access of technological tools as one of the challenges on the use of OER in teaching and learning.

> ***Lecturer T:*** *I think subsidies on data will help lecturers and students. Accessibility to technology, instead of taking all NSFAS money to buy textbooks. We should buy tablets for students. We should also provide technological skills to lecturers and students on how to use OER in teaching and learning.*

#### 5.2.4.3.2 Sub-Theme 3.2: Need for education, training and awareness

Research participants expressed the need for education, training, and awareness of OER. Furthermore the research participants mentioned that they have not been trained on how to infuse OER into their teaching including how to access them. Throughout this study, the research participants have indicated a concern around little or no education, training and awareness regarding the OER,

***Lecturer P:*** *I haven't created my own OER. We have never been subjected to awareness or workshops.*

***Lecturer L:*** *I have not yet created any OER as I have not yet been orientated*

***Lecturer M:*** *I have not yet created any OER as am not yet been to a workshop*

#### 5.2.4.3.3 Sub-Theme 3.3: License and copyrights

Firstly, the research participants highlighted license and copyright as a hindrance to the use of OER in teaching and learning. Although research participants mentioned some platforms allowing for adaption, sharing and reproduction of teaching content, they identified their inability to take advantage of those platforms because of license and copyright issues.

***Lecturer Q:*** *I just mentioned a Copyright policy because they really want university staff not to be caught in issues of plagiarism and stuff. It does support because it guide staff on how to use the internet information in a right way*

***Lecturer G:*** *I cannot say we have OER at our institution. We are using materials like e-books. The only challenge is the licensing of these materials is with regard to the issue of licensing. When you hear about OER, you are told they open and freely accessible.*

On the other hand, research participants mentioned the need for information and training on copyright and license issues. This that Education, training and awareness on the use of OER must prioritise the license and copyright issues.

***Lecturer H:*** *I think being aware of how to access and how to use OER. We are put under pressure to publish in recognised and acknowledged journals. Initiatives like TESSA need to be aware of us. We need workshops on intellectual property.*

***Lecturer I:*** *Training, skills and knowledge particularly on copyright and license issues*

### 5.2.4.4 Theme 4: Teaching and learning

The below figure 5.6 illustrates Theme 4: Teaching and learning. This theme comprises three sub-themes, namely *Sub-Theme 4.1:* Artefacts*, 4.2:* Developing and enhancing course material *and sub-theme 4.3:* Existing Models *as illustrated in the following figure 5.6.*

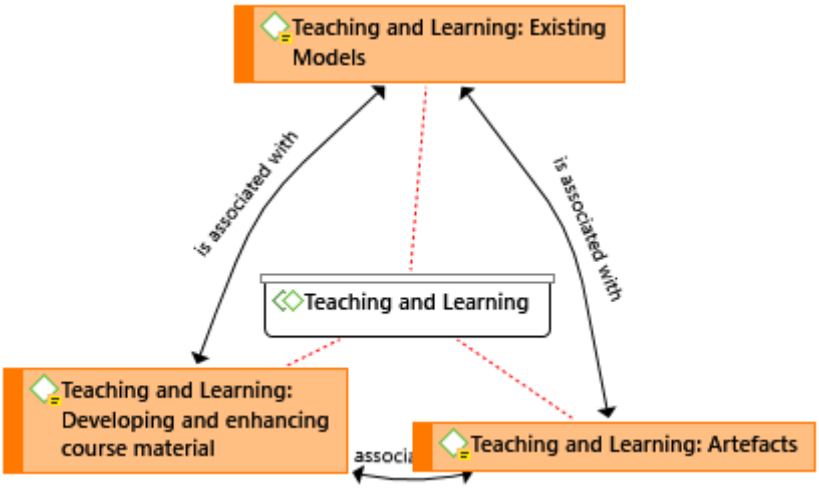


*Figure 5. 6: Schematic theme 4 and subthemes*

#### *5.2.4.4.1 Sub-Theme 4.1: Artefacts*

The research participants mentioned that they use artefacts such as YouTube videos, Open textbooks, e-books, reports and podcasts as an OER in their teaching practice.

> ***Lecturer L:*** *I use journals, e-books, reports and podcasts.*
>
> ***Lecturer M: I*** *like Google scholar because it helps us to get learning materials. I also YouTube.*
>
> ***Lecturer R:*** *We use them. We use YouTube when providing further clarity on concepts. We also use YouTube and open textbooks*

Secondly, the research participants mentioned that they outsource the OER from various platforms like OERAfrica and TESSA.

> ***Lecturer B:*** *I am using the OER material from TESSA.*
>
> ***Lecturer J:*** *The OER Africa and TESSA materials are the one I usually use in my teaching.*
>
> ***Lecturer B:*** *Students have written books in different home languages generated from TESSA.*
>
> ***Lecturer D:*** *Moodle has not been long but am using it to source out OER. It's like a process that has to go through. I would like to use more of OER.*

#### *5.2.4.4.2 Sub-Theme 4.2: Developing and enhancing course material*

Firstly, research participants mentioned that they use OER to develop and enhance the learning material. It seems that participants appreciated the impact that OER has on the depth of the curriculum.

> ***Lecturer N:*** *Well, on the module I am developing, 90% of the articles I am developing are OERs.*
>
> ***Lecturer H:*** *My course development involves some material that I took from the internet. We use textbooks that I supplement by OER.*

Secondly, research participants mentioned that they infused the OER into teaching by developing assessment plans and other forms of assessments. Research participants further mentioned that the use of OER into the course provided students with in-depth knowledge in specific areas of the syllabus.

> ***Lecturer J:*** *I am using OER in the Teaching Practice modules. We are developing materials and other materials has just been finalised for the new upcoming programmes. We have make use of OER and referrals as much as we can*

#### *5.2.4.4.3 Sub-Theme 4.3: Existing Models*

Research participants mentioned that they are not aware of the existing models that inform the infusion of OER into their teaching. In addition, the research participants were unable to mention a specific model that was guiding the purported use of OER in teaching and learning,

> ***Lecturer N:*** *I don't know of any models. We don't have a policy that prescribes any model.*
>
> ***Lecturer R:*** *Currently, I don't know of any model.*
>
> ***Lecturer P****: I am not sure about the models.*

### 5.3 Concluding remarks

This section reflected on the four themes that emerged on the participants 'responses during the face to face semi-structured interviews. The inference is that the drive to answer the research question led to the development of the four themes. The following section will present the qualitative data analysis in order to assist the integration of both the qualitative and the quantitative components of the study has been characterised.

## 5.4 Analysis of quantitative data

### SECTION A: 5.4 .1 - Demographic data of lecturers

Section A of the questionnaire through questions 1 to 10 sought to answer questions related to the personal information of respondents. The questions included respondents' gender, age, university placement, academic qualifications, professional qualifications, lecturing position, number of years as a lecturer, digital proficiency, training received on OER and level of training received on OER. A summary of the data obtained is presented in tables.5.4.1.1 Gender.

Question 1 was asked to categorise lecturers according to gender. Most of the respondents who took part in this study were females from the three universities making up 57.9% of the total participants as shown in the Table 5.3 below.

*Table 5. 3: Lecturers according to gender*

| | Frequency | Percentage |
|---|---|---|
| Male | 51 | 42.1 |
| Female | 70 | 57.9 |
| Total | 121 | 100 |

The minority group of males from the three universities made up the remaining 42.1%. The emerging picture on gender from the data does not reflect the number of lecturers from the three universities. The response rate particularly from the male lecturers was below expectations, even after the researcher made efforts to personally follow them up in their offices through several e-mailed reminders.

### 5.4.1.2 Age

Question 2 was asked to determine **the** lecturers' ages. The majority of the lecturers who responded to the questionnaires are in the category 41-50 making up 38% as shown in the Table 5.4 below.

*Table 5. 4: Lecturers according to gender*

| | Frequency | Percentage |
|---|---|---|
| 21-30 years | 8 | 6.6 |
| 31-40 years | 18 | 14.9 |

| | | |
|---|---|---|
| 41-50 years | 46 | 38 |
| 51-60 years | 41 | 33.9 |
| 61-65 years | 8 | 6.6 |
| Total | 121 | 100 |

The age category 51-60 made up 33.9%, category 31-40 made up 14.9% followed by both category 21-30 and 61-65 who each made up 6.6% respectively. It emerged from this data analysis that most (38%) of the lecturers are 41-50 years. This was followed by category of 51 to 60 years who comprised 33.9%.

#### 5.4.1.3 Current employment status

Question 3 was asked to determine the placement of lecturers among the universities. Most of the respondents who took part in this study were from UNISA making up 47.1% of the total participants as shown in the Table 5.5 below. UNISA was followed by TUT making up 36.4% and finally, UMP at 16.5%.

*Table 5. 5: Summary of the questionnaire responses*

| | Frequency | Per centage |
|---|---|---|
| Tshwane University of Technology | 44 | 36.4 |
| University of Mpumalanga | 20 | 16.5 |
| University of South Africa | 57 | 47.1 |
| Total | 121 | 100 |

#### 5.4.1.4 Highest qualifications

Question 4 was asked to determine lecturers' qualifications. The lecturers who are having the highest academic qualification are those with Master's degree qualification as shown in the Table 5.6 below.

*Table 5. 6: Lecturers' highest qualification distribution*

| | Frequency | Percentage |
|---|---|---|
| Honours | 7 | 5.8 |
| Masters | 90 | 74.4 |

| | | |
|---|---|---|
| Doctorate/PhD | 24 | 19.8 |
| Total | 121 | 100 |

The majority of the lecturers who responded to the questionnaires with Master's degree qualification make up 74.4%. The second group of lecturers with the second highest academic qualification were those with Doctorate/PhD, who made up 19.8% of the all respondents. The lowest number of responses was from those with Honours Degree making up 5.7%.

#### 5.4.1.5 Positions

Question 5 was asked to determine lecturers' positions**.** The highest group, made up of 57.8% of lecturers who responded to the questionnaire, serve in the lecturing category as shown in the Table 5.7 below.

*Table 5. 7: Lecturers according to positions*

| | Frequency | Percentage |
|---|---|---|
| Lecturer | 78 | 64.5 |
| Senior Lecturer | 25 | 20.7 |
| Associate Professor | 11 | 9.1 |
| Professor | 7 | 5.8 |
| Total | 121 | 100 |

The category that followed was that of senior lecturers who made up 16.50%. The associate professor category was the next, made up 9.09%. The last category is that of professor making up 5.7% of the total respondents.

#### 5.4.1.6 Experience

Question 6 was asked to determine lecturers' experience. The category 11-20 years had the highest number of lecturers as shown in the Table 5.8 below.

*Table 5. 8: Classification of lecturers according to experience*

| | Frequency | Percentage |
|---|---|---|
| 1-10 years | 46 | 38 |
| 11-20 years | 53 | 43.8 |

| | | |
|---|---|---|
| 21-30 years | 14 | 11.6 |
| 30+ years | 8 | 6.6 |
| Total | 121 | 100 |

The category 11-20 years made up 44.6% of the total number of respondents. Lecturers with 1-10 years' experience followed at 38.01%. The group of 21-30 years' experience followed and made up 10.7%. The group of 30+ year experience formed the minority making up 6.6%.

#### 5.4.1.7 Digital proficiency

Question 7 was asked to determine lecturers' digital proficiency. The category "intermediate digital competency" had the highest number making up 40.5% of lecturers who are digitally skilled as shown in Table 5.9 below.

*Table 5. 9: Lecturers according to digital proficiency*

| | Frequency | Percentage |
|---|---|---|
| Basic digital literacy | 40 | 33.1 |
| Intermediate digital competence | 49 | 40.5 |
| Advanced digital expertise | 32 | 26.4 |
| Total | 121 | 100 |

The category that followed was basic digital literacy making up 33.01%. The advanced digital expertise as the last category made up 26.4%. The implication is that most of the respondents in this category are already a step ahead in being ready to effectively integrate technological support systems like OER in teaching and learning.

#### 5.4.1.8 Training received on OER

Question 8 was asked to determine lecturers' level of OER training. The majority of the respondents (87.6%) as shown in the Table 5.10 below indicated having received no training on OER.

*Table 5. 10: Lecturers according to training received on OER*

| | Frequency | Percentage |
|---|---|---|
| Yes | 15 | 12.4 |
| No | 106 | 87.6 |

| | | |
|---|---|---|
| Total | 121 | 100 |

The minority of (12%) of the respondents received training on OER. Lecturers need to be trained on the use of OER in order to enable the universities to deliver quality teaching and learning. The advent of modern educational technologies means additional in-service training needs to be provided in order for lecturers to cope with new teaching and learning scenarios.

#### 5.4.1.9 Type of OER training received

Question 9 was asked to determine lecturers' type of OER training. The huge majority (87.6%) of the respondents as shown in the Table 5.11 below have not yet received training on OER.

*Table 5. 11: Lecturer distribution according to level of OER training received*

| | Frequency | Percentage |
|---|---|---|
| In-service | 15 | 12.4 |
| None | 106 | 87.6 |
| Total | 121 | 100 |

The remaining 12.4% received in-service training on the use of OER. The advent of new teaching approaches embracing OERs seems to be a challenge to the lecturers. The little or no training on the use of OER undermines the lecturer's ability to implement new skills in teaching and learning. The introduction of student-centred teaching strategies like co-operative teaching and learning methods is a challenge for the universities. Lecturers are pivotal in the implementation of the higher education system and therefore, training on OER should be part of any of the continuous professional development targeting lecturers.

### 5.4.2 Inferential statistics: ANOVA test on Section A

These statistics were calculated to investigate the policies guiding the use of OER at teacher education faculties/colleges at in South African universities.

### 5.4.3 Descriptive statistics

In reporting the results of statistical tests, one has to report the descriptive statistics, such as means and standard deviations, as well as the test statistics, such as degrees of freedom, obtained value of the test, and the probability of the result occurring by chance (p value). Test statistics and p values should be rounded to two decimal places (if one is providing precise p-

values for future use in meta analyses, 3 decimal places is acceptable). All statistical symbols (sample statistics) that are not Greek letters should be italicized (M, SD, t, p, etc.).

*Table 5. 12: Descriptive statistics: SA Universities*

| | N | Mean | Std. Deviation | Std. Error |
|---|---|---|---|---|
| TUT | 44 | 15.8 | 5.394 | 0.813 |
| UMP | 20 | 8.25 | 2.447 | 0.547 |
| UINSA | 57 | 9.67 | 3.552 | 0.471 |
| Total | 121 | 11.66 | 5.231 | 0.476 |

*Table 5. 13: One-way ANOVA: policies guiding the use of OER at teacher education faculties/colleges in South African universities.*

| ANOVA | | | | | |
|---|---|---|---|---|---|
| | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 1211.532 | 2 | 605.766 | 34.505 | .000 |
| Within Groups | 2071.576 | 118 | 17.556 | | |
| Total | 3283.107 | 120 | | | |

Table 5.15 displays a one-way between subject's ANOVA that was conducted to compare the effect of policies guiding the use of OER at teacher education faculties/colleges in South African universities. There was a significant effect of the policies guiding the use of OER at teacher education faculties/colleges at in South African universities at the $p<.05$ level for the three conditions [$F (2, 118) =34.505$, $p = 0.000$]. Information in Table 5.15, a Post hoc comparisons using the Tukey HSD test indicated that the mean score for the three South African Universities i.e. TUT (M = 15.8, SD = 5.39) was significantly different than the UMP (M = 8.25, SD = 2.44). However, UNISA (M = 11.66, SD = 5.23) did not significantly differ from the TUT and UMP. Taken together, as indicated by table 5.15, these results suggest that the impact of the policies guiding the use of OER at teacher education faculties/colleges in South African universities is very minimal. It can be identified from the table that there is an average

of mean= 8.25 (SD 2.447) to mean = 15.43 (SD 15.8). The average is above p=0.00 for significance, hence, a very minimal impact as stated earlier.

There appears to be an interrelationship of correlation between responses received from the participants here and that of the face to face semi-structured interview (cf, 5.2.4.4.3). In the semi-structured interviews, participants mentioned that there are no existing OER policies within the context they work in. The minimal impact of policies guiding the use of OER indicated here confirms the non-existence of policies guiding the use of OER.

### 5.4.4 Inferential statistics: ANOVA test on Section B

To explore how OER is conceptualised by lecturers at teacher education faculties/colleges in South African universities.

*Table 5.14: Descriptive Statistics: SA Universities*

| | N | Mean | Std. Deviation | Std. Error |
|---|---|---|---|---|
| TUT | 44 | 26.27 | 10.904 | 1.644 |
| UMP | 20 | 13.25 | 3.985 | 0.891 |
| UINSA | 57 | 17.49 | 5.971 | 0.791 |
| Total | 121 | 19.98 | 9.315 | 0.847 |

*Table 5. 15:One-way ANOVA: Conceptualisation of the use of OER and adaptation by lecturer.*

| ANOVA | | | | | |
|---|---|---|---|---|---|
| | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 3001.244 | 2 | 1500.622 | 23.894 | .000 |
| Within Groups | 7410.723 | 118 | 62.803 | | |
| Total | 10411.967 | 120 | | | |

Based on the information in Table 5.13, a one-way ANOVA was conducted to compare the effect of OER use conceptualisation and adaptation by lecturers in selected universities. There

was a statistically significant effect of OER as conceptualised by lecturers at teacher education faculties/colleges in South African universities at the p<.05 level for the three conditions [F (2, 118) = 23.894, p = 0.000]. As displayed in Table 5.13, the Post hoc comparisons using the Tukey HSD test indicated that the mean score for the three South African Universities, i.e. TUT (M = 26.27, SD = 10.90) was significantly different than the UMP (M = 13.25, SD = 3.98). However, UNISA (M = 19.98, SD = 9.31) did not significantly differ from the TUT and UMP. Taken together, as indicated by Table 5.13, these results suggest that the impact of the conceptualisation of OER by lecturers at teacher education faculties/colleges in South African universities is very minimal. It can be identified from the table that there is an average of mean= 13.25 (SD 3.985) to mean =26.27(SD 10.904). The average is above p=0.00 for significance, hence, a very minimal impact as stated earlier. The responses received in Section B of the survey questionnaire (question 64) correlates (confirmed) well with the responses as indicated Theme 1 (cf, 5.2.4.1.2). On the face to face semi-structured participants indicated that the conceptualisation of OER is not a challenge. It was however, noted that there was no connection between their conceptualisation of OER with their teaching and learning activities.

### 5.4.5 Inferential statistics: ANOVA test on Section B

The aim here is to research the challenges faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities.

*Table 5. 16: Descriptive statistics: SA Universities*

| University | N | Mean | Std. Deviation | Std. Error |
|---|---|---|---|---|
| TUT | 44 | 15.43 | 3.985 | 0.601 |
| UMP | 20 | 8.9 | 3.712 | 0.83 |
| UINSA | 57 | 10.32 | 2.935 | 0.389 |
| Total | 121 | 11.94 | 4.377 | 0.398 |

*Table 5. 17: One-way ANOVA: challenges faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities*

| ANOVA | | | | | |
|---|---|---|---|---|---|
| | Sum of Squares | df | Mean Square | F | Sig. |

| | | | | | |
|---|---|---|---|---|---|
| Between Groups | 871.684 | 2 | 435.842 | 36.042 | .000 |
| Within Groups | 1426.911 | 118 | 12.092 | | |
| Total | 2298.595 | 120 | | | |

A one-way between subject's ANOVA was conducted to compare the effect of the challenges faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities. The effect of challenges faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities was significant at the $p<.05$ level for the three conditions [$F (2, 118) = 36.042$, $p = 0.000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the three South African Universities i.e. TUT (M = 15.43, SD = 3.98) was significantly different than the UMP (M = 8.9, SD = 3.71). However, UNISA (M = 11.94, SD = 4.37) did not significantly differ from the TUT and UMP. Taken together, as indicated by Table 5.17, these results suggest that the impact of challenges faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities is very minimal. It can be identified from the table that there is an average of mean= 8.9 (SD 3.712) to mean = 15.43 (SD 3.985). The average is above p=0.00 for significance, hence, a very minimal impact as stated earlier.

The minimal impact of the challenges related on the use of OER by lecturers indicated here is confirmed by the responses of Theme 3 (cf, 5.2.4.3.2). On the face to face semi-structured interview questionnaire, the participants indicated that the need for education, training, and awareness of OER discourages them on the use of OER in teaching. The lack of skills and training in using OER has an impact on the participant's willingness to use OER in their teaching. The respondents could not have experienced challenges regarding the use of OER as they are still reluctant to use OER in their teaching and learning.

### 5.4.6 Inferential statistics: ANOVA test on Section D

To develop a model that will guide lecturers at teacher education faculties/colleges in South African universities on the use of OER in their teaching.

*Table 5. 18: Descriptive statistics: SA Universities*

| | N | Mean | Std. Deviation | Std. Error |
|---|---|---|---|---|
| Tshwane University of Technology | 44 | 7.59 | 1.499 | 0.226 |
| University of Mpumalanga | 20 | 5.25 | 2.447 | 0.547 |
| University of South Africa | 57 | 5.65 | 1.695 | 0.225 |
| Total | 121 | 6.29 | 2.023 | 0.184 |

*Table 5. 19: One-way ANOVA: a model that will guide lecturer's use of OER in their teaching at teacher education faculties/colleges at in South African universities.*

**ANOVA**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 119.507 | 2 | 59.754 | 18.986 | .000 |
| Within Groups | 371.369 | 118 | 3.147 | | |
| Total | 490.876 | 120 | | | |

A one-way between subject's ANOVA was conducted to compare a model that will guide lecturers' use of OER in their teaching at teacher education faculties/colleges in South African universities. There was a significant effect of the model that will guide lecturers' use of OER in their teaching at teacher education faculties/colleges in South African universities at the $p<.05$ level for the three conditions [$F(2, 118) = 18.986$, $p = 0.000$]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the three South African Universities i.e. TUT (M = 7.59, SD = 1.49) was significantly different than the UMP (M = 5.25, SD = 2.44). However, UNISA (M = 5.65, SD = 2.02) did not significantly differ from the TUT and UMP. Taken together, as indicated by table 5.19, these results suggest that the impact of a model that will guide lecturer's use of OER in their teaching at teacher education faculties/colleges at in South African universities is very minimal. It can be identified from the table that there is an average of mean= 5.25 (SD 2.447) to mean = 7.59 (SD 1.499). The average is above p=0.00 for significance, hence, a very minimal impact as stated earlier.

There is a positive correlation between the responses received in this part of the survey questionnaire and that of the face to face semi structured interview questionnaire. The existence or non-existence of OER models in the universities had a minimal impact on the use of OER by lecturers. Participants reported that they are not aware of the existing models that inform the infusion of OER into their teaching (cf, 5.2.4.2.3).

### 5.4.7 Independent T-test

The aim here was to run up on the responses on all sections of the questionnaire, apart from Section A which looked at the biographical data of respondents. An independent t-test was carried out to ascertain the differences in trends among male and female respondents in Section B to F of the survey questionnaire. A summary of the responses by respondents is presented on table 5.20

*Table 5. 20: T-test for male and female respondents*

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. Deviation | Std. Error Mean |
| Conceptualisation of the use of OER and adaptation by lecturers | Male | 51 | 12.14 | 2.538 | .355 |
| | Female | 70 | 25.70 | 8.220 | .983 |
| Policies on the use of OER and adaptation | Male | 51 | 7.69 | 2.140 | .300 |
| | Female | 70 | 14.56 | 4.907 | .586 |
| Challenges faced by lecturers in the use of OER and adaptation | Male | 51 | 8.29 | 2.571 | .360 |
| | Female | 70 | 14.60 | 3.394 | .406 |
| Views on the models on use of OER and adaptation and OER in general | Male | 51 | 4.57 | 1.769 | .248 |
| | Female | 70 | 7.54 | 1.031 | .123 |

### 5.4.6.1 Conceptualisation of the use of OER and adaptation by lecturers according to gender

*Table 5. 21: Descriptive statistics of the conceptualisation of the use of OER and adaptation by lecturers according to gender*

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. Deviation | Std. Error Mean |
| Conceptualisation of the use of OER and adaptation by lecturers | Male | 51 | 12.14 | 2.538 | .355 |
| | Female | 70 | 25.70 | 8.220 | .983 |

Table 5.21 group statistics output of the sample sizes (N), means, standard deviations, and the standard error of the mean are provided for each group (males and females). The current study identifies the following: an average mean of 12.14 for the conceptualisation of the use of OER and adaptation was determined for the 68 males in the sample, with a standard deviation and standard error of 2.538 and .355 respectively. Similarly, there were 41 females and their conceptualisation of the use of OER and adaptation averaged 25.70, with a standard deviation and standard error of the mean of 8.220 and .983 respectively.

*Table 5. 22: Levene's Test for Equality of Variances for Conceptualisation of usage of OER*

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
| Conceptualisation of the use of OER and adaptation by lecturers | Equal variances assumed | 59.341 | 0.00 | -11.383 | 119 | 0.000 | -13.563 | 1.192 |
| | Equal variances not assumed | | | -12.981 | 86.198 | 0.000 | -13.563 | 1.045 |

The assumptions of the t test for independent samples were tested based on visual inspection of the normality of the distribution of mean level of the use of OER by lecturers at South African universities and the “Levene’s test for equality of variance” (Wagner, Kin, Lynch, 2012 :222). There does appear to be significant deviation from normality, based on Table 5.22. Furthermore, homogeneous variances are assumed (F = 59.341, p = .000) using the 5% level of significance. Thus all assumptions are satisfied the requirements.

Based on the results of the study, there is sufficient evidence to say that male and female lecturers in South African Universities conceptualise the use and adaptation of OER differently are different (t (119) = -11.383, p=.000). The mean and standard deviation among male lecturers in South African universities are M = 12.14 and SD = 2.538, and for females’ M = 25.70 and SD = 8.220, indicating a significant difference in the conceptualisation of the use of OER and adaptation by lecturers between male and female South African university lecturers, using the 5% level of significance. The null hypothesis is rejected, in favour of the hypothesis that there is evidence of the difference in the conceptualisation of OER use and adaptation by between male and female lecturers.

#### 5.4.6.2 Policies on the use of OER and adaptation by lecturers according to gender

*Table 5. 23: Descriptive statistics of the policies on the use of OER and adaptation according to gender*

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. Deviation | Std. Error Mean |
| Policies on the use of OER and adaptation | Male | 51 | 7.69 | 2.140 | .300 |
| | Female | 70 | 14.56 | 4.907 | .586 |

From table 5.23 above, the independent t-test was conducted to establish group statistics output of the sample sizes (N), means, standard deviations, and the standard error of the mean for each group (males and females). The current study identifies the following: an average mean of 7.69 for the policies on the use of OER and adaptation was determined for the 51 males in the sample, with a standard deviation and standard error of 2.140 and .300 respectively. Similarly, there were 70 females and their views on the policies on the use of OER and adaptation averaged 14.56, with a standard deviation and standard error of the mean of 4.907 and .586 respectively.

*Table 5. 24: Levene's Test for Equality of Variances*

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | |
|---|---|---|---|---|---|---|---|
| | | F | Sig. | T | df | Sig. (2-tailed) | Mean Difference |
| Policies on the use of OER and adaptation | Equal variances assumed | 87.752 | 0.000 | -9.364 | 119 | 0.000 | -6.871 |
| | Equal variances not assumed | | | -10.433 | 100.3 | 0.000 | -6.871 |

The assumptions of the t test for independent samples were tested based on visual inspection of the normality of the distribution of mean level of the policies on the use of OER and adaptation and the "Levene's test for equality of variance" (Wagner et al., 2012, p. 222). There does appear to be a significant deviation from normality. Furthermore, homogeneous variances are assumed (F = 87.752, p = .000) using the 5% level of significance. Thus all assumptions are satisfied.

Based on the results of the study, there is sufficient evidence to say that the policies there is difference between male and female lecturers in South African universities in terms of OER use and adaptation (t (119) = -9.364, p=.000). The mean and standard deviation of male South African Universities lecturers are M = 7.69 and SD = 2.140, and for females' M = 14.56 and SD = 4.907, indicating a significant difference in policies on the use of OER and adaptation between female and male lecturers, using the 5% level of significance. The null hypothesis is rejected, in favour of the hypothesis that there is evidence of the difference between male and female respondents regarding policies on OER use and adaptation.

### 5.4.6.3 The challenges faced by lecturers in the use of OER and adaptation by lecturers according to gender

*Table 5. 25: Descriptive statistics of the challenges faced by lecturers in the use of OER and adaptation*

| **Group Statistics** | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. Deviation | Std. Error Mean |

| | | | | | |
|---|---|---|---|---|---|
| Challenges faced by lecturers in the use of OER and adaptation | Male | 51 | 8.29 | 2.571 | .360 |
| | Female | 70 | 14.60 | 3.394 | .406 |

From table 5.25 above, the independent t-test was conducted to establish the group statistics output of the sample sizes (N), means, standard deviations, and the standard error of the mean for each group (males and females). The current study identifies the following: an average mean of 8.29 for challenges faced by lecturers in the use of OER and adaptation determined for the 51 males in the sample, with a standard deviation and standard error of 2.571 and .360 respectively. Similarly, there were 70 females and their views on the challenges faced by lecturers in the use of OER and adaptation averaged 14.60, with a standard deviation and standard error of the mean of 3.394 and .406 respectively.

*Table 5. 26: Levene's Test for Equality of Variances*

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | |
|---|---|---|---|---|---|---|---|
| | | F | Sig. | T | df | Sig. (2-tailed) | Mean Difference |
| Challenges faced by lecturers in the use of OER and adaptation | Equal variances assumed | 21.697 | 0 | -11.138 | 119 | 0 | -6.306 |
| | Equal variances not assumed | | | -11.626 | 118.8 | 0 | -6.306 |

The assumptions of the t test for independent samples were tested based on visual inspection of the normality of the distribution of mean level of the challenges faced by lecturers in the use of OER and adaptation and the “Levene’s test for equality of variance” (Wagner et al., 2012, p. 222). There does appear to be a significant deviation from normality. Furthermore, homogeneous variances are assumed (F = 21.697, p = .000) using the 5% level of significance. Thus all assumptions are satisfied.

Based on the results of the study, there is sufficient evidence to say that the challenges faced by lecturers in the use of OER and adaptation between male and female lecturers in the South African Universities differ (t (119) = -11.138, p=.000). The mean and standard deviation of

male South African Universities students are M = 8.29 and SD = 2.571, and for females' M = 14.60 and SD = 3.394, indicating a significant difference in the challenges faced by lecturers in the use of OER and adaptation between females and males, using the 5% level of significance. The null hypothesis is rejected, in favour of hypothesis that there is evidence of the difference between males and females regarding the challenges faced by lecturers in the use and adaptation of OER.

#### 5.4.6.4 Views on the models on use of OER and adaptation and OER by lecturers according to gender

*Table 5. 27: Descriptive statistics of views on OER use and adaptation models and OER in general*

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | Gender | N | Mean | Std. Deviation | Std. Error Mean |
| Views on the models on use of OER and adaptation and OER in general | Male | 51 | 4.57 | 1.769 | .248 |
| | Female | 70 | 7.54 | 1.031 | .123 |

From table 5.27 above, the independent t-test was conducted to establish the group statistics output of the sample sizes (N), means, standard deviations, and the standard error of the mean for each group (males and females). The current study identifies the following: an average mean of 8.29 for views on the models on use of OER and adaptation and OER in general determined for the 51 males in the sample, with a standard deviation and standard error of 1.769 and .248 respectively. Similarly, there were 70 females and their views on the models on use of OER and adaptation and OER in general averaged 7.54, with a standard deviation and standard error of the mean of 1.031 and .123 respectively.

*Table 5. 28: Levene's Test for Equality of Variances*

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | 95% Confidence Interval of the Difference | |
| Views on the models on use of OER and adaptation | Equal variances assumed | 29.604 | 0.000 | -11.624 | 119 | 0.000 | -3.481 | -2.468 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| and OER in general | | | | | | | | |
| | Equal variances not assumed | | | -10.749 | 74.506 | 0.000 | -3.526 | -2.423 |

The assumptions of the t test for independent samples were tested based on visual inspection of the normality of the distribution of mean level of views on OER use and adaptation models and OER in general and the “Levene’s test for equality of variance” (Wagner et al., 2012, p. 222). There does appear to be a significant deviation from normality. Furthermore, homogeneous variances are assumed (F = 29.604, p = .000) using the 5% level of significance. Thus all assumptions are satisfied.

Based on the results of the study, there is sufficient evidence to say that views on OER use and adaptation models and OER in general differ between male and female lecturers South African universities (t (119) = -11.624, p=.000). The mean and standard deviation of male South African Universities lecturers are M = 4.57 and SD = 1.769, and for females’ M = 7.54 and SD = 1.031, indicating a significant difference in views on OER use and adaptation models and OER in general, using the 5% level of significance. The null hypothesis is rejected, in favour of hypothesis that there is evidence of the difference between male and female respondents regarding views on OER use and adaptation models and OER in general.

### 5.5 Concluding remarks

In this chapter, the researcher presented the views of the lecturers emerging from his discussion with them during the interviews. The interviews led to the emergence of four themes. There were four broad themes developed for this study, namely conceptualisation, teaching and learning, challenges and institutional policy and support. The developed themes assisted the researcher to develop a survey questionnaire to enrich the interview responses.

The researcher integrated the qualitative component of the study with that of quantitative. In the final analysis, the conclusion that emerged from this section is that there is little or no use of OER at South African universities.

# CHAPTER 6: SUMMARY, DISCUSSION OF FINDINGS, LIMITATIONS, RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH

## 6.1 Introduction

The prime aim of this study was to design an instructional framework that can be used to empower lecturers at South African universities to effectively implement the use of OER in their daily teaching and learning. This study was undertaken through literature review, as well as practical research. Consequently, research findings and recommendations are made considering the literature review on OER use in teaching and learning at South African universities and the empirical results.

The preceding chapter 5 presented the empirical findings of the study aimed to explore the use of OER in teaching and learning by lecturers at South African universities. Data was collected through semi-structured interviews, closed-ended questionnaire and document analysis.

This chapter begins by firstly presenting the summary of chapters done thus far. Secondly, the discussion of findings with regard to the research aims and in terms of literature review as indicated in chapter 2 and 3 and the empirical research reported in chapter 4 and 5. The limitations of the study are then outlined followed by recommendations in terms of literature review and the empirical research. Lastly, areas for further research are outlined for the sake of future research in relation to this research.

Wright and Reju (2012:194) suggest that expenses on educational materials in Africa can be reduced if African countries use OERs. Moreover, the literature emphasised the potential of OER to support developing countries in attaining their Sustainable Development Goals (SDGs) (McGreal, 2017). In this chapter, a discussion of findings is done in line with the broad themes identified in the analysis as well as the research questions outlined in Chapter 1. The discussion of the findings also invokes the literature reviewed in Chapter 2.

## 6.2 Summary of chapters

**CHAPTER 1**: this chapter entails an orientation of the study. It established the background to the study, stated the problem, research questions and objectives and lastly, the significance of the study. This chapter also identified the research design and methodology adopted to conduct an investigation of the problem.

**CHAPTER 2**: this chapter presents the integrated theoretical framework which underpins the study and formed a blue print on which the study was built. The broad learning theories that

underpin this study are: DOI, Activity theory, TRA, UTAUT and TAM. The researcher examined the theories in order to demonstrate their connection to the use of OER.

**CHAPTER 3:** this chapter presents the literature review on the use of OER covering such issues as conceptualisation of OER by lecturers, the use of OER in teaching and learning, challenges on the use of OER and OER institutional policy and support. It ends with presenting trends on the use of OER in the world.

**CHAPTER 4**: this chapter outlines the methodological approach of the study which highlights the research design and the research paradigm adopted to explore the views of lecturers on the use of OER at teacher education faculties in South African Universities. This chapter outlines the study population, the sampling procedure and the study sites. Additionally, this chapter put forward the data collection instruments, data collection procedure and the data analysis process. Ultimately, the approaches employed to ensure trustworthiness of the study are described, factors that limit the study, as well as the ethical issues that the study deemed are described.

**CHAPTER 5:** this chapter presents the data analysis and interpretation of findings from the semi-structured interviews and questionnaires. Data is presented based on the themes that emerged from the data itself in order to answer the research question. This chapter also presents a discussion of the findings to respond to the research questions and sub-questions as highlighted in Chapter 1. This chapter highlights the findings that come out of the data and creates the relationship between the findings and existing literature reviewed in Chapter 3.

**CHAPTER 6**: this chapter presents the researcher's academic deliberation and puts forward recommendations emerging from the study to address the challenges related to the use of OER as experienced by lecturers at teacher education faculties in South African Universities. This chapter further underlines the manner in which the findings of the study contribute to the body of knowledge and submits areas for further research in the field of OER.

**CHAPTER 7:** this chapter presents an OER instructional framework proposed by the researcher to address the challenges as experienced by lecturers at teacher education faculties in South African Universities in the use of OER.

### 6.3. Discussion of findings

After data collection and analysis, the four themes that emerged and the measures of frequency are as reported below. It should be recalled that the initial purpose of this study was to investigate the use of OER by lecturers at teacher education faculties in selected South African Universities. The realisation of the purpose of this study was established on the main

research question and the four sub-questions as indicated in Chapter one (see number 1.5). The following is the main question the study sought to answer:

**How lecturers use OERs for teacher education delivery effectiveness at South African universities?**

To respond to the question, the study exhibits the research findings which emerged from both the literature review and theoretical framework (chapter 2 and chapter 3), and the empirical studies (Chapter 5) to develop a discussion of findings. The following are some of several key findings discussed based on the sub-questions in the subsequent sections.

### 6.3.1. Findings with regard to the first research question and the aim of the study:

What policies guide the use of OER as educational resources in the teacher education faculties in South African universities? The responses for this question were drawn using both the qualitative and quantitative research methods.

#### 6.3.1.1 Institutional Policy and Support

In respect of section 5.2.4.1, the study shows that the institutional policy and its support can have a crucial effect on the use of OER in teaching and learning. The study conducted by Arinto, Hodgkinson-Williams & Trotter (2017) on OER and OEP in the Global South reveal that OER policies appears as positive accounts guiding the publish OER, however, they are unable to engage with practical implications of use and reuse. The responses from the research participants indicated some negative experiences regarding the instructional policy and support regarding the use of OER in teaching and learning. With regard to section 5.4.6.2, the t-test revealed a significant difference between female and male lecturers at in South African Universities in both OER use policies and adaptation. Therefore, there is significant difference in mean autonomy scores for females and males. In respect of section 5.4.2, a one-way ANOVA was conducted to compare the effect of policies guiding the use of OER at teacher education faculties/colleges in South African universities. The average is above p=0.00 for significance, hence, a very minimal impact.

#### 6.3.1.1.1 Available platforms

With regard to section 5.2.4.1.1**,** the collected data indicates that lecturers are constantly visiting the platforms like OER Africa, TESSA, SAIDE, Moodle, Siyavula and Opentextbooks in trying to search for OER on the net. Lecturers are aware of the importance of this platforms and it appears that they often infused these platforms into their teaching practices. Their visit of these platforms is often unplanned and it usually happens on a need basis. Lecturers also use these platforms to refer students to additional learning material. The lecturers cited that

they only have easy access to YouTube and Openbooks as the only type of resources to serve as OER in their teaching and learning. The lecturer's use of these internet based resources is not directed by any institutional policy and as a result their visit to these platforms is only for their consumption. Lecturers are as a result accidentally using the 5Rs use of OER.

Consistent with the connectivist learning theory, it is clear that lecturers are involved in distributed learning populated by digital tools and also enhanced by technology (Naidoo, 2020:90). There is however, lack of policy guided use of OER for the lecturers. A study conducted by Sabadie, et al., (2014:6) made an assertion that whereas OER is a priority of policy agenda for many HEIs and higher education stakeholders, its use at schools, universities and adult education institutions has not reached a critical entrance. The research participants further mentioned that there is no institutional policy and support for the use of OER in their teaching and learning.

#### 6.3.1.1.2 Available support for staff

Regarding section **5.2.4.1.2,** discovery learning is often employed by lecturers using OER to prepare their teaching and learning activities. The lecturers are experimenting on Youtube links as their own initiative to enhance their teaching and learning. This assertion is confirmed by Hodgkinson-Williams (2010:16) who posited that "…the creation of OER is still based on the voluntary contribution of academics from HEIs even from large-scale OER initiative such as MIT OCW". Lecturers in the study were found to be inventive on their ways and means of inter-relating the use of OER with their teaching practice. In line with Rogers Diffusion theory, the attempt of using freely available educational resources on the net lead lecturers to embrace OER as a positive idea, resulting in the adoption of an innovation (Katz, 2019:3). Lecturers mentioned that they have no support in using OER's. It seems that the lack of support has a direct bearing on the interest of using OER's. In contrast, for the universities that have strategic plan in implementing the OER's, there seem to be no support in assisting participants to implement OER's into their teaching.

There is currently a need for OER to be an integral part of educational policies and practices from early childhood education to post-secondary, technical vocational educational training, higher education, lifelong learning and teacher training (UNESCO, 2017:1). It is the researcher's opinion that the development of national policies on the use of OER in teaching and learning can go a long way in forming a crucial support that can assist the extensive use of OER in teaching and learning. More so, this support can impact hugely on the quality of teaching and learning and also assist in transforming teaching approaches to meet the current educational needs. The findings of this study align with the connectivism theory which encourages the distributed learning through digital tools and enhanced by technology.

#### 6.3.1.1.3 Development and implementation

With reference to section 5.2.4.1.3, and as confirmed by scholars (Trotter & Hodgkinson-Williams, 2018; Kanwar, 2020), many educational institutions do not have OER strategies or policies, but rely on their Intellectual Policies (IP) to strengthen their national copyright legislation with regard to their possession of copyright over their lecturers' educational materials. The majority of lecturers mentioned that there are no existing OER policies within the context that they work in. ROER4D (2017:4). Posit that lack of institutional policy support which should guide lecturers in the teaching and learning practice could be imputed on the South African universities' lack of strategic aim to enable their lecturers to openly share their teaching and learning resources. However, a small number of the lecturers mentioned that they have guidelines or policies which inform the implementation of OER into their teaching. In some cases, there are existing policies however, there is less implementation. The fact that 67% of lecturers lack awareness on the use of OER particularly with regard to the effects on teaching and learning is also a confirmation on lack of policy support regarding the use of OER.

In contrast, some lecturers' contentment towards the copyright policy which has a provision for technology-enabled teaching, like the use of OER. This finding aligns with the connectivism theory which encourages the distributed learning through digital tools and enhanced by technology. They mentioned that it guide lecturers on the proper use of internet. It seems like the copyright policy is being regarded as an OER policy. However, there is a need for the adequate support of the research participants in any way as a way of enabling them through any of the teaching and learning guidelines on the OER and how to implement them in teaching and learning.

Research findings indicates that lack of OER policy or institutional policies encompassing the use of OER in teaching and learning can lead to the teaching practice being unable to embrace the new teaching approaches. The study established that apart from UNISA which has an OER strategy, all other HEIs taking part in the study do not have OER policy nor teaching and learning policies recognising the OER. Lecturers knew little about OER and its use in teaching and learning because of the absence of guiding policies. Those lecturers who indicated the deployment of OER in their teaching and learning were not following any policy guidelines. The minimal impact of policies guiding the use of OER indicated here confirms the non-existence of policies guiding the use of OER.

#### 6.3.1.1.4 Library Infrastructure, database and catalogue

With regard to section 5.2.4.1.4, lecturers indicated satisfaction with the support they get from their library infrastructure, database and catalogue. They mention that it has put more effort in enabling them to access technology-enabled educational resources like the OER. The library infrastructure, database and catalogue is suitably positioned to provide lecturers with access to OER. It seems that the resources from the library database allowed lecturers to have exposure to OER. The library plays an important role in access to OER but also provides lecturers with access to e-articles which are important for research activities such as the writing of articles. The library forms part of support and plays an important role in fulfilling some of the components of access to information in the policy. Therefore, the library can be seen as playing a role of connecting the participants to the various database of knowledge which can inform the teaching practice, curriculum design and research activities.

The study findings suggest that the resources accessed from the library database allowed participants to have exposure to OERs. The findings of this study align with the Diffusion of Innovation Theory by Rogers (2003) which illustrates the movement of a new innovation through the structures of a university for its adoption. Morudu (2019:8) confirms that In this era of new educational technologies, there is a growing need for librarians tasked with the training of library users to nurture an understanding of how these changes affect their use of library services (The library as part institutional policy support was shown to OER compliant in that it allowed the participants the necessary platforms to explore the OER. Although the 50% of participants did indicate lack of policy support in the use of OER, the study reveals that the libraries are best resourced to establish a sound OER enabled teaching and learning. The library plays an important role in access to OER but also provides participants with access to articles which are important for research activities such as writing articles.

### 6.3.2. Findings with regard to the second research question and the aim of the study:

How lecturers at teacher education faculties are conceptualising OER as educational resources in South African universities? The responses for this question were drawn using both the qualitative and quantitative research methods.

#### 6.3.2.1 Conceptualisation

With regard to section 5.2.4.2, the conceptualisation of OER to the lecturers is vital to their adoption or rejection in their teaching practice. The knowledge of this concept is crucial to the OER movement as it is frequently misunderstood to mean “free of charge” (Johnson, Becker, Estrada & Freeman, 2014:10). However, some lecturers are resisting the use educational resources freely and openly available on the net due to a lack of knowledge about their source

of origin and fear of using low quality resource. (Mtebe & Raisamo, 2014:249). The study has established that the 80% of the participants interviewed in this study expressed their awareness of OER as including educational material. The study was able to adopt the definition of UNESCO (2012) and that of Madiba (2018) in trying to seek understanding of the concept of OER (*cf*. 3.3). Both the two definitions expressed the open licensing of OER. The study as indicated in revealed that lecturers differed in their definition and understanding of OER. Access to educational materials was a critical component in their definition and conceptualisation of OER. While 67%of the lecturers attempted to define the concept of OER, it became apparent that there was a huge dissimilarity in the process of them clarifying the concept. Sixty seven percent of the lecturers mentioned OER as resources that are easily accessible on the internet. Twenty-five percent of the lecturers did mention open licensing in their conceptualisation of the concept. Lecturers explained by conceptualising OER based on their understanding. Lecturers further explained the benefits they derive from use of OER. With reference to section 5.4.4, the t-test revealed a significant difference in the average OER conceptualisation scores for male and female lecturers in South African Universities respectively. Therefore, there is significant difference in mean autonomy scores for females and males.

#### 6.3.2.1.1 Globalisation

With reference to section 5.2.4.2.1, the lecturers were of the opinion that OER is a strategy for the development of fourth industrial revolution. This sub-theme included the advancement of technological tools which are in line with the fourth industrial revolution. They view OER as demonstrating a provision to guide to answer the equal access to education. Lecturers mentioned that OER is meant for the globalisation, development and advancement of knowledge within various disciplines. Most of the lecturers except four had an idea of the term OER. They were able to conceptualise OER in their own words. Nonetheless, four participants namely Lecturer E, Lecturer O, Lecturer R and Lecturer S were unable to clearly conceptualise OER. Mishra & Singh (2017:464) confirms that notwithstanding the penetration of OER in many countries education systems, many studies have indicated inadequacies in the awareness and understanding of OER among faculty members. It was noted that apart from OER being regarded as open access to knowledge, that on the higher level of understanding, OER is about developing and advancing knowledge systems while exposing local knowledge to the international/global platforms. .

#### 6.3.2.1.2 Access to educational materials

With reference to section **5.2.4.2.2**, the lecturers expressed their understanding of OER as including educational material. All lecturers placed much value on the freely accessing of educational materials on the net. Access to educational materials was a critical component in

defining and conceptualising of OER. Lecturers related OER to concepts such as access to e-materials. They acknowledged that the internet plays a pivotal role in the accessing of materials and enhances flexibility in not confining studying to physical walls by indicating the following:

OER are defined as “teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no cost access, use, adaptation and redistribution by others with no or limited restrictions” (Paris OER Declaration, 2012). Though participants have an idea on OER, the picture being painted from the lecturer’s responses indicates that their conceptualisation of OER needs to lead to its continued application in their teaching and learning. According to lecturers, the definition of OER encompasses the open access, which is described as the exposure of local knowledge to global knowledge. It is understood that OER refers to the development of knowledge through the use of technological tools. These findings are consistent with those mentioned by Butcher, et al., (2015:8) who identified OER as the teaching and learning materials made available either in the public domain or under an open licence However some participants conceptualised OER with reference to cost. Cost of educational materials was a critical component in conceptualising OER as confirmed below: Some of the lecturers place emphasis on the licensing of OER in their conceptualisation of OER.

Lecturers were indicative of the fact that their awareness of the concept on OER does not have an effect on them implementing the use of OER in teaching and learning. The 87, 6% of the participants like Lecturer C were not trained in the OER (cf. 5.2.1.8), but they still confidently showed that they were conversant with the concept. The research findings also revealed that lack of awareness among lecturers does not have a bearing on their views about the potential of the use of OER in teaching and learning.
In terms of the level of awareness amongst the three universities participating in the study, the findings indicated that levels of OER awareness among the three universities differ. Confirming this finding, literature indicated that the awareness levels differ at various higher education institutions (MISHRA, 2018:63). 80% lecturers are aware about the OERs even though their perception about the use of OER is not encouraging. In terms of training, the findings indicated the little understanding on OER displayed by lecturers indicated lack of skills and orientation to enabling them to easily implement OER in teaching and learning. By having a clear understanding on OER and how to integrate it in teaching and learning, participant’s

chances of lessening challenges of achieving the independent learning principles will be reduced.

Findings in this study show that self-regulation and self-directedness amongst the participants was the factor in them gaining the awareness and knowledge of the OER concept through the infusion of e-books with other materials in the practices (*cf.* 5.2.4.1: Theme 2). As a consequence, there is provision on the use of OER in teaching and learning in terms of continuous professional development which lecturer initiated and directed. Moreover, Misra (2014:382) confirms the foregoing by suggesting that OER based online training can assist lecturers to access applicable quality continuous professional development to those universities that are still to implement OER formally in their teaching and learning.

These findings are also consistent with the result of ANOVA test (>p=0.00) which was conducted in order to account for the conceptualisation of OER by lecturers in South African Universities. These results suggest that the impact of the conceptualisation of OER by lecturers at teacher education faculties/colleges in South African universities is very minimal. The researcher deducted from the findings that participants were only aware of OER but have no understanding of the use of OER in teaching and learning.

The findings of this study align with the connectivism theory which encourages the use and sharing of open educational resources.

### 6.3.3. Findings with regard to the third research question and the aim of the study:

What are the challenges faced by lecturers at teacher education faculties in the use of OER as educational resources in the teaching and learning in South African universities? The responses for this question were drawn using both the qualitative and quantitative research methods.

#### 6.3.3.1 Challenges

Apropos to section 5.2.4.3, the large volumes of OER currently made available on the net is a challenge particularly the lecturers who are expected to navigate through them before integrating them in their teaching practice. Butcher & Moore (2015:13) adds that notwithstanding large number of well-resourced and quality OERs in global repositories, there is little evidence of integrating them into teaching and learning (Butcher & Moore, 2015:13). Lecturers have confirmed to be lacking knowledge on searching, accessing of OER and, most importantly also not knowing how to integrate them into teaching and learning (ibid, 2015:13). This study revealed various challenges experienced by faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities. The findings for this theme suggested that there are multiple challenges faced by lecturers on the use of OER. This current study found the following as major challenges to the use of OER in teaching and learning: lack of awareness, access the internet and technological tools,

education, training and awareness and license and copyrights (*cf,* Chapter 3.4). Participants are faced with several challenges hindering their efforts in effectively executing the teaching and learning practice. With regard to section 5.4.6.3, the t-test revealed a significant difference on the challenges faced by lecturers in the use of OER and adaptation between female and male lecturers at in South African Universities. Therefore, there is significant difference in mean autonomy scores for females and males. Regarding section 5.4.5, a one-way ANOVA was conducted to compare the effect of the challenges faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities. The average is above p=0.00 for significance, hence, a very minimal impact.

#### 6.3.3.1.1 Lack of OER understanding

In relation to section 5.2.4.2.2 and 5.2.4.4.1, lecturers mentioned little or no understanding of the OER concept. According to Belikov & Bodily (2016:240) the most usual negative perceptions of OER were founded to be a lack of understanding of what OER specifically imply. Lecturers all three universities showed signs of little or no understanding with regard to the OER. Some participants in an effort to respond to the question on types of OER they use in their teaching and learning indicated “they use videos” which cannot be referred to as OER. This finding showed the similarity amongst the three universities with regard to lecturers’ level of understanding of the OER concept. It seems that there have been little or no professional development interventions directed at orientation towards the understanding of the OER concept. The understanding of the concept of OER by lecturers is essential for a smooth its smooth use in teaching and learning. The little or no understanding of the OER concept was identified as playing a role in the lecturer’s reluctance to use OER in their teaching and learning. Eighty-five percent of Lecturers need to have positive impression on the concept of OER by being capacitated in order to have clear understanding of the concept. The Diffusion of Innovation Theory by (Rogers, 2003) suggests in its innovation-decision process that educational innovations are products that lecturers will embrace if a positive idea about that innovation is established (Katz, 2019:3). As a matter of fact, there is a dire need for professional designed interventions by universities that inculcate positive impression of the OER concept on the lecturers.

#### 6.3.3.1.2 Access the internet and technological tools

In connection to section 5.2.4.3.1, lecturers expressed their challenges with access to internet and technological devices. Lack of internet access hindered the implementation of OER in various universities. Compatible to the findings of this study, Pete, Mulder, Neto and Omollo (2018) observed that there is a sizeable difference with regard to the internet accessibility and the exceedingly low level of satisfaction with the internet connection at technical universities in contrast to the comprehensive universities.

The findings of this study support the foregoing observations on the challenges of access the internet and technological tools to the use of OER in teaching and learning. In the main, this challenge indicates that most of the lecturer's willingness to use OER in teaching and learning at South African universities is discouraged. The lack of access to modern technological tools like computer and the internet are challenges hindering the use of OER (Percy, et al., 2012:4). Lecturers expressed their challenges with regard to little or no access to internet and technological devices.

From the findings it is clear that access the internet and technological tools is a challenge. This is similar to the observations of Butcher, et al., (2015:18) who found that the adoption of OER in teaching and learning is lack of access to digital devices and the internet. Ngimwa, et al., (2012:403) conclude that technological issues have been identified as a barrier to successful participation in OER development.

Apart from the benefits of using OER, lack of access to the internet discouraged the participants from using OER's in their teaching. However, as a result of past post-1994 discriminatory regulations the access to internet is extremely unequal (Dalvit, Kromberg, & Miya, 2014:89). The issue of ICT was identified as a barrier to successful participation in OER development (Ngimwa & Wilson, 2012:403).Percy et al., (20120 page numbers) recommend the urgent intervention regarding finding solutions to poor technological infrastructure disabling the use of OERs.

The findings confirm that the lack of internet access hinders the implementation of OER at various universities. This finding suggests that apart from the benefits of using OER, lack of access to the internet discouraged the participants from using OERs in their teaching. University management and university communities need to be eager to enable the use of educational technologies like OER in teaching by advocating for robust ICT policy. In contrast with connectivism theory which emphasises the importance of internet connections (Mudaly, 2012:47), this section revealed that South African universities are still challenged with access to internet and technological tools.

#### 6.3.3.1.3 Inadequate education, training and awareness

With reference to section 5.2.4.3.2, lecturers mentioned that they were not subject to neither education and training nor the awareness around the use of OER. This is in contrast to Olanrewaju and Ikuereye (2019:109) who argue that everyone particularly those involved with teaching and learning should be trained to have basic technological skills. The finding is consistent with the findings of Pounds and Bostock (2019:708). They identified the usage of OER to be dependent on increasing awareness, increasing transparency around quality and developing training in the use of technology and best practice for using OER. The availability

of millions of freely available high quality teaching and learning resources remains a fruitless effort due to barriers related to the lack of OER skills. OER use and adaptation means putting down an OER into different learning circumstances from that for which it was originally planned and developed (Abeywardena, 2012:5).

Phalachandra and Abeywardena (2016:16) pointed out that lack awareness, lack of time, access to technology, computer literacy, and low internet connectivity remain crucial obstacle to the use of OER to many users. The current study identified lack of education, training and awareness as one of the critical challenges facing lecturers on the adoption and use of OER. Butcher and Moore (2015:30) agrees that the professional development of lecturers should be executed through OER incorporated courses. No adoption of any educational technology like the OER can be embraced without the users not being aware of it. Hence, in some countries particularly in Africa, what is required for the effective use of OER in teaching and learning is availability of strategies that has the capacity to ensure that there is adequate awareness on the concept of OER. Therefore, one of the major hindrances afflicting the use of OER in teaching and learning is lack of efforts from governments to advance the use of OER through putting more emphasis on effective awareness campaigns intending on increasing its use. In view of Bliss, Robinson, Hilton, and Wiley (2013:1) who confirms the foregoing by arguing that in spite of the awareness campaigns put in place globally, there is still more to be done to advance the development and use of OERs in teaching and learning platforms.

Shadowing awareness is education and training endeavours which also remained a key challenge in the use of OER in teaching and learning. As confirmed in literature because of lack of the education and training on the use of OER, Ng'ambi, et al., (2013:235) argued that the teaching value of OER therefore not yet evident. The study also found lack of the education and training as another impediment on the use of OER in the teaching and learning. This is closely related to the issue of awareness. This finding confirmed with previous studies (Kisanga and Ireson, 2015; Madiba, 2018). With reference to the study conducted by Kisanga, et al., (2015:134) found lack of training as a challenge to any support to be given in the teaching and learning. The findings of this doctoral study found that 87, 6% of the participants in the study indicated that training is an effective strategy to address lack of support and teachers' resistance to change. According to a study by Madiba (2018 page number) who interviewed eighteen selected lecturers from University of Free State in South Africa. The purpose of this latter study was to investigate the perceptions and experiences of lecturers from the University of the Free State (UFS) regarding their integration of OERs in teaching and learning. The study reported that there is a lack of awareness among lecturers on OERs

and how they can be integrated into teaching and learning. Lecturers need to be trained in the creation, use and reuse of learning materials in order to take advantage of the OER potential in their course development. (Panke, 2011:1432).

#### 6.3.3.1.4 Lack of awareness on license and copyrights

With respect to section 5.2.4.3.3, lecturers mentioned that awareness on license and copyrights issues was one of the impediments to the use of OER in teaching and learning.

Firstly, lecturers mentioned the need for information and training on copyrights and license issues. Literature define copyright as traditionally understood to be the restriction of access to knowledge to few elites (Madiba, 2018:69). Furthermore, copyright has been reported to open up the possibilities for sharing knowledge and has positive suggestions for teaching and learning as demonstrated by Creative Commons licences as new vision of copyright (Chow, 2010:2). There are challenges with regards to license and copyright of the material. This aspect relates to the gap in policy since some institutions have limited access to material due to license and copyright issues. Lecturers also mentioned that they need information and training on copyrights and license issues. It seems that the license and copyright issues hinder the access to OER, and as such participants are less likely to make use of OER when they experience copyrights and licenses. While lecturers have the agency to decide whether to use OER in their teaching, the institution would need to decide whether it wanted to openly license and share the teaching materials that it holds copyright over. Cox, & Trotter (2017:303).

On the other hand, the study established that lecturers are limited in understanding Creative Commons which a license to the publication of OER in order is to guide their use in teaching and learning. Furthermore, this study found that that participants need training and clarity on copyrights and license issues particularly regarding their right to publication ownership. Whilst the results indicated that 12.4% of the participants received in-service training on the use of OER, there was no evidence of their knowledge regarding the copyrights and license issues. The assumption this study makes is confirmed by the findings of Karipi (2020:139) who referred Self-learn as a way that that emerged to enable lecturers to know about OER. She further suggests that OER enable opportunities for professional development without the assistance of institutions (ibid).

The survey results in Tables 5.18 support this finding. For instance, Table 5.18 shows that there was a significant effect of the challenges faced by lecturers at teacher education faculties/colleges in the use of OER in their teaching and learning in South African universities at the $p<.05$ level for the three conditions [$F (2, 118) = 36.042$, $p = 0.000$]. This finding has implications for South African policymakers to emphasise the use of OER in their teaching and learning policy development.

These findings not only indicated the effect of challenges on the use of OER in teaching and learning, but also the need for a comprehensive professional development regarding issues around the use of OER. Lecturers expressed the need for education, training and awareness of OER. 87, 6% of the participants mentioned that they have not been trained on how to infuse OER into their teaching including how to access them. The lack of skill and training in using OER has an impact on the participant willingness to use OER in their teaching. Therefore, there need to be training that will encompass Information communication and technologies (ICT) and the integration of OER into teaching. Finally, there needs to be more awareness of OER. Policy development and implementation need to take into consideration the training needs of lecturers in using OER.

**6.3.4. Findings with regard to the fourth research question and the aim of the study:**

To what extent can scholarly publications and the findings of this study be used to develop and describe a proposed OER distribution framework that will guide lecturers' use of OER as educational resources in teaching and learning at teacher education faculties in South African universities? The responses for this question were drawn using both the qualitative and quantitative research methods.

**6.3.4.1 Teaching and learning**

In respect of section 5.2.4.4, the objective is to examine whether lecturers at selected South African universities use OER in teaching and learning. Consequently, the face to face interviews focused on how lecturers integrate OER in their teaching and learning. The 'use of OER' used in this study entails lecturers ability to utilise and adapt free available material on the net in their teaching and learning. The results showed that sixteen (16) out of twenty-two (24) faculty members interviewed indicated that they are not certain as to whether the material they use in their teaching and learning is OER.

The study shows that the lecturer's knowledge of OER models have an effect on the use of OER in teaching and learning The concept of OER subscribes to the practice of sharing resources which enables the enhancement of teaching and learning practices and new innovation in teaching (Mishra, 2017:371). Kanwar, Kodhandaraman and Umar et al. (2010:77) point out that most HEI who were characterised by traditional governance structures and teacher-cantered pedagogic models are changing to a learner-cantered and decentralized approach. The discussion in chapter indicates OER models are crucial in the use of OER in teaching as encourage collaborative development of educational modules and courses around the world. The findings of this study align with the connectivism theory which encourages the use and sharing of open educational resources and Diffusion of Innovation Theory by Rogers (2003) which illustrates the movement of a new innovation through the structures of a

university for its adoption. In respect of section 5.4.6.4, the t-test revealed a significant difference in views on OER use and adaptation models, between female and male lecturers in South African Universities. Therefore, there is significant difference in mean autonomy scores for females and males. With regard to 5.4.6, a one-way ANOVA was conducted to compare a model that will guide lecturers' use of OER in their teaching at teacher education faculties/colleges in South African universities. The average is above p=0.00 for significance, hence, a very minimal impact.

#### 6.3.4.1.1 Artefacts

About section 5.2.4.4.1, lecturers indicated positive experience towards the use of artefacts like e-books, videos and other forms of multimedia material to enhance teaching and promote a student-centred approach to learning. The lecturers cited that their attempt to use this artefacts in their teaching practice enhance the self-regulation and self-directedness in relation to the teaching and learning. This is indicated by lecturers mentioning that they designed their own teaching artefacts while they outsourced other from various OER platforms including YouTube. The findings of this study align with the connectivism theory which encourages the use of digital tools and Diffusion of Innovation by Rogers (2003) five categories of adopters which identifies this lecturers as innovators.

Lecturers also indicated a feeling of satisfaction towards the YouTube videos which forms part of their teaching and learning. However, the use of YouTube does not necessarily means the use of OER. *Lecturers* in an effort to respond to the types of OER they use in their teaching and learning indicated "they use videos" which cannot be referred to as OER. This buttress Belikov & Bodily (2016:240) who indicated lecturer's lack of understanding of the use of OER as a hindrance.

#### 6.3.4.1.2 Developing and enhancing course material

With respect to section 5.2.4.4.2, lecturers mentioned that they use OER to develop and enhance the learning material. Lecturers highlighted an appreciation on the impact that OER has on the depth of the curriculum. Furthermore, lecturers mentioned that they infused the OER into teaching by developing assessment plans and other forms of assessments. However, lecturers expressed a need for other curriculums to integrate OER into their courses from a pedagogy perspective. The findings of this study align with the connectivism theory which encourages the use of digital tools and Diffusion of Innovation by Rogers (2003) five categories of adopters which identifies this lecturers as innovators.

The lecturers' responses indicates that OER also improves the learning experiences of students. Participants mentioned that the integration of OER into the course provided students with in-depth knowledge in specific areas of the syllabus. The OER improved the student

engagement with learning material and therefore promotes deep learning. This is in line with Madiba (2018:27) who posited that the sustainability of the use of OER hang on the solid global communication networks infrastructure that the Internet continues to provide.

#### 6.3.4.1.3 Existing Models

As regard to section 5.2.4.4.3, lecturers reported that they are not aware of the existing models that inform the infusion of OER into their teaching. There could be various reasons for these findings. This could be influenced by the notion that there has been less policy implementation in the use of OER. Furthermore, this could also be explained by the lack of training, support, and awareness of OER platforms. However, the fact that participants could not isolate a specific model, may also mean that they have a flexible approach in infusing OER into their teaching. It might also suggest that they may are infused in the process that they have integrated their experience without having to refer to a specific model.

The researcher identified contradictions on participants' responses: some mentioned that they use OER to develop and enhance the learning material while others indicated that they infuse OER into teaching by developing assessment plans and other forms of assessments. However, not all lectures use the same approaches to their teaching and learning. The researcher is of the opinion that although some lecturers are aware about the potential of integrating OER in their teaching and learning, they nonetheless continue to rely much on the traditional face to face approaches to teaching and learning. Ninety-two per cent of lecturers are supposed to embrace OER as appropriate approach that is designed to positively influence quality teaching.

Examining the participants' responses, it is concluded that the little or no policy guidelines on the use of OER, the lecturers are involved in self-learning when coming to OER mainly because of lack of training, support, and awareness of OER platforms. However, the fact that participants could not isolate a specific model, may also mean that lecturers use OER as additional resources in their teaching and learning practices. It might also suggest that they may use OER as additional resources without having to refer to a specific model. The researcher reached the conclusion that although lecturers could not express the OER models they use to implement flexible approach in the use of OER in teaching and learning, there is a little evidence of some lecturers attempt on experimenting with the use of OER in teaching and learning. Models like USU OCW need to guide South African universities in benefiting from OER in their teaching guided by the guidelines. West.et al., (2011:21) posit that models like USU OCW It aims to provide the global population with an opportunity to access quality teaching and learning opportunities.

It is worth mentioning that even though lecturers have displayed lack of knowledge on OER models, that couldn't be associated with those factors that make them reluctant from using OER in their teaching and learning. ANOVA analysis (*cf* 5.4.5: Table 5.18) also revealed that there is positive correlation (>p=0.00) between the responses received in this part of the survey questionnaire and that of the face to face semi structured interview questionnaire. The existence or non-existence of OER models in the universities had a minimal impact on the use of OER by lectures. Participants reported that they are not aware of the existing models that inform the infusion of OER into their teaching.

### 6.4 Limitations of the study

This study was affected by some shortcomings or constraints. Some of these constraints are highlighted below:

1. OERs and their use in teaching and learning are still a new concept and are hindered by little or no access to internet or technical tools. Currently there is a need for practical studies attempting to investigate "the role of access to internet and technological tools on the use of OER in teaching and learning". Past studies are mostly focused on OER in teaching and learning, neglecting the important part played by access to internet and technological tools in enabling OER accessibility.
2. There are limited studies conducted on OER in an African context. The little knowledge and understanding of the concept of OER limited the researcher's range regarding eligibility of participants of the study. For example, most of the prospective participants of this study enquired from the researcher on what the concept entails when they were invited to participate. It is estimated that up to 90% of the expressions from the participants emanated from their perspective of OER rather than from their OER experiences. This culminated in some responses from the participants not being captured in the research findings as they were not relevant to the subject.
3. The study is limited in its sampling of universities because only three universities were sampled. The sample of this study was drawn only from among lecturers of selected teacher education faculties / colleges at universities in Gauteng and Mpumalanga Province due to the limited time and resources available for the study. An ideal sampling process of participants would have a representative university from all the provinces of South Africa. Therefore, it is not representative of the entire population of lecturers in South Africa. Tertiary education in South Africa varies from province to province in the country. Consequently, the study findings might not be relevant to all universities in South Africa. The sample presented only three public universities from two provinces in South Africa. There should also be further research focusing on

private universities. Also, the sample of this study was chosen because of its likelihood to furnish the researcher with reliable information, given the assumption that their location has adequate internet connectivity.

4. It was difficult to access the study participants as the country was on COVID-19 pandemic lockdown. Consequently, the researcher was forced to change the ethical clearance and protocols by reapplying for ethical clearances certificates. The researcher was limited by time constraints to collect data during COVID-19 pandemic lockdown. It was also difficult to collect data in the second phase involving the closed-ended questionnaire which initially targeted 200 participants in the three institutions but the response rate after one month didn't even surpass one-third of the targeted 200 returns. The researcher then personally contacted the universities to activate the responses.
5. The researcher was prevented, by the financial constraints around the study, from including a wider sample. Notwithstanding the limitations and the identified areas of further research, this study has achieved its objectives of understanding how lecturers use OER in teaching and learning at South African universities and served as a sample benchmark study for researchers in other territories with similar geographical settings.

### 6.5 Recommendations

The findings suggest the importance of the including OER in teaching and learning practices. Based on the findings of the study on the lecturer's use of OER in teaching and learning, the following recommendations, from both the literature review and the findings from the empirical study, are made:

#### 6.5.1 Revisit of existing OER policy and amendment of OER legislation

There is a need to review the teaching and learning policies at South African universities to consider factors that contribute to lecturer's use of OER in teaching and learning. There should be a paradigm shift that involves deviating from direct teaching to teaching and learning focusing on the students. It is therefore recommended that clear teaching and learning policies be introduced to guide lecturers on the integration of OERs in teaching and learning at universities. The policy will address aspects such as:

a) **OER Awareness campaigns**

It is recommended or suggested that the South African Government advances the use of OER through emphasis on effective awareness campaigns intending on increasing its use. South Africa's universities need to take leaf from the government by also intensifying awareness on OER among their internal and external stakeholders in order to get them to embrace OERs.

This should enable the said stakeholders to easily implement OERs in teaching and learning. The awareness programmes can be used as a platform to explain OER related issues while concurrently instilling a sense of ownership within the academic community. OER awareness raising should not emphasize OER awareness in isolation but also ensure that institutions have structures with an understanding of the use of OER in teaching and learning. A structure that is strategically positioned to continuously market OER is the library. Librarians need to work closely with the OER office in order to identify content for the repository and increase OER deposits. Both the library and the Institutional OER unit are concerned with educational material issues, therefore, it is important that they collaborate to ensure that there are clear marketing mechanisms for the library to use to intensify OER awareness. Their collaboration should lead to increased OER visibility in the institution.

Universities also need to leverage the power of social media as a platform to strategically create OER awareness within their communities. However, the Institutional OER unit needs to also have the capacity to adequately guide the use of the particular social media platforms to be used for the purposes it was intended for. The university communities, particularly the lecturers, need to be aware of what OER constitute and their relevancy to teaching and learning.

**b) Government policy towards the amendment on OER strategy**

The study reveals that despite the evidence of a few attempts by lecturers to use OER in their teaching and learning, there is a need for clear policies guiding the use of OER in teaching and learning at South African universities. However, the fact that the current national government has made an attempt in its policy formulation to recognize OER is not yet translated into awareness and understanding on the use of OER in teaching and learning. Therefore, support and guidance in the form of national government policy that focuses primarily on the use of OER is needed. In such a national government policy, HEIs should specifically be mandated to handle the logistics of OER issues around teaching, learning and research.

The national government policy on OER should encourage universities to have library databases compatible with new educational technologies like OER. This study further revealed that the resources accessed from the library database in some HEIs enabled some participants exposure to OERs. It is suggested that the library, as part institutional support, should also be mandated by the national government policy on OER to specifically devote some of its database to OER. The library as part institutional support to teaching, learning and research was shown to be OER compliant in that it served the participants as the necessary

platform to explore OER. It is also suggested that national government policy should mandate institutional libraries to create space for experience sharing seminars and enhance the collaborative use of OER in the teaching and learning environment.

**c) OER license and copyrights issues**

The findings established generally little or no knowledge around the issues of license and copyrights issues.The study also revealed that the lack of policy guidelines on the use of OER impacts on lecturers' awareness on license and copyrights issues in the universities studied. It is recommended that institutional policies guiding teaching, learning and research be reviewed, not only to guide the use of OER but also to raise awareness and knowledge on open licences like the Creative Commons' that provide lecturers with free perpetual permission to engage in 5R activities.

Institutional policies guiding lecturers on license and copyright issues should, for example, aim at ensuring that lecturers have knowledge of creative commons licences that permit the sharing, adaptation and distribution of OER. Similarly, such policies should ensure guidelines for the teaching and learning communities to ethically use OER in teaching and learning and discourage abuse of openly available educational material on the net.

The university library is an institutional structure that is crucial to teaching, learning and research. The university librarians need to be continuously capacitated as there are at the forefront of the implementation of any new development in the teaching, learning and research. University librarians should be armed to educate the university community on issues around information sharing and management. The study recommends that university librarians should be capacitated to provide lecturers with the required information on license and copyright issues, particularly the creative commons licences. Continuous training is also important in ensuring the effective sharing, adaptation and distribution of OER by lecturers and to update them on these creative commons licences.

### 6.5.2 OER as resources for practice

OER resources, including internet and other technological tools which are critical in combining theory to practice, need to be made available to lecturers. The little or no availability of Institutional OER units, internet and technological tools hinder the use of OER in teaching and learning. It is therefore recommended that Institutional OER units, the internet and other technological tools be part of resources for OER teaching and learning practice.

#### 6.5.2.1 Establishment of an institutional OER unit

It is recommended that an Institutional OER unit should be established in every HEI to be able to specifically and critically engage with all OER related issues. The establishment of institutional OER units should be informed by research-based evidence in order to inform its scope and responsibilities on OER creation and integration. The institutional OER unit needs to strategically develop a roadmap to ensure an OER awareness, education and training campaign is effectively implemented.

The components of the Institutional OER unit in the form of administrative personnel, professional personnel and technical personnel need to be complementary and supplementary to each other. These parts have to work in a clear line of collaboration and order, to reflect a good institutional OER system. The institutional OER unit and policies must be updated continuously according to the needs and changes brought by emerging technologies on teaching and learning.

#### 6.5.2.2 Continual professional training and development on OER

The current study revealed that there is a need for the curriculum transformation in use of OER in universities. Regarding the lecturer, professional training and development toward the OER strategy is a must. The participants in the study indicated the dire need for professional training as one of the prerequisites for the use of OER in teaching and learning. It is suggested that initial teacher education and in-service continuous professional development should put more emphasis on development of knowledge and skills to successfully use OER in teaching and learning. Furthermore, DHET needs to collaborate with universities to ensure that lecturers are empowered to enhance their use of OER in teaching and learning practices.

The assumption in this study is that the overwhelming majority of lecturers are not using OER in their teaching and learning. The study was also able to suggest that most lecturers were interested in using OER in teaching and learning. This suggests that universities need to initiate and support efforts to improve lecturer's use of OER in teaching and learning. The provision of professional training on OER for university lecturers is essential. The provision of professional training of lecturers on OER is believed to be able to improve the level of self-directed learning. The universities' strategic plan must make it compulsory for the professional training of lecturers to integrate OER training.

#### 6.5.2.3 Access to the internet and other technological tools

The study suggested that access to the internet and other technological tools plays a crucial part in the use of OER by lecturers at universities. Access to the internet and these technological tools are a great opportunity for university faculties to improve the content and pedagogical aspects of both the teaching and learning practices. The study found that inadequate access to the internet and technological tools are an obstacle to the use of OER in teaching and learning**.** Consequently, lecturers are missing out on the freely available educational resources on the net that could enrich their teaching and learning practices. Given this limited or no access to the internet and technological devices by lecturers, it can be concluded that the access to internet and technological devices is still to be prioritised as the crucial foremost enablers of the use of OER in teaching and learning activities. This lack perpetuates the use traditional methods of teaching and learning and defeats the aims of student-centred approaches of teaching and learning.

It is suggested that HEIs, with the support of their governments, should prioritise the establishment of fully functional internet connections and the acquisition of technological devices to support the technology-enabled teaching and learning in their budgetary processes. There should be more access to technological devices and strong internet connectivity to increase the level of access to the freely available educational materials on the net for lecturers and students. Moreover, it is recommended that lecturers and students be equipped with proper skills to use internet and the technological devices. HEIs, with the support of the government, should ensure proper technological infrastructures are developed, well maintained and enable easy access to internet and technological tools in the lecturer rooms

### 6.6 Contribution to OER policy, theory and practice

#### 6.6.1 Contribution to theory of OER

This study was informed by the combination of theories like Roger's diffusion of innovation theory, activity theory, TRA, UTAUT and TAM to understand the use of OER at South African universities. However, the study was unable to contribute any new elements to theories as it only attests those theories. Theoretically, this study adds more insight to the understanding of lecturers' OER use activities. The literature on OER assisted the study particularly as concerns university lecturers.

The study confirmed the relationship between professional training as a moderating variable on the independent constructs (intention, knowledge, social influence, facilitating conditions, perceived usefulness, trialability, and observability) of the Roger's diffusion of innovation

theory, activity theory, TRA, UTAUT and TAM. The foregoing study contribution can serve as a yardstick for future research.

### 6.6.2 Contribution to OER policy

Through the findings of the study, it is expected that policy makers at universities and government will assisted in the development and implementation of OER policies and guidelines. The study also adds to the current global OER movement considering that the establishment of OERs is central to the generation of knowledge. Furthermore, the study hopes to help guide current teaching and learning towards embracing OERs.

Policy makers, both universities and government, will be clearly guided on intellectual property issues regarding the use of OER in teaching and learning in order to motivate lecturers to participate in the development of their own OER materials. In addition, it is expected that the study will guide the reformulation of copyright legislation in the OER environment. The fears of ownership rights on the part of OER users and publishers will be allayed by the reformulation of copyright legislation.

### 6.6.3 Contribution to OER practice

Practically, the findings of the study provide more clarity on understanding the attitude and perception of lecturers' on the use of OER in teaching and learning. This study provides information on the factors that hinder the use of OER in teaching and learning. The study found that lecturers' low levels of OER understanding was the greatest hindrance to the use of OER in teaching and learning. The findings can assist universities to develop interventions that can stimulate the use of OER and improve OER-enabled higher education institutions. The study also contributes an OER instructional framework for the use of OER for universities and provides recommendations on overcoming the use of OER challenges in order to improve self-directed learning in South Africa. The university teaching and learning committees and management may use the findings to adjust themselves and the university regulatory processes on teaching and learning to the changes brought by the use of OER.

## 6.7 Recommendations for further research

This study has been significant in the sense that it provided a clearer perspective on how South African universities use OER in teaching and learning. The research findings revealed the use of OER as an effective tool to expose students to different educational resources suiting their learning styles and thereby leading to active participation in teaching and learning.

The following aspects are recommended for further study and research for the use of OER in teaching and learning:

- An investigation into the use of OER at private and public Technical, Vocational, Educational Training (TVET) colleges as well as private universities.
- Measurement of the impact of OER policies on teaching and learning at other South African universities that did not participate in this study.
- Determination of the impact of the commercial publishing houses on the OER movement.
- Exploration of the experiences of students on the use of OER in their teaching and learning.
- Investigation of the development of OER models to enhance teaching and learning practice.
- To investigate the impacts of copyright and licence issues at HIEs.
- To investigate the current teaching and learning policies of HEIs in South Africa with regard to integration of educational technologies in teaching and learning.
- To determine the use of OER in support of students learning to enrich student higher order thinking skills at the University of Technology in South Africa
- To research support mechanisms used to guide faculty members in the use of OER in teaching, learning and research.
- To investigate the collaborative use of OER with Learning Management Systems by HEIs.

### 6.8 Conclusion

This thesis was able to maximally deduct benefits from the adoption of both the qualitative research approach and quantitative methodology. The significant data which shed light on the research questions was as result of combined data collection methods. The findings indicated that lecturers are aware of OER but have little or no understanding of OER use.

The study indicated that there was a need to review teaching and learning policies in order to address issues related to OER copyrights and licences and publications. Moreover, the

development of teaching and learning policies should legislatively mandate OER training and education as well as related technology-enabled pedagogy. The study also revealed that universities need to have an OER unit. Lastly, it was evident that university management also needs to expedite OER awareness campaigns among its internal and external stakeholders, as this study showed that the OER awareness is low.

The next chapter contains an OER instructional framework designed and recommended for use by South African universities. The proposed framework is based on the literature review (cf. chapters 2 and 3) and the outcomes of the empirical research (cf. chapters 4 and 5) of this study.

# CHAPTER 7: THE OER ACCEPTANCE FRAMEWORK PROPOSED FOR THE USE OF OER IN TEACHING AND LEARNING AT SOUTH AFRICAN UNIVERSITIES

## 7.1 Introduction

The emerging global trend of sharing digital resources using technological devices without legal and financial limitations informed this study. Moreover, the continued use of copyrighted materials has impacted access to education in South Africa. The aim of the study was to explore the perspectives of lecturers in their use of OER in teaching and learning as another instructional for self-learning.

The study, in particular, contributed enlightenment on lecturers' views and the challenges they faced in their attempts to use OER successfully in teaching and learning. The study was also able to highlight the creativeness of some lecturers in attempting to use OER in teaching and learning without the support of their institutions.

## 7.2 Reflection on the insights

The findings from the study are to contribute towards the development of an OER Distribution framework that would empower lecturers to effectively implement the use of OER in their daily teaching and learning. The study initially examined the conceptualisation of OERs among participants. The findings revealed that although lecturers are aware of OERs and their benefits, their understanding and knowledge of OER was inadequate. In essence, lecturers have little or no understanding of the concept of OER. Neither do they have adequate knowledge to use OER in teaching and learning. The lecturers were found to be unable to draw from the benefits of OERs which, among others, include the 5Rs of Openness. These 5Rs are retain, reuse, revise, remix and redistribute. As a consequence, lecturers are unable to infuse the potential of OERs in teaching and learning. It can be concluded that the lecturers will not be able to provide teaching and learning with additional resources in order for their students to augment their studies. Furthermore, lecturers may be reluctant involve themselves with knowledge sharing with their peers as a result of their inadequate knowledge of open licensing. In general, the study revealed that the inadequate understanding of OER use in general has an effect on the use of OER in teaching and learning.

The second issue observed in this study concerned policies guiding the use of OERs in teaching and learning. The findings reveal that lecturers were not supported by policies in the pursuit to use OER in teaching and learning. In the face of the foregoing, the findings also reveal that the structure emanating from institutional policy support allowed participants the necessary platforms to explore OER. Even though it appears that universities like UNISA,

have a strategic plan for OERs, lecturers' reluctance to use OER in teaching and learning came from their inadequate understanding of the concept. This problem came along with their poor knowledge of OER identification on the net. Consequently, it is reasonable to argue that, with policy formulation advocating for the awareness, understanding and use of OER in teaching and learning, the benefits of OER will be visible in teaching and learning at South African universities.

The third issue relating to the use of OER examined in this study was the challenges faced by lecturers in the use of OERs. The findings reveal that lecturers' reluctance to use OER in teaching and learning was a result of challenges in using OER. The results show that there are three main challenges faced by lecturers in using OER in teaching and learning. The first one is that lecturers have little or no understanding of OER. There is need for policy-enabled professional interventions by the universities. Such interventions should aim to orientate lecturers on the OER concept. The second issue is the inadequate access to the internet and other technological tools. This has been shown to be a hindrance in lecturers' attempt to use OER in teaching and learning. The third issue is that lecturers are hindered in their attempt to use OER in teaching and learning due to inadequate education, training and awareness. Finally, the lack of awareness on license and copyrights on OER in particular were shown to also hinder the lecturers' use of OER in teaching and learning. Participants expressed the need for OER education, training and awareness. Furthermore, participants reported that they need training and clarity on copyrights and license issues particularly regarding their right to publication ownership.

The fourth observation relating to the use of OER examined in this study was the existence of models used by lecturers for OER implementation. The results show that there are no policy guidelines on OER models in particular. The results show that lecturers were unable to indicate any specific model they use. This means that lecturers use OER as additional resources in their teaching and learning practices. The findings also indicate that lecturers have developed their own strategies of integrating OER into the development of their courses, in order to assist students.

### 7.3 The OER distribution framework proposed for the use of OER at South African universities

The discussions of this study advocate for an OER Distribution framework to advance the use of the OER in teaching and learning. The Diffusion of Innovation (DOI) theory proposed by Rogers (2003) was chosen to support the findings of this study. In accordance to DOI, HEIs

are likely to decide to adopt OERs after going through Rogers' five stages of the adoption-decision process:

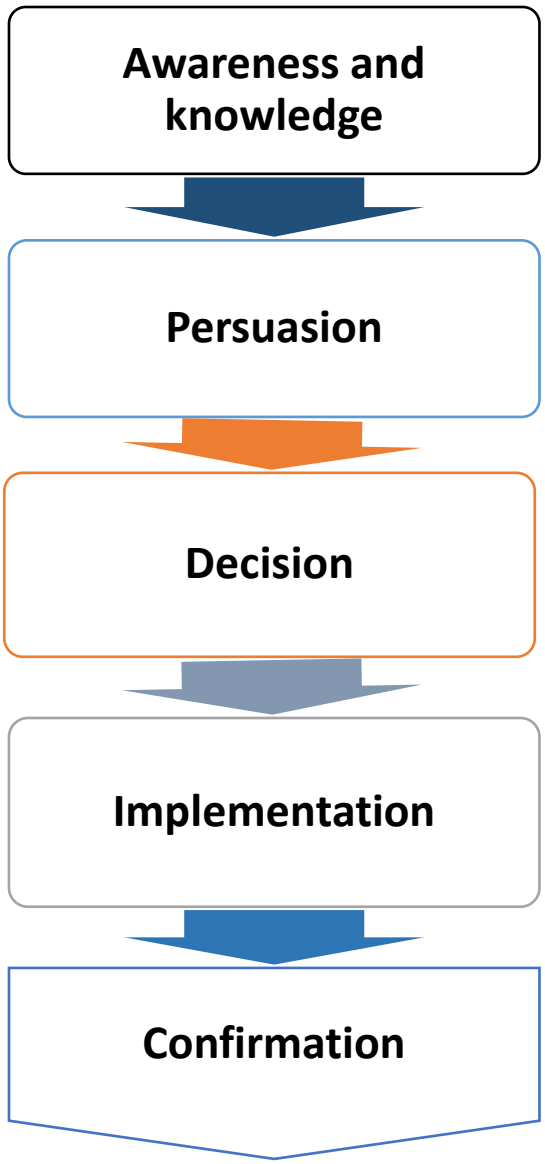


*Figure 7. 1: The five stages of the innovation adoption-decision process by Rogers (2003)*

The above figure 7.1 as developed by Rogers (2003) illustrates the five stages through which lecturers will usually have to go through before they actually use OER in teaching and learning. The *awareness and knowledge stage* is the first stage whereby lecturers realise the existence of OERs and embark on searching more knowledge on OERs. This stage is characterised by probing the existence of OERs. This scrutiny forms three kinds of knowledge which, according to Rogers (2003), are awareness-knowledge, how-to-knowledge, and principles-knowledge. In the Awareness-knowledge, the knowledge acquired by lecturers indicates the presence of OERs. The How-to-knowledge is when the knowledge acquired by lecturers contains information about how to effectively use OERs in teaching and learning. Principles-knowledge

is when the knowledge acquired by lecturers contains information about how to effectively apply OERs in teaching and learning for continued use of OERs.

The *Persuasion stage* is the second stage of adoption-decision process characterised by lecturers either having a negative or positive attitude toward OERs. Lecturers will be ready to use OER in teaching and learning after acquiring information on OERs. The *Decision stage* is when the lecturers are given provision to either adopt or reject the use of OER in teaching and learning. The *Implementation stage* is when the lecturers put use OER in teaching and learning. This stage maybe characterised by some elements of uncertainty from the lecturers if the results from using OERs in teaching and learning are problematic. The elements of uncertainty are then alleviated by the available technical assistance. The *Confirmation* stage is when the lecturers have made the innovation-decision, even though they may still need to be supported in continuing to keep to their decision. Lecturers are likely to reverse their decision on using OER in teaching and learning if they come into contact with contradictory results from OERs.

### 7.3.1 The Conceptual framework for the proposed OER Distribution framework

The basis for the conceptual framework is to identify key concepts, conceptualise the concepts and indicate their interrelationship (van der Waldt, 2020:2). The purpose of this study was to examine the use of OERs by lecturers at South African universities. The research questions designed to achieve the purpose of this study covered different facets of OER such as conceptualisation of OER, policies guiding the use of OER, challenges faced by lecturers in the use of OER and the existing framework used by lecturers for implementing OER in teaching and learning. In this study various challenges were considered and a blueprint to get better of them was suggested. In order to achieve the proposed OER Distribution framework, various general themes were considered in the examination of the findings and use of OER by participants. These themes form the conceptual framework that informs the development of the OER Distribution framework (Figure 7.2) emanating from the findings of this study.

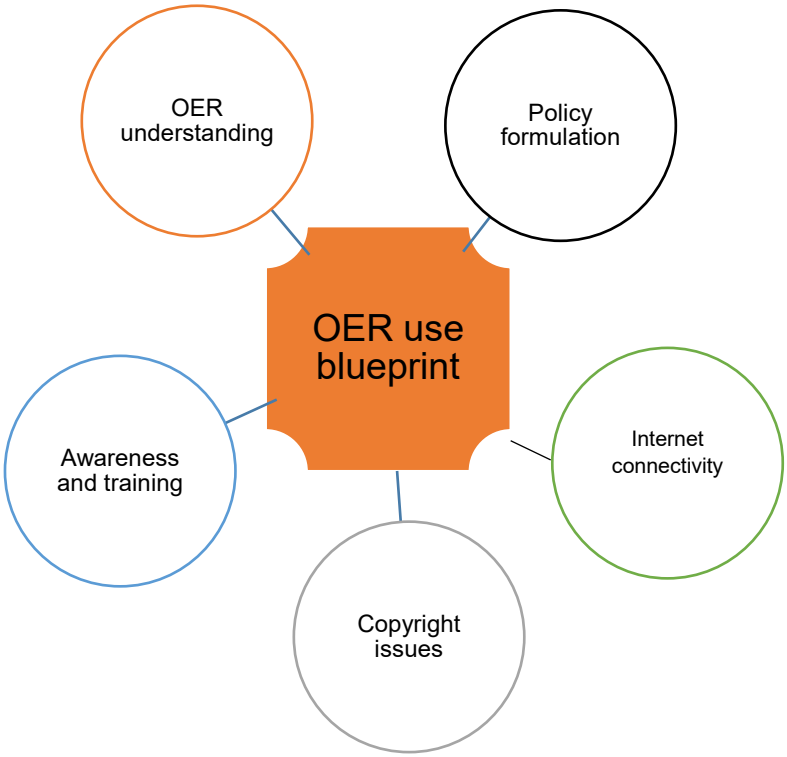


*Figure 7. 2: The conceptual framework for the proposed OER distribution framework*

The above Figure 7.2 represents the conceptual framework for the proposed OER Distribution framework. The proposed OER Distribution framework comprises policy formulation, OER understanding, copyright issues awareness, awareness and training, policy formulation and internet connectivity, which are discussed as follows:

#### 7.3.1.1 Internet connectivity

One of the most salient features of the 21st century is the Internet, the World Wide Web, and various digital technologies that are influencing the delivery of teaching and learning around the globe (McGreal, et al., 2013: 91). The swift expansion of the Internet globally and its potential to transform the delivery of education worldwide led to collaborations across borders where new ideas on teaching and learning are exchanged (Haythornthwaite, Andrews , Fransman & Meyers,2016:3). Internet connectivity is one of the biggest barriers for implementation of technology-enabled education because many developing countries have little or no internet connectivity. The definition of OERs often mentions their availability on the Internet. In the view of this study, internet connectivity refers to the ability of lecturers to easily use internet with high bandwidth in accessing and downloading freely available resources

under open licensing. The internet is an integral part of OER use in teaching and learning at universities. On the whole, it is mostly Open and Distance Learning institutions which seem to be putting more emphasis on easing access to technology for their lecturers. This study revealed a high level of unequal access to internet, which is a barrier to the use of OER in teaching and learning.

#### 7.3.1.2 Awareness and training

HEIs need to increase OER awareness and training, to avoid relying on traditional instructional approaches and advance to student-centred teaching and learning approaches. The increased OER awareness and training have the potential to reduce the demand in training and material acquisitions for the HEIs. This study revealed that lack of awareness and training on the OER concept is a hindrance to the embrace and use of OER by the institutions. This study also revealed that the participating institutions were characterised by low levels of awareness regarding the OER concept. In the view of this study, awareness creation and OER training refer to formal interventions aimed at familiarising lecturers with OER through workshops and orientations to enable the acceptance of OER in their teaching and learning.

#### 7.3.1.3 Copyright issues awareness

Lecturers need to be made aware of intellectual property laws applicable to the educational resources, particularly those that are openly available on the net. Butcher et al. (2015:8) indicated the paramount attribute of OERs as being accessible on the public domain under free licensing laws. Furthermore, they are convenient for assimilation into teaching and learning and can be used freely due to the Creative Commons licensing rules (Ibid). As a consequence, OERs have a distinctive feature comprising of the open copyright licence or Creative Commons (CC) permitting their resources to be placed in the public domain for ease of access and modification (Orr et al., 2015:15). In the context of this study, copyright issue awareness refers to the ability of lecturers to easily take advantage of flexible copyright licences such as CC to enrich their teaching and learning with the relevant OERs. Generally, there seems to be little or no effort, by the universities, to orientate lecturers on intellectual property laws. This study revealed that the lack of awareness on OER licenses, and copyrights in particular, was a hindrance to lecturers' use of OER in teaching and learning.

#### 7.3.1.4 OER understanding

For the purposes of this study, OER understanding refers to the ability of an individual to have knowledge of the concept of OER. This study revealed that participants were aware of the concept of OER but they did lack knowledge on its adoption and application. This study also

revealed that the institutions have not yet embarked on professional development around the concept of OER hence some participants were unable to conceptualise the concept. There is a need for sufficient training on OERs and their use in teaching and learning as a requirement for the widespread use of OER in teaching and learning. HEIs in South Africa are to put emphasis on extensive awareness programmes. These programmes should raise awareness on the use of OER in their faculties, in order to raise OER curiosity among faculty members.

#### 7.3.1.5 Policy formulation

An institutional policy should be tailored towards the transformation of the organised standards within an institution, in order to establish new standards. OER policy within a teaching and learning institution assists in the creation, development and maintenance of OERs. Policy formulation in this study refers to the process of designing and approving policy in order to achieve set policy objectives through its implementation. The study revealed a lack of OER policy within the institutions, which hindered the use of OER in teaching and learning. Even though only one institution has an OER strategy in place, this study could not differentiate the views of all participants as there were many inconsistent views around the use of OER. Participants were aware of the benefits to be derived from the use of OER but they did not have a clue on strategies to integrate OER in teaching and learning. The teaching and learning policies of the participating institutions didn't embrace the use of OER. There needs to be a mandate from the government obligating the institutions and guiding the adoption and implementation of OERs, particularly in teaching and learning.

### 7.3.2 The OER distribution framework proposed for the use of OER at South African universities

The purpose of the OER Distribution framework, Figure 7.3, is to establish an OER concept acceptance in teaching and learning at South African universities in order to alleviate the shortcomings identified by this study. The OER Distribution framework seeks to create a relationship between the research problem and the suggested solution of this study. The proposed OER Distribution framework aims at assisting universities to advance the effective use of OER in teaching and learning. The literature review discussed in chapter 2 and 3 as well the research findings discussed in chapter 4 and 5 provided the lens through which the OER Distribution framework can be viewed. The application of DOI in the study helped identify elements that underpin the usage of OER in teaching and learning.

The research problem, as outlined in Chapter one, highlights the need for university lecturers to have a clear common perspective on the OER concept in order to reduce relying on print

materials and increase OER use in their teaching. This study was able to reveal the limitations in the use of OER at South African universities, leading to suggestions on how to address these limitations.

#### 7.3.2.1 Proposed framework

Developing an OER distribution framework for the 5R principles of OERs to be central in lecturers' use of OERs in teaching and learning was the core of this study. To this end, the Rogers (2003) Diffusion of Innovation theory and the Siemens (2004) Connectivist learning theory as combined theoretical framework were used as suitable lenses for making reasonable verdicts in answering the primary research question of this study and to accurately show and explain the researcher's OER distribution framework, based on the data.

The lecturers of the three universities afforded insights from their perceptions on the use of OER in teaching and learning, allowing for accurate findings which played a major part in designing the OER distribution framework. The individual perceptions of lecturers created knowledge and understanding of a suitable framework to counteract the lecturers' reluctance to use OER in teaching and learning. Lecturer's voices from the collected data were used as building blocks for the proposed OER distribution framework to counteract the lecturers' reluctance to use OER in teaching and learning.

The research findings indicate that the use of OER in teaching and learning is currently hindered by complex challenges. These challenges include lack of OER understanding, lack of access to the internet and technological tools, inadequate education, training and awareness and lack of awareness on license and copyrights. The following OER distribution framework in figure 7.3 combines elements from the findings to propose this framework:

The proposed OER distribution framework for universities in figure 7.3 employs a decentralised approach to the OER use process. The decentralised approach was selected for this framework to enable OER use to saturate universities in South Africa and inform the vision and mission of the institutions. Consequently, an opportunity is created for faculty managers together with the faculties to use the knowledge and experience from their teaching and learning environment to influence the individual lecturer's OER use. The OER use processes at the universities needs faculty level collaboration. This OER distribution framework uses Rogers' theory to indicate the value OER use adds to the universities' teaching and learning. Rogers' theory was adapted to make it more suitable for OER use at South African universities. In this circumstance, lecturers are the main users of OER in the act of teaching and learning.

The proposed OER Distribution framework combines the themes to guide the use of OER among South African universities. The following section uses the suggestions generated in the literature review and chapter 5 to develop a framework that clarifies OER use by lecturers.

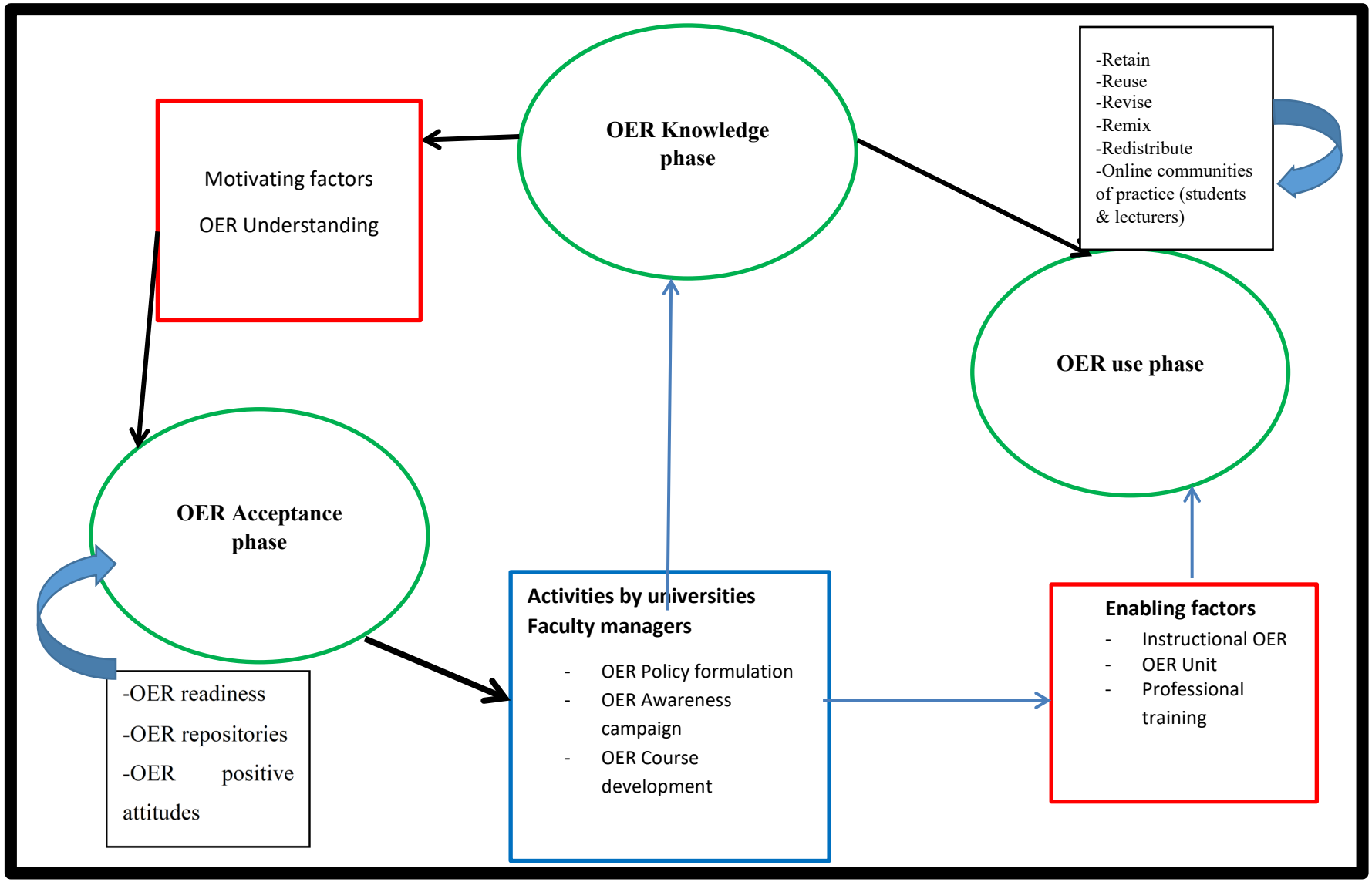


*Figure 7. 3 Proposed OER distribution model (Setshedi, 2022)*

#### 7.3.2.1.1 OER Knowledge phase

The OER Knowledge phase, just like that the one in Rogers' theory, is enabled by OER concept understanding and copyright law awareness. These make the universities eager to accept the use of OER. This suggests that OER knowledge depends on having effective awareness of OER which is signified by proper OER understanding and copyright law awareness.

The OER distribution framework for universities, unlike Rogers' theory, concentrates on the use of OER by the whole university. The OER Knowledge phase, just like Rogers' theory, has two stages which involve university faculty managers interacting with their faculties to initiate policy formulation processes, design OER awareness campaign models for the university and course development processes incorporating the use of OERs. The involvement of the faculties of the university to design the awareness programme models for the university has the potential to enable faculties display confidence and their ability to be conversant with OER search, creation and use.

The OER Knowledge phase enables universities to be conversant with OERs. Whilst most of the activities of the OER knowledge phase are put under the control of middle management, there is a strong support from the university senior management and the university council. Though policy formulation processes stipulating use of OER are also decentralised to the faculties, there is an effective leadership and monitoring from university senior management.

The research findings revealed OER awareness amongst the faculties but that awareness was found to be without OER understanding. According to Rogers (2003) users of innovation need to be involved at the knowledge stage. The little or no understanding of the OER concept revealed in this study came out as a strong hindrance to the OER use at South African universities.

OER awareness, which focuses on dispensing effective understanding of the OER concept, needs to be mediated by orientation workshops, continuous professional trainings and dialogues. The university population, particularly lecturers, need to be central in any OER activity initiation. Consequently, the saturation of awareness regarding OERs at the universities will subsequently enable lecturers to accept the use of OERs in their teaching and learning.

#### 7.3.2.1.2 OER acceptance phase

The OER acceptance phase in this context is used to express the stage the university puts plans in place to embrace the use of OER. There was no indication from the study findings that the participating universities have accepted the use of OER in their teaching and learning. It can be deducted from this study that challenges such as little or no understanding of OER, inadequate access to the internet and technological tools and inadequate education, training and awareness are the main barriers to the use of OER at South African universities. The universities' acceptance of OER use in teaching and learning will depend on its preparedness. The universities need to have policy-enacted OER activities including interventions and sound infrastructure such as to enable excellent internet connectivity.

One of the positive revelations of the study is the positive attitude displayed by the participants towards OER. The participants are aware of OERs and their potential in teaching and learning, which may be interpreted as their eagerness to use OERs. The OER acceptance phase can be likened to the persuasion stage in Rogers' model. The proposed OER distribution framework for universities suggests that policy formulation characterises the universities' positive attitude to OERs, seeing it as willingness to implement OER in teaching and learning. Activities like designing of awareness campaigns and OER infused course development at the faculty level are characteristic of universities ready to use OER in teaching and learning.

The OER acceptance phase of this framework also incorporates the decision stage of Rogers' model. It is characterised by the chance for universities to either accept or reject the use of OER in teaching and learning. The acceptance or rejection of the use of OERs in teaching and learning will depend on knowledge and understanding on the use of OERs by the universities. The awareness on copyright issue related to the OERs and the awareness campaigns will inform the policy formulation process at faculty level. Policy formulation will assist the universities make decisions more efficiently. According to the OER Distribution framework for universities, faculties focused on teaching and learning will be part of the initial policy formulation process thereby creating confidence in them and giving them a sense of ownership.

It can be inferred from the study that OERs emphasize resource sharing. The OER distribution framework for universities is also of the opinion that the policy formulation process should take a decentralised approach. It agrees with the decision stage of Rogers' model which underlines the significance of relationships between the creators, users and management. The decentralised approach employed in the OER distribution framework aims to overcome the

bureaucratic barriers on stakeholder's interpersonal relationships for the smooth acceptance of OER use at universities.

#### 7.3.2.1.3 OER use phase

The research findings indicated that there is little use of OER at South African universities. The participating universities in the study were unable to indicate either OER creation or OER use. This OER use phase includes implementation of OER, signifying OER creation and use by universities. It was revealed that universities teaching and learning have not yet embraced OERs.

It can be deducted from the study that there is a need for university teaching and learning policies to be adapted to include the use of OERs in teaching and learning. The study revealed that only one, out of the three participating universities, has made some attempts to use OERs in teaching and learning. The findings indicate the need for policy regulated guidance on the use of OER in teaching and learning.

The OER Distribution framework for universities proposes that the OER use phase, just like in the implementation and confirmation stage of Roger's model, is characterised by the creation of OERs guided by Wiley's 5R activities. Wiley's 5R activities are retain, reuse, revise, remix and redistribute. The universities in this phase have made a decision to accept OERs and are enabled to use them in teaching and learning and have established online communities of practice in place. The learning and knowledge in the online communities of practice is distributed in both lecturers/students and digital tools as guided by connectivism learning theory.

The OER Distribution framework proposes policy formulation in the OER acceptance phase, which through initiatives like policy formulation on the use of OER, ensures OER enabling factors like instructional OER, OER units and professional training. Activities by faculty modulate the OER use phase through enabling factors which include instructional OER, the creation of OER units and the provision of professional training. The outcome of the OER use phase is also influenced by the level of knowledge acquired in the knowledge phase.

## 7.4 Conclusion

This study is an attempt to contribute a solution to the rising demand for education. The review of literature in Chapter two and three indicated that teaching and learning at South African universities still need to take advantage of OERs. The recent outbreak of Covid-19 also caused a paradigm shift in university perceptions of their teaching and learning offer. OER-

enabled pedagogy can enable universities to continue with teaching and learning even in disruptive Covid-19 conditions. The use of OERs provides that needed self-regulated teaching and learning approach as an option to current teaching and learning approaches at South African universities.

The suggested OER distribution framework for universities, as a strategy for effective use of OER in teaching and learning in this chapter, provides guidance for the enhancement of our university education system. The use of OER in teaching and learning at South African universities has the potential to effectively transform the university education sector. This particular study of OER use at South African universities is the initial step that will set the wheel in motion for the university education sector to join the OER movement.

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# APPENDICES

## APPENDIX A: UNISA ETHICAL CLEARANCE

UNISA university of south africa

## UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2019/06/12

Ref: **2019/06/12/55362443/22/MC**
Name: Mr J Setshedi
Student: 55362443

Dear Mr Setshedi

**Decision:** Ethics Approval from 2019/06/12 to 2024/06/12

**Researcher(s):** Name: Mr J Setshedi
E-mail address: justinusetshedi@webmail.co.za
Telephone: +27 74 740 2551

**Supervisor(s):** Name: Prof MM van Wyk
E-mail address: vwykmm@unisa.ac.za
Telephone: +27 12 429 4775

**Title of research:**

**Academics reuse and adaptation of open education resources at teacher education colleges: a case of selective South African Universities.**

**Qualification:** PhD in Curriculum and Instructional Studies

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2019/06/12 to 2024/06/12.

*The **medium risk** application was reviewed by the Ethics Review Committee on 2019/06/12 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No field work activities may continue after the expiry date **2024/06/12**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

*Note:*

*The reference number* **2019/06/12/55362443/21/MC** *should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,

**Prof AT Motlhabane**
**CHAIRPERSON: CEDU RERC**
motlhat@unisa.ac.za

**Prof PM Sebate**
**ACTING EXECUTIVE DEAN**
Sebatpm@unisa.ac.za



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## APPENDIX B: UNISA RPSC

UNISA university of south africa

**RESEARCH PERMISSION SUB-COMMITTEE (RPSC) OF THE SENATE RESEARCH, INNOVATION, POSTGRADUATE DEGREES AND COMMERCIALISATION COMMITTEE (SRIPCC)**

12 September 2019

**Decision: Research Permission Approval from 12 September 2019 until 28 February 2020.**

Ref #: 2019_RPSC_043
Mr. Justinus Setshedi
Student #: 55362443
Staff #: N/A

**Principal Investigator:**
**Mr. Justinus Setshedi**
Department of Curriculum and Instructional Studies
School of Teacher Education
College of Education
Setshedi.j@dhet.gov.za, 012 312 5327, 0747402551

Supervisor: Prof Michael van Wyk, vwykmm@unisa.ac.za; 012 429 6201

**Academics' reuse and adaptation of open education resources at teacher education colleges: a case of selective South African universities**

Your application regarding permission to conduct research involving UNISA employees, students and data in respect of the above study has been received and was considered by the Research Permission Subcommittee (RPSC) of the UNISA Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (SRIPCC) on 29 August 2019.

It is my pleasure to inform you that permission has been granted for your study. You may:

1. Gain access to the work email addresses of the academic employees from the College of Education, through the gatekeeping assistance of your supervisor.
2. Conduct face-to-face interviews with 9 academic employees from the College of Education who teach modules involving Open Education Resources (OER), who agree to participate in the study voluntarily.
3. Gain access to the Unisa Open Education Resources Policy for the purpose of using it for analysis in his research study.

You are requested to submit a report of the study to the Research Permission Subcommittee (RPSC@unisa.ac.za) within 12 months of completion of the study.

The personal information made available to the researcher(s)/gatekeeper(s) will only be used for the advancement of this research project as indicated and for the purpose as described in this permission letter. The researcher(s)/gatekeeper(s) must take all appropriate precautionary measures to protect the personal information given to him/her/them in good faith and it must not be passed on to third parties. The dissemination of research instruments through the use of electronic mail should strictly be through blind copying, so as to protect the participants' right of privacy. The researcher hereby indemnifies UNISA from any claim or action arising from or due to the researcher's breach of his/her information protection obligations.

*Note:*
*The reference number **2019_RPSC_043** should be clearly indicated on all forms of communication with the intended research participants and the Research Permission Subcommittee.*

We would like to wish you well in your research undertaking.

Kind regards,

**pp. Dr Retha Visagie – Deputy Chairperson: RPSC**
Email: visagrg@unisa.ac.za, Tel: (012) 429-2478

**Prof L. Labuschagne – Chairperson: RPSC**
Email: llabus@unisa.ac.za, Tel: (012) 429-6368

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## APPENDIX C : LETTER OF CLEARANCE FROM UMP

UNIVERSITY OF MPUMALANGA

Creating opportunities

**Private Bag X11283, Mbombela, 1200**
**Cnr R40 White River Road & D725, 013 002 0001, www.ump.ac.za**

29 August, 2019

LETTER OF CLEARANCE FROM UNIVERSITY OF MPUMALANGA RESEARCH DIRECTORATE

This letter is to confirm that the Doctoral student Justinus Setshedi, studying at UNISA, is granted permission to conduct a research titled:

**Academics reuse and adaptation of open educational resources at teacher education colleges: a case of selective South African universities**

I hereby confirm that I am aware the study involves:-

- interviewing Staff of UMP.

Mr Setshedi is granted permission to carry out this study under the following conditions.

1. **Sensitive information be shared with UMP Management**
2. **Ethical principles be upheld**

Yours faithfully,

Prof Phindile Lukhele- Olorunju
Director Research Management

## APPENDIX D: TUT GATEKEEPER PERMISSION

Tshwane University of Technology
*We empower people*

Research Ethics Committee

*The TUT Research Ethics Committee is a registered Institutional Review Board (IRB 00005968) with the US Office for Human Research Protections (IORG# 0004997) (Expires 14 Jan 2020). Also, it has Federal Wide Assurance for the Protection of Human Subjects for International Institutions (FWA 00011501). In South Africa it is registered with the National Health Research Ethics Council (REC-160509-21).*

October 5, 2020

Ref #: REC/2019/09/004
Name: Setshedi JR
Student #: 55362443, UNISA

Mr JR Setshedi
C/o Prof MM Van Wyk
College of Education
University of South Africa

Dear Mr Setshedi,

**Decision: Gatekeeper Permission - Final Approval**

---

**Name**: Setshedi JR
**Project title**: *Academics reuse and adaptation of open educational resources at teacher education colleges: a case of selective South African universities*
**Qualification**: PhD in Education, University of South Africa.
**Supervisor:** Prof MM Van Wyk

---

Thank you for submitting the revised project documents for ethics clearance by the Research Ethics Committee (REC), Tshwane University of Technology (TUT). In reviewing the documents, the comments and notes below are tabled for your consideration, attention and/or notification:

- **Proposal**

  - **Population.** The revised position structure in the online survey to include 'senior lecturer' is in order and duly noted.

- **Questionnaire**

  - **Biographical Information, Gender and Age.** The justification for the inclusion of biographical items enquiring about the respondents' gender and age is in order and duly noted

- **Memo of Revisions**

  - Memo that outlines the clarifications and/or revised documents in which each of the required revisions are indicated together with the action/s taken to address is in order and duly noted.

- **National Lockdown and COVID-19 guidelines**

  - Please take note of and adhere to the guidelines stipulated in the document included with the feedback letter entitled, "Implications of alert levels for researchers and postgraduate students during the COVID-19 pandemic."

The Chairperson of the Research Ethics Committee, Tshwane University of Technology, reviewed the revised project documents on October 1, 2020. **Final Approval** is granted to the study.

The proposed research project may now continue with the proviso that:

1) The researcher/s will conduct the study according to the procedures and methods indicated in the **approved proposal**, particularly in terms of any undertakings and/or assurances made regarding the confidentiality of the collected data.
2) The proposal will be submitted to the Committee for prospective ethical clearance if there are any substantial **deviations** and/or changes from the approved proposal.
3) The researcher/s will act within the parameters of any applicable **national legislation, professional codes of conduct**, institutional guidelines and scientific standards relevant to the specific field of study. Strict adherence to the following South African legislation, where applicable, is especially important: Protection of Personal Information Act (Act 4 of 2013), Children's Act (Act 38 of 2005) and the National Health Act (Act 61 of 2003).
4) The researcher will inform the REC as soon as possible of any **adverse events** involving research participants that may have occurred during the course of the study. It includes the actions and/or processes that were implemented to mitigate and/or prevent any further injuries and/or adverse outcomes.
5) The researcher will inform the REC of any **new or unexpected ethical issues** that may have emerged during the course of the study, as well as how these ethical issues were addressed. The researcher must consult with the REC for advice and/or guidance in any such event.
6) The current ethics approval expiry date for this project is **September 30, 2022**. No research activities may continue after the ethics approval expiry date. An application for the extension of ethics approval must be submitted for projects that need to continue beyond the expiry date.

*Note:*
*The reference number [top right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants.*

Yours sincerely,

H Mason (Dr)
Chairperson: Research Ethics Committee
[TUTRef#2019=09=004=SetshediJR]

**APPENDIX E: CONSENT FORM FOR RESEARCH PARTICIPANTS**

## CONSENT FORM

I _____hereby agree to participate in this PhD in education project which focuses on the academics' reuse and adaptation of open educational resources at teacher education colleges: a case of selected South African universities.

The main purpose of the study, terms and conditions has been explained to me. I understand that should I feel like discontinuing with my participation in this semi-structured interview I can terminate at any time. Although the semi-structured interview will be tape recorded, my responses will remain confidential, anonymous and no names will be mentioned in the report.

I understand the outcomes of this research project, which purpose is not necessarily to benefit me personal. I understand that my details as they appear in this consent form will not be linked to the interview schedule and that my answers will remain confidential.

I understand this information and agree to participate fully under the conditions stated above:

Signed: _____

Date: _____

## APPENDIX F: SEMI-STRUCTURED INTERVIEW QUESSTIONNARE

**F2F interview schedule attached as Appendix*:* C**

**SEMI-STRUCTURED SCHEDULE**

Introduction to the session

The researcher start off by reiterating the purpose of the meeting. He will start by saying the following:

**I'm very grateful to you all for sparing time to talk about your dissemination and citation behaviour. The purpose of this focus group is to establish a base of evidence on the academic teaching staff's use/re-use and adaptation of OER in their teaching, which will help to inform the future development of OER Instructional framework. There are no right or wrong opinions, I would like you to feel comfortable saying what you really think and how you really feel.**

A POLICIES ON OER USE

What are the status of specific policies and models guiding the teacher education faculties/ colleges?

Is your institutional policies supporting the adaptation of OER?

What do you think are the OER initiatives in your institution that encourages the development and adaptation of teaching and learning materials?

Are there OER support services in your institution to develop courses?

Are the OER initiatives in your institution enabling all free access to educational material?

B. CONCEPTUALISATION OF OER USE BY LECTURERS

What is your understanding of OER?

Are you using OER in your teaching?

What OER are using in your teaching

Do you feel that there is a need to increase your use of OER in your teaching?

What types of OER have you created?

C. CHALLENGES FACED BY LECTURERS IN OER USE

What are the barriers that hampers your reuse and adaptation of OER in your teaching?

What are those factors that you think will motivate you to increase your OER creation.

In what ways do you feel your OER creation is influencing your course development?

EXISTING MODELS OF OER USE

What are the existing models are you implementing for re-use and adaptation of OER in your teaching.

What is your view regarding the existing models in your institutions.

## APPENDIX G: INTERVIEW PROTOCOL FOR LECTURERS

## APPENDIX K

## INTERVIEW PROTOCOL FOR LECTURERS

**Project:** Lecturer's use of open educational resources (OER) at selected South African Universities

**Time of interview**: 14:30

**Place**: University A, University B and University C

**Duration**: 30 minutes

**Interviewer**: Setshedi J.R

| Interviewee | University | Designate |
|---|---|---|
| Lecturer A | University A | |
| Lecturer B | University A | |
| Lecturer C | University A | |
| Lecturer D | University A | |
| Lecturer E | University A | |
| Lecturer F | University A | |
| Lecturer G | University A | |
| Lecturer H | University A | |
| Lecturer I | University B | |

| | | |
|---|---|---|
| Lecturer J | University B | |
| Lecturer K | University B | |
| Lecturer L | University B | |
| Lecturer M | University B | |
| Lecturer N | University B | |
| Lecturer O | University B | |
| Lecturer P | University B | |
| Lecturer Q | University B | |
| Lecturer R | University C | |
| Lecturer S | University C | |
| Lecturer T | University C | |
| Lecturer U | University C | |
| Lecturer V | University C | |
| Lecturer W | University C | |

Description of the project, telling the interviewees about:

(a) The purpose of this study is to identify and design components that should be included in an instructional framework for the reuse and adaptation of open educational resources at teacher education colleges

(b) My aim is to interview lecturers at schools/colleges of education

(c) Pseudonyms will be used to protect your confidentiality.

(d) The interview will last for 30 minutes

(e) Ask the interviewee to read and sign the consent form.

(f) Turn on the recorder and test it.

**Questions:**

**1. What are the status of specific policies and models guiding the teacher education faculties/ colleges?**

**1.1 Lecturer A:** I may be specific to say there is a policy. What I know is that any form of instruction has to be guided by a researched materials. So we surf on the internet and use printed materials. I don't know of any specific policy on OER.

**1.2 Lecturer B:** We don't have a policy in terms of OER. I know OER from UNISA. We were using this after being workshopped by TESSA that there are OERs that can be used especially because it was an open distance university. I tried to show students how to use those OERs, especially this side where we don't have teaching aids and in most cases where students have to go for Teaching Practice. They had to develop their own teaching aids. It is not something that we are using on daily basis

**1.3 Lecturer C:** I am not aware of any workshop. In my three years of stay at the university, I have never attended any OER workshop, unless in other workshops where they mentioned OER.

**1.4 Lecturer D:** I have never seen any policy on OER. The only thing is Moodle that was brought in, a terrible mode of Moodle.

**1.5 Lecturer E:** I don't remember having such policies

**1.6 Lecturer F:** I have never seen any policy

**1.7 Lecturer G:** To tell the truth, there is no policy in our college specifically UNISA has a strategy. In terms of having a policy in our own college that one I have not seen.

**1.8 Lecturer H:** I am not sure about models and policies. The College of Education has put in place that all new programmes that are going to be offered should be approved by the College of Education Teaching and Learning Committee approval as well as all study material

that you want to use. By so doing, they want to ensure that all materials are inclusive of OER. I haven't seen any OER policy. There is a guiding policy on OER.

**1.9 Lecturer I:** I don't understand but I know that there is a document guiding OER. It explains what OER is.

**1.10 Lecturer J:** Yes, there are policies. Teaching and learning.

**1.11 Lecturer K:** I will say that we do have existing policies, however implementation is a problem. Policy writers don't filter information such that it is known. The implementation of teaching and learning policies do encompass the concept of OER but not in more adequate way.

**1.12 Lecturer L:** UNISA has a document called OER Strategy. Maybe I can refer your one of my colleague who is charge. There is a policy that speaks to OER. Basically OER strategy looks into what are OERs, how are OERs understood, how are OERS developed, what is the role of licensing, how we circumvent the licensing, blockages that licensing impose. I think the library some three years ago has been working on the repository. The library had to negotiate licensing with publishing houses.

**1.13 Lecturer M:** Community engagement is one of the pillars at university. I know there is one-Teaching and Learning policy.

**1.14 Lecturer N:** I am not the right person to talk about OER policy. There are modules into which OER is integrated. Mine is not one of them. Certainly, there are no policies.

**1.15 Lecturer O:** Open Distance Learning is the whole idea of openness. We are encouraged to use OER.

**1.16 Lecturer P:** We are from this background of teachers. Basically we teach our students how to teach learners. Our teaching and learning is guided by the CAPS policy. CAPS policy is a foundation of teacher education programmes.

**1.17 Lecturer Q:** With regard to teaching and learning, there are several policies like attendance policy which guides students in class attendance. The other policies that we use is Copyright policy, for instance, we either prescribe textbooks for students or compile study notes for students in an attempt to comply with the policy.

**1.18 Lecturer R: The only policy I am aware about is the one on** plagiarism.

**1.19 Lecturer S:** To be honest with you, t is my first time to hear about OER.

**1.20 Lecturer T:** In terms of policies, there are a number of guidelines for example, if we are using material on the basis of open access, we have the TUT blackboard called MyTutor. Lecturers prepare study guides and other prescribed activities. We also recommend to use other digital sources of information like Wikipedia that is a knowledge construction site. We discourage students to depend on Wikipedia because it is a construction site. I haven't seen any OER policy at this institution.

**1.21 Lecturer U:** Yes, we have policies that guide us on how to teach, how to assess. However, there is no policy on OER.

**1.22 Lecturer V:** I am not 100% sure. I follow the guidelines that I get from the study guides. I know what is expected of us but have read the guidelines on teaching and learning.

**1.23 Lecturer W:** There are various policies including the one for teaching and learning.

**1.1 Is your institutional policies supporting the adaptation of OER?**

**1.1.1 Lecturer A:** There is Moodle where there are resources. It is a programme where you can upload materials that you can be used for teaching. When you receive information from other organisations you can upload them.

**1.1.2 Lecturer B:** There is no policy supporting the adaptation of OER.

**1.1.3 Lecturer C:** If there are, that should be through the library I suppose.

**1.1.4 Lecturer D:** I am not aware of policies supporting the adaptation of OER.

**1.1.5 Lecturer E:** Not necessarily that they don't support. Remember our university is still a new university and there is a move towards formulating policies in support of OER.

**1.1.6 Lecturer F:** There is especially when I deal with the in-service teachers on methodology.

**1.1.7** Lecturer G: The strategy was signed in order to ensure that OER are accessible to employees and clients.

**1.1.8 Lecturer H:** There are no policies supporting the adaptation of OER. However, am using OER in the content of the module. OER that I use to supplement the content in the textbook.

**1.1.9 Lecturer I:** I believe our teaching and learning policy supports the adaptation of OER?

**1.1.10 Lecturer J:** There is evidence in the Teaching Practice modules that students are supposed to download and use OER lesson plans as examples and adapt and adopt them.

**1.1.11 Lecturer K:** UNISA is an ODEL institution. OER are suitable to use.

**1.1.12 Lecturer L:** I think the strategy is the key starting point. If you want to start something you need to have a strategic approach. The initiatives started with the library to create a repository where the library was to negotiate licenses. It is a way through to open the material. UNISA has just started the Chair of Commonwealth of Learning.

**1.1.13 Lecturer M:** In our Information Technology system we have MyTutor, like supporting online research, teaching and all these things like giving assignment can be on MyTutor. As lecturers we have access to an open software where we can get information.

**1.1.14 Lecturer N:** I assume there are supporting policies but I haven't used or read them. I heard from people that there are such initiatives.

**1.1.15 Lecturer O:** We are encouraged to use, adapt and reuse OER in our policies. However, I have not yet seen any OER policy.

**1.1.16 Lecturer P:** Sometimes when we want to refer in class what is happening at high school, you will find a disc attached to a textbook. We don't rely on textbooks. We also use extra information from other universities.

**1.1.17 Lecturer Q:** I just mentioned a Copyright policy because they really want university staff not to be caught in issues of plagiarism and stuff. It does support because it guide staff on how to use the internet information in a right way

**1.1.18 Lecturer R:** We sometimes supplement the information in the textbooks, by adapting what we get from the internet. However, we have to acknowledge that.

**1.1.19 Lecturer S:** I haven't seen any policy. A prospectus is a book link. To my own understanding the prospectus serves as policy.

**1.1.20 Lecturer T:** The University has a Copyright Act which indicates that when you take sources you must acknowledge. Copyright Act is supporting OER.

**1.1.21 Lecturer U:** I am not sure about OER.

**1.1.22 Lecturer V**: OER is actually new to me but it sounds as something that I can use. It is something that is new.

**1.1.23 Lecturer W:** These policies are supporting OER.

**1.2: Which OER initiatives in your institution encourage the development and adaptation of teaching and learning materials?**

**1.2.1 Lecturer A:** There is Moodle.

**1.2.2 Lecturer B:** We encourage students to use OER. Information Technology is a must for students.

**1.2.3 Lecturer C:** There are no OER initiatives.

**1.2.4 Lecturer D:** At our institution, they only preach about OER and they don't do it.

**1.2.5 Lecturer E:** We have access to internet and library.

**1.2.6 Lecturer F:** I am not sure about OER initiatives.

**1.2.7 Lecturer G:** I cannot say we have OER at our institution. We are using materials like e-books. The only challenge is the licensing of these materials is with regard to the issue of licensing. When you hear about OER, you are told they open and freely accessible.

**1.2.8 Lecturer H:** Well, I do not apply any initiatives at the moment.

**1.2.9 Lecturer I:** Wow, OER! , What are the initiatives? I don't know about initiatives. I have no interest in OER but I have interest in open learning

**1.2.10 Lecturer J:** I am using OER in the Teaching Practice modules. We are developing materials and other materials has just been finalised for the new upcoming programmes. We have make use of OER and referrals as much as we can.

**1.2.11 Lecturer K:** There is a tool called MyUnisa that is being used. Every student is expected to use it. There is Department level staff who are specifically responsible for OER services.

**1.2.12 Lecturer L:** There is a centre for Teaching and Learning. It is at a strategic level of developing policies.

**1.2.13 Lecturer M:** Not sure about the initiatives.

**1.2.14 Lecturer N:** In terms of initiatives there are models that are identified. There is training and workshops around that but I wasn't part of that. There are key people I know who are initiating OER.

**1.2.15 Lecturer O:** The library is geared towards supporting OER initiatives.

**1.2.16 Lecturer P:** As an institution we rely mostly on the library for OER use related services.

**1.2.17 Lecturer Q:** At the moment we don't have OER initiatives. No, we don't have such. We have MyTutor which is more institutional and it is like a blackboard.

**1.2.18 Lecturer R:** No, I am not familiar with OER initiatives.

**1.2.19 Lecturer S:** We have what we call MyTutor where we deposit our material and communicate with students.

**1.2.20 Lecturer T:** I am not sure on that.

**1.2.21 Lecturer U:** No, I am not sure on OER initiatives.

**1.2.22 Lecturer V:** I don't know of any OER initiatives.

**1.2.23 Lecturer W:** I follow Siyavula Opentextbooks. Yes, I have a project that I do with my students of writing a textbook using Siyavula Opentextbook.

**1.3: What OER support services are available to develop OER courses?**

**1.3.1 Lecturer A:** I believe if we take it from that direction that our institution work with the Moodle.

**1.3.2 Lecturer B:** Currently there are no support services towards initiating OER.

**1.3.3 Lecturer C:** Not intentional, I just use my own access or through colleagues.

**1.3.4 Lecturer D:** They had people coming elsewhere but they are not good on Moodle

**1.3.5 Lecturer E:** We just receive resources from the library for our course development.

**1.3.6 Lecturer F:** I am not sure if you regard the availability of the internet as a support for OER.

**1.3.7 Lecturer G:** At UNISA there will be no tie when somebody will tell you that there is a workshop or this particular thing. It may have happened that there was a workshop.

**1.3.8 Lecturer H:** There is no support for OER. I will appreciate if we are made aware on how to evaluate an OER. We struggle with OER.

**1.3.9 Lecturer I:** There are O**ER support services like the library**

**1.3.10 Lecturer J:** There are services to develop OER courses. We are being supported by the Department of Teaching and Learning Unit especially as someone is attending writing retreats.

**1.3.11 Lecturer K:** There is support for OER.

**1.3.12 Lecturer L:** OER Strategy is an initiative enabling free access to educational material. Strategy is a document that maps out the way forward. The strategic document is here and our institution has to use it to develop policies.

**1.3.13 Lecturer M:** There are support services to develop OER. They assist lecturers with teaching and learning strategies.

**1.3.14 Lecturer N:** I was once provided with a lot of links. The library referred me to a lot of resources.

**1.3.15 Lecturer O:** The Centre for Professional Development runs courses to develop OER courses.

**1.3.16 Lecturer P:** The library staff has a policy. I haven't seen any OER policy at this institution.

**1.3.17 Lecturer Q:** We do have e-learning offices for support if we want to post online related issues for both students and staff.

**1.3.18 Lecturer R:** There are no OER support services.

**1.3.19 Lecturer S:** I am not sure about any support services related to OER.

**1.3.20 Lecturer T:** The ones that I can mention are paid by the University for us to access other materials.

**1.3.21 Lecturer U:** There was no workshop or awareness conducted on OER.

**1.3.22 Lecturer V:** There are no OER support services.

**1.3.23 Lecturer W:** We don't have support services for OER.

**1.4: How are OER initiatives enabling free access to educational material at your institution?**

**1.4.1 Lecturer A:** Moodle is an initiative because we can upload whatever we have sourced that we may use for teaching. It makes it easy to access the internet.

**1.4.2 Lecturer B:** We have laboratories where students create materials for schools. We have schools which we work with so that they can have OER from us.

**1.4.3 Lecturer C:** I haven't seen any. I am little bit aware of Creative Commons.

**1.4.4 Lecturer D:** There are but they don't always use it.

**1.4.5 Lecturer E:**I am not aware of any OER initiatives

**1.4.6 Lecturer F:** I know there are talks about incorporation of Information Technologies into courses. I assume there are initiatives that are coming our way.

**1.4.7 Lecturer G:** In the college, specifically, there is none. But at UNISA library is of good assisting to free access to educational material

**1.4.8 Lecturer H:** I am not sure there are initiatives.

**1.4.9 Lecturer I:** I am not aware of any initiative.

**1.4.10 Lecturer J:** They enable free access to educational material through OER Africa you can self- download

**1.4.11 Lecturer K: The OER initiatives enabling free access to open textbooks**

**1.4.12 Lecturer L:** The digital library at UNISA serves as an OER but it is only limited to UNISA.

**1.4.13 Lecturer M:** I am not sure about the initiatives.

**1.4.14 Lecturer N:** OER allows me to access free materials.

**1.4.15 Lecturer O:** UNISA has a database that we regularly use. The challenge is finding OER that you can use.

**1.4.16 Lecturer P:** Are OER relevant? Sometimes they are not accredited.

**1.4.17 Lecturer Q:** I am not sure about any OER initiatives.

**1.4.18 Lecturer R:** I am not sure about OER initiatives.

**1.4.19 Lecturer S:** I am no sure about OER initiatives. I haven't seen anything concerning OER.

**1.4.20 Lecturer T:** I am not sure about initiatives.

**1.4.21 Lecturer U:** I am not sure about any initiatives.

**1.4.22 Lecturer V:** I am not sure about OER initiatives.

**1.4.23 Lecturer W:** They allow material freely accessible

**2: What is your understanding of OER?**

**2.1 Lecturer A:** I believe it has to do with especially online that can be accessed on the internet.

**2.2 Lecturer B:** These are the resources that can be accessed by each and everyone who has an access to the internet. They are very useful. They make classes to be educational to learners.

**2.3 Lecturer C:** It is about resources that you can get from the internet and use, you don't pay for them. You are supposed to get or request for permission. I can put them on the study guide.

**2.4 Lecturer D:** It is the resources that are available on the internet for the use of any body. You can use it in your course, you don't have to pay. It is extremely useful.

**2.5 Lecturer E:** Like you are presenting to me. It is something new.

**2.6 Lecturer F:** It is when I can be able to enhance my teaching using resources that I get from the internet and be able to reflect and check up on the new trends happening on the educational system.

**2.7 Lecturer G:** OER are materials that should be open, accessible, be re-used, repurposed to whatever context. My wish is that the issue of licensing must be communicated openly and it should be relaxed. If I create a material need to acknowledge it.

**2.8 Lecturer H:** It should be freely available to students and for free. So that they don't have to necessarily pay for it. Of course, for the lecturers and as part of our work it is to publish.

**2.9 Lecturer I:** It is all the material that you can access freely online to teach and learn. It has to do with open learning resources.

**2.10 Lecturer J:** In my case, my understanding of it is open educational resources whereby teacher educators have free access to lesson plans, how to teach in different contexts-rural and peri-urban or any other thing. They are very useful for development of lesson plans.

**2.11 Lecturer K:** My understanding of OER is that there has to be resources that we can easily download, and affiliate to systems that we use in the university.

**2.12 Lecturer L:** OERs are educational materials that are made open and accessible to anyone. We need information to be easily accessible. It is based on the recognition that the world is riddled with massive socio-economic inequalities. If that's the scenario, the United Nations as the global body is driving the agenda. It is important that the resources are made available to the poorest of the poor.

**2.13 Lecturer M:** OER is a system that will assist a tutor to access teaching and learning material from the net.

**2.14 Lecturer N:** It is material regulated by the Creative Commons licensing and there are different categories that could be freely used.

**2.15 Lecturer O:** OER is openness. Knowledge is open and accessible.

**2.16 Lecturer P:** Open Educational Resources are resources that you get for free on the net.

**2.17 Lecturer Q:** My understanding of OER is an institution whereby the information is open for everyone in the community to access, like for an example postgraduate students can access articles that are related to their studies.

**2.18 Lecturer R:** OER whatever. I believe that as a university of technology we can have access to e-books and e-learning.

**2.19 Lecturer S:** OER is when education is open to anyone and there is no monopoly of education. Students must be able to read what researchers are doing.

**2.20 Lecturer T:** My understanding is very broad. It tells me of globalisation and participation on construction of knowledge, and digital development. It only becomes open educational resource because it works with digital, where we access document via the internet. It helps to access all sorts of information from all over the world.

**2.21 Lecturer U:** OER is an online multimedia reporting. I have never used it. I usually get free resources and use them.

**2.22 Lecturer V:** Educational material developed by educationists and freely available on the net.

**2.23 Lecturer W:** Situation where a lot of people are accessing information without incurring cost through buying textbooks.

**2.2: What OER are you using in your teaching?**

**2.2.1 Lecturer A:** It can be a method. It can be a video material that we can access, and then adapt according to the needs and level of the understanding of students.

**2.2.2 Lecturer B:** I am that's why I am saying that I am encouraging student to create their own teaching aids before they go to school.

**2.2.3 Lecturer C:** I am using videos.

**2.2.4 Lecturer D:** Yes, I upload my own material.

**2.2.5 Lecturer E:** From the context, I am not sure if the information that I get from the internet is OER.

**2.2.6 Lecturer F:** I am using videos.

**2.2.7 Lecturer G:** I am not yet using OER in my teaching because of the licensing part. We are embarking on exploring the OER further in the project.

**2.2.8 Lecturer H:** Yes, not at the moment. What we are using are the things like maybe YouTube links and things like that. But next year, in the new Honours programme we have prescribed compulsory OER resources.

**2.2.9 Lecturer I:** I am using videos in my teaching.

**2.2.10 Lecturer J:** I am using OER when I am developing tutorial letter for Teaching Practice and if, for an example, my Teaching Practice has 5 lesson plans that have to be developed by students and then in that tutorial letter that they should implement in schools-the fifth one is compulsory that it should be OER that they should download. Let's say they are teaching, writing, reading and spelling, they are allowed to download and align with theirs, especially, those that come from disadvantaged areas so that they can see how to improvise.

**2.2.11 Lecturer K:** I use MyUnisa. I also use resources that are from the library.

**2.2.12 Lecturer L:** I don't teach but use articles in my research.

**2.2.13 Lecturer M:** I am using OER like search engine ERIC.

**2.2.14 Lecturer N:** I am developing a new course which is mainly based on OER academic articles.

**2.2.15 Lecturer O:** I have started moving towards OER. Next year the two modules that I am working on will have OER attached to them.

**2.2.16 Lecturer P:** OER is based on me giving students work. You will find them using it in the library. Sometimes I use video.

**2.2.17 Lecturer Q:** In research, not necessarily in my teaching because in research I will refer students to information from other institutions.

**2.2.18 Lecturer R:** We usually refer students to YouTube videos. We encourage them to use MyTutor for e-learning.

**2.2.19 Lecturer S:** Yes, sometimes I am preparing PowerPoint presentations. I adapt them accordingly.

**2.2.20 Lecturer T:** Yes, I do. I use OER to get information during compilation of tests, examinations and when writing papers. I also use OER to refer to my students.

**2.2.21 Lecturer U:** I usually use MERLOT and Wikipedia.

**2.2.22 Lecturer V:** I am not using it in my teaching but will definitely use it.

**2.2.23 Lecturer W:** I am using OER in my teaching.

**2.3: What OER material are you using in your teaching?**

**2.3.1 Lecturer A:** Yes, I am use OER in my teaching. I use articles that are research products that I feel are valuable in enhancing teaching and learning, especially textual. I haven't used videos in class.

**2.3.2 Lecturer B:** The one for TESSA.

**2.3.3 Lecturer C:** I am not sure about what you mean by OERs. Most of the time I use pictures and videos. I use them when developing study guides and tests.

**2.3.4 Lecturer D:** I am using the Moodle platform.

**2.3.5 Lecturer E:** Videos that I usually get are for free.

**2.3.6 Lecturer F:** I use the internet to access articles that will reflect on a particular topic that I am busy with.

**2.3.7 Lecturer G:** I am not yet using OER in my teaching.

**2.3.8 Lecturer H:** We are not using OER. Currently, I am involved in a module where students use buy textbooks. I will use e-books in the online Honours next year.

**2.3.9 Lecturer I:** I have developed an article and video.

**2.3.10 Lecturer J:** It is OER Africa and TESSA.

**2.3.11 Lecturer K:** I use MyUnisa.

**2.3.12 Lecturer L:** I use journals, e-books, reports and podcasts.

**2.3.13 Lecturer M: I** like Google scholar because it helps us to get learning materials. I also YouTube.

**2.3.14 Lecturer N:** I am using academic articles lately and free resources from Open University. Some publishers do have open access materials.

**2.3.15 Lecturer O**: I have one from SAIDE which is on "What it means to be a teacher" and different approaches to teaching. I have one from Council on Higher Education that I am using. I have three diagrams that I am using as free content.

**2.3.16 Lecturer P:** I rely mostly on videos.

**2.3.17 Lecturer Q:** I am using the library catalogue. I normally use videos on the methodology module I teach.

**2.3.18 Lecturer R:** We use them. We use YouTube when providing further clarity on concepts. We also use YouTube and open textbooks.

**2.3.19 Lecturer S:** I used videos, PowerPoint and everything which is for free.

**2.3.20 Lecturer T:** I use videos from YouTube which I sent to Mytutor

**2.3.21 Lecturer U:** I use articles, books and simulations

**2.3.22 Lecturer V:** I am not using it in my teaching.

**2.3.23 Lecturer W**: It is everything including video.

**2.4: Does the effects of the use of OER in your teaching impact your teaching?**

**2.4.1 Lecturer A:** In instances where there is shortage. Access to internet makes it easy for lecturers and students to access the material. Policy is a starting point to guide in using material.

**2.4.2 Lecturer B:** Students have written books in different home languages generated from TESSA.

**2.4.3 Lecturer C:** There is a lot of materials out there that can be used. There is a need for us to be conscientised on OER.

**2.4.4 Lecturer D:** Moodle has not been long. It's like a process that has to go through. I would like to use more of OER.

**2.4.5 Lecturer E:** As we are moving into a $4^{th}$ Industrial evolution, we need to have technological advancement skills. My job as a lecturer will be easier with OER.

**2.4.6 Lecturer F:** With technology taking the lead nowadays, there is a huge need to use resources that are available to us.

**2.4.7 Lecturer G:** There is a need for more awareness for us to see the benefits of using OER.

**2.4.8 Lecturer H:** There is definitely a need to use. For me, a challenge of the material that we use does not speak to the South African context. It is a process that we are becoming aware of.

**2.4.9 Lecturer I:** Increased active participation of students.

**2.4.10 Lecturer J:** There is a need as long as we download e-books and e-material especially in Odel. It can be reinforced.

**2.4.11 Lecturer K:** More has to be done in the colleges.

**2.4.12 Lecturer L:** We are third world. This is where there is more hunger for education.

**2.4.13 Lecturer M:** The only thing is structural issues like pushing the curriculum.

**2.4.14 Lecturer N:** Well, on the module I am developing, 90% of the articles I am developing are OERs.

**2.4.15 Lecturer O:** I will send all resources to OERs. There is a long way to that. I spend much time searching to get good content.

**2.4.16 Lecturer P:** Our module is broad therefore it assist students to be able to specifically study as per learning outcomes.

**2.4.17 Lecturer Q:** Yes, OER is very helpful because it really allows one to engage deeply in learning. It is just some challenges associated with our campus, such as internet access and WIFI.

**2.4.18 Lecturer R:** We have limited resources.

**2.4.19 Lecturer S**: They can make articles free.

**2.4.20 Lecturer T:** OER are good because anyone who want to reach the source can easily reach the source.

**2.4.21 Lecturer U:** OER are needed because they save time. They also help us to identify the gaps that can be improved.

**2.4.22 Lecturer V:** I believe education is a human right and the vast majority of people need OER to access education.

**2.4.23 Lecturer W:** There is a need for advocacy so that lecturers can be more aware about OERs.

**2.5: What types of OER have you created?**

**2.5.1 Lecturer A:** Writing articles and uploading them on the net.

**2.5.2 Lecturer B:** I am only teaching about classroom management. Classroom management does not use OER that much.

**2.5.3 Lecturer C:** I have not yet created any OER.

**2.5.4 Lecturer D:** I have created one on Moodle.

**2.5.5 Lecturer E:** I don't remember doing that but I always upload materials from the internet into Moodle.

**2.5.6 Lecturer F:** Created? I don't want to say created but maybe downloaded or adapted.

**2.5.7 Lecturer G:** Not yet created OER.

**2.5.8 Lecturer H:** I have created articles and book chapters. However, they are not available as OER.

**2.5.9 Lecturer I:** I have developed video and posted a video.

**2.5.10 Lecturer J:** From my experience not at UNISA but from Fort Hare, is that I wrote a module and those modules are already in OERs in Science and Mathematics.

**2.5.11 Lecturer K:** I have not yet created any OER as I have not yet being trained

**2.5.12 Lecturer L:** I have not yet created any OER as I have not yet been orientated

**2.5.13 Lecturer M:** I have not yet created any OER as am not yet been to a workshop

**2.5.14 Lecturer N:** I have not yet created any OER as am not yet been orientated

**2.5.5 Lecturer O:** I am not sure how to define whether what I created is OER or just a resource for my module. I have not yet opened them up as OER. Our library offer their training.

**2.5.16 Lecturer P:** I haven't created my own OER. We have never been subjected to awareness or workshops.

**2.5.17 Lecturer Q:** I have not yet created any OER as I am still to be trained.

**2.5.18 Lecturer R:** I have not yet created any OER as am not trained.

**2.5.19 Lecturer S:** Haven't created any OER.

**2.5.20 Lecturer T:** Yes, like writing articles that are accessible to students and everyone in the world.

**2.5.21 Lecturer U:** I have not yet created any OER as I am still to be trained.

**2.5.22 Lecturer V:** I have not yet created any OER as am not trained.

**2.5.23 Lecturer W:** Not yet created, that's what we are trying to do.

**3.1: What are the barriers that hampers your reuse and adaptation of OER in your teaching?**

**3.1.1: Lecturer A**: Issues of connectivity. We usually experience power cuts in the institution. Our institution is playing a role through Moodle to encourage the infusion of OER into courses.

**3.1.2: Lecturer B:** In most cases we have challenges of internet access. We don't have a policy on OER. We adopted a programme from University of Johannesburg.

**3.1.3: Lecturer C**: I think it is the internet access in our campus for lecturers and students.

**3.1.4: Lecturer D:** It takes a lot of time to adapt. The other thing is that our students don't have access to the internet. Our internet is very terrible.

**3.1.5: Lecturer E:** Sometimes the policy is prohibiting us as we are not sure about the issues of copyright.

**3.1.6: Lecturer F:** Mostly it will be the availability of the internet and the age of the in-service teachers regarding technical skills.

**3.1.7: Lecturer G:** The licensing part and the strategy does have a problem. The licensing is not catering for individuals but for the institution.

**3.1.8: Lecturer H:** I think being aware of how to access and how to use OER. We are put under pressure to publish in recognised and acknowledged journals. Initiatives like TESSA need to be aware of us. We need workshops on intellectual property.

**3.1.9: Lecturer I:** Lack of knowledge and training.

**3.1.10: Lecturer J:** According to portfolios that we have received, those who have access and those students who don't have access, we discover that they don't use those OER to align the Lesson plan. They just write out their experiences. The barriers are that students don't use although they are asked to.

**3.1.11: Lecturer K:** OER are a hindrance when you have to network, when you cannot have access to resources because they are locked. Resources are licensed.

**3.1.12: Lecturer L:** We are not able to deal with the monopoly of big multinational companies. The bigger monopoly companies are controlling who have access to knowledge. Readily

available OER do not have our context. We are parasites on OER that are already there. We should be creating our own OER**.**

**3.1.13: Lecturer M:** Challenges could be that you get sources which are not licensed by the university and you still have to go back and look for permission to use that material.

**3.1.14: Lecturer N:** I took a lot of time to look for materials have no institutional support. It is a real time consuming process.

**3.1.15: Lecturer O:** Finding OER that match what you are teaching is sometimes not easy. You may find something that is almost fine but you have to modify it. Licensing is also a barrier as you need to navigate considering it.

**3.1.16: Lecturer P:** I don't use much of OER and I don't encounter challenges because I rely not only on that.

**3.1.17: Lecturer Q:** I think it is the structure of the University-the resources-it does not allow me to use such. Accessibility to the internet is a challenge.

**3.1.18: Lecturer R:** I indicated that it is the policy of plagiarism. We normally prepare study guides. You cannot take every information as it is-you have to adapt.

**3.1.19: Lecturer S:** I cannot say there are barriers because I am not yet well versed.

**3.1.20: Lecturer T:** Authenticity of some OER sources. You may find information that you are too sure about their validity.

**3.1.21: Lecturer U:** Copyright issues are hampering the use of OER.

**3.1.22: Lecturer V:** Even if I have my known, before and I think it will be internet access in our campus.

**3.1.23: Lecturer W:** Students from diverse backgrounds who have no technical skills to use MyTutor.

**3.2: What are those factors that you think will motivate you to increase your OER creation?**

**3.2.1: Lecturer A:** More training and staff development workshops. Workshops on how to develop different study material.

**3.2.2: Lecturer B:** First of all, our university is still at an initial stage of developing a policy. -If OER policy can be one of our policies. Secondly, the issue of internet access needs to be given special attention.

**3.2.3: Lecturer C: I haven't been thinking about increasing my your creation**

**3.2.4: Lecturer D:** A basic course to develop your own site.

**3.2.5: Lecturer E:** More training on the accessibility that will allow lecturers to have access at home.

**3.2.6: Lecturer F:** I guess I will be motivated by the support system.

**3.2.7: Lecturer G:** First we need to be empowered to create our own OER. Those that I came across don't suit our context. We need to first get the skills to create OER.

**3.2.8: Lecturer H:** There is a need for more sessions on how important it is. There are more sessions on how to overcome intellectual property issues.

**3.2.9: Lecturer I:** Training, skills and knowledge.

**3.2.10: Lecturer J:** It is influencing, if for instance, I have a certain theme I haven't created.

**3.2.11: Lecturer K:** If our Information Technology unit or in the library and colleges buy materials. The availability of such materials in the library through Information Communication Technologies.

**3.2.12: Lecturer L:** From my personal point of view and as a Head of UNESCO, I am driven by pro-poor policies. Knowledge is power.

**3.2.13: Lecturer M:** If we can have more time for creativity in our lesson planning. We also need training seminars on the use of OER. Seminars and workshops will also assist a lot.

**3.2.14: Lecturer N:** I am well motivated because OER are accessible to students and there is no costs involved. **OER** creation enables a variety in the article that draw some standardised textbooks from major publishers.

**3.2.15: Lecturer O:** I will ask my students how they feel about OER. Their respond will probably motivate my OER creation. I need to check if I need training or explore the database more.

**3.2.16: Lecturer P:** I am not yet involved in OER creation as I am yet to be orientated.

**3.2.17: Lecturer Q:** If the University can provide us with a strong WIFI whereby we can access the internet in the classrooms. If internet accessibility can be provided.

**3.2.18: Lecturer R:** I am teaching Mathematics and then Mathematical concepts are universal. So you cannot claim to be owning them. If publishers can relax their copyright laws.

**3.2.19: Lecturer S:** To expand my knowledge and introduce my students.

**3.2.20: Lecturer T:** I think subsidies on data will help lecturers and students. Accessibility to technology, instead of taking all NSFAS money to buy textbooks. We should buy tablets for students. We should also provide technological skills to lecturers and students on how to use OER in teaching and learning.

**3.2.21: Lecturer U:** We need to learn a lot from other people and also encourage us to check other people's work.

**3.2.22: Lecturer V:** It could be a very rich source that could help the disadvantaged students.

**3.2.23: Lecturer W:** Once this challenge of WIFI is sorted, and if students are given tablet, this will help to increase my OER use.

**3.3: In what ways do you feel your OER creation is influencing your course development?**

**3.3.1: Lecturer A:** OER expands my knowledge in course development.

**3.3.2: Lecturer B:** It is very good because after TESSA came this side, it assisted students to create their own storybooks.

**3.3.3: Lecturer C:** They strengthen my course development as I don't have to start things from scratch.

**3.3.4: Lecturer D:** A lot of information can be shared with students and that saves time.

**3.3.5: Lecturer E:** To be honest, OER influence in a positive way. For example, when you incorporate a video into your teaching.

**3.3.6: Lecturer F:** The OER creation I engage in the more the influence my course development

**3.3.7: Lecturer G: My** course development is not influenced by OER.

**3.3.8: Lecturer H:** My course development involves some material that I took from the internet. We use textbooks that I supplement by OER.

**3.3.9: Lecturer I:** I don't see how course development can be influenced by OER, but they definitely do.

**3.3.10: Lecturer J:** We should emphasise our tutorial letters, as much as we can. I have created that. I think a workshop is needed for reskilling.

**3.3.11: Lecturer K**: My course development is a little bit influenced because we have jRouter which we use for marking or assessment.

**3.3.12: Lecturer L:** I don't create OER as I haven't been orientated yet.

**3.3.13: Lecturer M:** The whole will be linked to the curriculum itself. Course development and design will assist me in coming out with the best material.

**3.3.14: Lecturer N:** I used OER in my course development to align my assessment activities with the current assessment methods

**3.3.15: Lecturer O:** Creating resources for my course helps me to be in touch with my students.

**3.3.16: Lecturer P:** My module is a skill-orientated course.

**3.3.17: Lecturer Q:** When I prepare study guides, I need access to get information that I will use in my teaching. For example, on-line platform to purchase content for that particular module.

**3.3.18: Lecturer R:** It can help my course development by enabling me to benchmark with other universities

**3.3.19: Lecturer S:** I am not yet an OER creator

**3.3.20: Lecturer T:** I don't have evidence to support that my course development is OER-orientated.

**3.3.21: Lecturer U:** It will enable my course development to be reviewed and therefore improved.

**3.3.22: Lecturer V:** OER I not influencing my course development.

**3.3.23: Lecturer W:** One of the challenges at this campus is the availability of Wi-Fi. Instead students still buy textbooks which could be replaced with the use of tablets.

**4.1: Which models are you implementing for re-use and adaptation of OER in your teaching?**

**4.1.1: Lecturer A**: I am not aware of any models.

**4.1.2: Lecturer B:** No, we don't have models

**4.1.3: Lecturer C:** I don't know of any.

**4.1.4: Lecturer D:** Creative Arts, Performing arts, Technology, Natural Science, Physical education. In my first Art lesson, I use local Art. I bring Art gallery to them on OER.

**4.1.5: Lecturer E:** I don't know of any model.

**4.1.6: Lecturer F:** I don't know any model on OER.

**4.1.7: Lecturer G:** I am still at that stage where I am capacitating myself. Whose OER am I going to use and what was the aim of creation.

**4.1.8: Lecturer H:** I am not creating at the moment.

**4.1.9: Lecturer I:** I am not aware of any model.

**4.1.10: Lecturer J:** There is no model that I follow.

**4.1.11: Lecturer K:** I don't know of any model on OER.

**4.1.12: Lecturer L:** To be frank with you, the strategy which is in place will initiate the models.

**4.1.13: Lecturer M:** No, I don't know of any models

**4.1.14: Lecturer N:** I don't know of any models. We don't have a policy that prescribes any model.

**4.1.15: Lecturer O:** I will say it I will probably start next year

**4.1.16: Lecturer P:** I am not sure about the models.

**4.1.17: Lecturer Q:** No, currently I don't know of any model.

**4.1.18: Lecturer R:** Currently, I don't know of any model.

**4.1.19: Lecturer S:** I don't know models on OER.

**4.1.20: Lecturer T:** OER is not clear to me.

**4.1.21: Lecturer U:** I am not sure about models

**4.1.22: Lecturer V:** I am not sure about models.

**4.1.23: Lecturer W:** We don't know about OER models.

**4.2: What is your view regarding the use of OER models at your institution?**

**4.2.1: Lecturer A:** There is no existing OER model.

**4.2.2: Lecturer B:** There will be a challenge if we have a model on OER because it will benefit everyone.

**4.2.3: Lecturer C:** It will be a very useful thing to have because the model will guide us.

**4.2.4: Lecturer D:** To a little extend, it is a bit behind.

**4.2:5 Lecturer E:** Non-existence of models is affecting us.

**4.2.6: Lecturer F:** I don't know any.

**4.2.7: Lecturer G:** Like I indicated earlier was that the focus of OER at UNISA was focussed on research. Most of the materials are e-books and journal chapters. There are few materials on teaching and learning.

**4.2.8: Lecturer H:** We should be made aware in order to make a better selection, and intellectual property.

**4.2.9: Lecturer I:** UNISA is an ODEL institution and it has to do more on raising awareness and showing the staff the importance of OER.

**4.2.10: Lecturer J:** There is no model on OER.

**4.2.11: Lecturer K:** I will say it is happening and it needs more awareness for the academics and students. OER can be wonderful for teaching and learning.

**4.2.12: Lecturer L:** Look, I have a mixed view. OER should be part and parcel of UNISA mandate. UNISA has been slow in operationalising OER.

**4.2.13: Lecturer M:** OER is very helpful because it allows one to engage in teaching and learning.

**4.2.14: Lecturer N:** It is essential for knowledge generation. It is essential for people who are not part of the dominant centre of knowledge production. OER at UNISA is not adequately encouraged yet. It has not yet taken on. Since UNISA serves poor countries, it could become a hub of knowledge as it opens up.

**4.2.15: Lecturer O:** It is an important avenue that we have to look at but we need to be critical as to whether it adds value.

**4.2.16: Lecturer P:** It is the best model if we have time.

**4.2.17: Lecturer Q:** It is a good platform especially now that we are talking the 4$^{th}$ Industrial Revolution.

**4.2.18: Lecturer R:** It should be encouraged and expanded beyond the current borders.

**4.2.19: Lecturer S:** It exposes people to a lot of knowledge. Each institution need to adopt it.

**4.2.20: Lecturer T:** OER awareness is more important. OER are very useful as most PhD students are using OERs. People should be encouraged and provided with skills. I haven't attended an OER workshop.

**4.2.21: Lecturer U:** OER is the best and South African universities must use it.

**4.2.22: Lecturer V:** Very curios to go and research about OER and feels very positive.

**4.2.23: Lecturer W**: OER is the best

## APPENDIX H: CLOSED STRUCTURED INTERVIEW QUESTIONNAIRE

SECTION B**.QUESTIONNAIRE**

**Mark with an ''X"**

SECTION B **Conceptualisation of the use of OER and adaptation by lecturers**

| | | **Strongly Disagree** | **Disagree** | **Neutral** | **Strongly Agree** | **Agree** |
|---|---|---|---|---|---|---|
| | Questions | 1 | 2 | 3 | 4 | 5 |
| 10. | I am currently using OER in my instruction. | | | | | |
| 11. | Video and OpenTextbooks are aspect of OER which have an impact on my curriculum | | | | | |
| 12. | I have the knowledge necessary to use and integrate OER into my courses | | | | | |
| 13. | I prefer to use OER<br>created elsewhere than to<br>use my own<br>materials | | | | | |
| 14. | I have created my own OER material | | | | | |
| 15. | I have revised (re-worked) materials so that they better meet my needs | | | | | |
| 16. | I have redistributed any of the revised or remixed materials<br>with others? | | | | | |
| 17. | I need to increase OER use in teaching. | | | | | |

SECTION C **Policies on the use of OER and adaptation**

| | | Strongly Disagree | Disagree | Neutral | Strongly Agree | Agree |
|---|---|---|---|---|---|---|
| | Questions | 1 | 2 | 3 | 4 | 5 |
| 18. | My college/school of education has policy on OER reuse and adaptation. | | | | | |
| 19. | My college/school of education instructional policies supports on OER have been available to me through workshops, trainings, and instructional design staff. | | | | | |
| 20. | My institution has OER support services | | | | | |
| 21. | OER reuse and adaptation enable me to accomplish course development activities more quickly | | | | | |
| 22. | My institution's OER initiatives enable free access to educational material. | | | | | |

SECTION D **Challenges faced by lecturers in the use of OER and adaptation**

| | | Strongly Disagree | Disagree | Neutral | Strongly Agree | Agree |
|---|---|---|---|---|---|---|
| | Questions | 1 | 2 | 3 | 4 | 5 |
| 23. | I am familiar with licensing and copyright rules and options regarding OER material | | | | | |
| 24 | I am empowered to use and integrate OER into my courses in the future | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 25 | Lack of institutional support is a constraint for the reuse and adaptation of OER | | | | | |
| 26. | I do not have trust on quality assurance process for OER going into the Repository | | | | | |

SECTION E **Views on the models on use of OER and adaptation and OER in general .**

| | | **Strongly Disagree** | **Disagree** | **Neutral** | **Strongly Agree** | **Agree** |
|---|---|---|---|---|---|---|
| | Questions | 1 | 2 | 3 | 4 | 5 |
| 27. | I am familiar with licensing and copyright | | | | | |
| 28. | OER brings much needed effectiveness in teaching and learning practices | | | | | |

## APPENDIX I: LETTER OF LANGUAGE EDITING